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400.01 Introduction

This Division of the *Plans Preparation Manual* provides guidance and instructions for preparing contract plans for WSDOT projects. The contents of this Division can be applied to the majority of the projects designers will encounter. It is understood that no two projects are the same and that it is not possible to provide information for every circumstance that may be encountered. There will be those projects, or portions of projects, that do not fit the standard applications. In those cases, recognize the need to adjust the standards to best depict the work to be accomplished.

This Division shows representative information and examples to use as a basis to make decisions on what is to be included in the Plans, Specifications, and Estimates (PS&E), and how it is to be shown in the plans. The main objective is to assemble a thorough package that contains the precise information required by a contractor to submit a responsive bid and for WSDOT to get an acceptable finished product. Providing too much information can, at times, cause as many problems as not providing enough. Contract Plans need to be biddable, buildable and maintainable. Contract Plans include only that information necessary for the contractor to properly bid and construct (biddable and buildable) a project. Information intended for WSDOT inspectors should not be included, as contract plans are for the contractor, not the engineer. In addition, where appropriate, consolidate and reduce plan sheets. Projects requiring contractor surveying will require more detail and information than a project being surveyed by WSDOT.

400.01(1) **Contract Plans and Provisions**

The Plans, Specifications, and Estimates are some of the documents required for the advertisement of a project.

The Contract Plans and Contract Provisions must set forth the work in a clear and concise manner to avoid misinterpretation.

The Contract Plans are to conform to the geometric design as documented in the Design Approval (DA), the Project Development Approval (PDA) package, and the Design Documentation Package (DDP). (See the *Design Manual* Chapter 300 for more information.) All plan details and Contract Provisions are to be specific to the project being developed. It is acceptable to use details and provisions from previous contracts. They should be examined closely and modified as required to ensure they are specific to the current project.

Deviations from Washington State Department of Transportation (WSDOT) policies and standard practices require approval by the appropriate approving authority, in accordance with the [Design Manual](#), well in advance of advertisement of the project, during project development.

Coordinate design schedules early with all specialty groups involved with the project. Involve the Headquarters (HQ) Bridge and Structures Office when structures are involved to ensure the project will be completed in a timely manner. Real Estate Services and Environmental are also critical to meeting project ad dates. Understanding specialty groups schedules, to incorporate into your project schedule is of vital importance.

Avoid duplication within the Contract Plans and Provisions. Information that is contained in the Contract Plans does not belong in the Provisions. Information that is contained in the Provisions does not belong in the Contract Plans.

Reduce the volume of the plans by using logical combinations of plan series to best display the information. Displaying unnecessary or duplicative information may cause confusion during bidding, resulting in higher bid prices. A series of plan sheets with minimal information, makes it difficult to coordinate different items of work. This could also lead to increased prices by bidders estimating the project. Complete and accurate information on the correct series of plan sheets is what creates biddable and buildable contract plan sets.

Standards are not developed to stifle design, but to provide consistency across the state. We strive for consistent use of state standards, regardless of where the project is located. We also recognize that unique situations may require varying from the standards. When standard materials are called for, the contractors and the suppliers know what is needed and what to expect for testing and approvals. When the same work is specified and represented in the plans the same way, the contractors develop an understanding of our expectations. Using standard items and construction methods is almost always more economical. Proprietary items should be avoided unless there is proper justification.

Review guidance and checklists

Use the [Plans Preparation checklist](#) to organize and ensure items required for the project are included.

For reviewing items needed for your completed project, use the [Plans, Specifications and Estimates checklist](#). This checklist contains the type of information that will be examined during the Stewardship Process Review, conducted by Headquarters and the Federal Highway Administration (FHWA) at the end of the project.

Contact your Region Plans office for a region-specific checklist.

400.02 Project Manager's Responsibilities

All projects must have formal approval action in order to be advertised working with your region Plan Review Office. Refer to the Appendices of the *Advertisement and Award Manual* for a sample of the Memorandum "Approval for Advertising – HQ Ad & Award."

400.02(1) General

The Project Manager has the following responsibilities (this is not an all-inclusive listing):

1. Prepare the PS&E in the basic format presented in this manual and in accordance with the geometric design documented in the Design Approval (DA), the Project Development Approval (PDA) package, and the Design Documentation Package (DDP). (See the *Design Manual* or contact your region Assistant State Design Engineer for more information.)
2. Obtain permits, approvals, clearances, and certifications for which the region is responsible, working with your region subject matter experts and specialty groups. The PS&E is to reflect the contract-relevant requirements of these documents.
3. Set up an Environmental Commitments Meeting to understand and achieve the requirement in (b) above. This should include the Region Environmental Office as well as the Construction Project Engineer administering the contract.
4. Provide and maintain accurate bid item quantities, reasonable and current unit prices backup data used to determine the estimated cost for lump sum bid items, estimated (EST) and calculated (CALC), and bid items that have little or no historical cost data. Tools to assist with unit bid prices are the Unit Bid Analysis website and database and the program "Bid Tabs Pro" for current bid prices at:
<https://wsdot.wa.gov/engineering-standards/design-topics/engineering-applications/technical-support-guidance>.
5. Maintain the cost of the project within the budgeted amount. Address budget issues through the appropriate authorities as warranted.
6. Ensure the aggregate total cost of State Force Work and state-supplied materials are in accordance with [RCW 47.28.030](#) and [RCW 47.28.035](#) (see Division 7).
7. Determine the sources for materials and locations of sundry sites furnished by WSDOT to verify the quality and quantity of material available at the provided sources.
8. Verify that required new right of way, including permanent and temporary easements, will be secured prior to the need to occupy the property.
9. Coordinate the HQ Bridge and Structures Office PS&E preparation with the region PS&E preparation. Provide the HQ Bridge and Structures Office with design and bridge site data in a timely manner.
10. Ensure the reviews by the region, specialty groups and the appropriate Headquarters offices have been completed. Ensure the title block in the PS&E has the correct first name and initial and last name of the personnel, the design team has returned a brief written response

- to all review comments, and all appropriate changes have been incorporated into the PS&E prior to advertisement.
11. Coordinate activities and review for projects on National Forest System land in accordance with “Highways Over National Forest Lands,” a Memorandum of Understanding (NFS 00-MU-11060000-040) between WSDOT and the USDA Forest Service (USFS), Pacific Northwest Region.
(see: <https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/highways-over-national-forest-lands>)
 12. Provide a memorandum, with written justification, to the appropriate regional authority for the approval and use of all proprietary items (see Division 7 and *Design Manual* Chapter 300).
 13. Provide a memorandum, with written justification and estimated costs to use state-furnished materials, state labor, a mandatory materials source, and/or a mandatory waste site to the correct approving authority in accordance with the *Design Manual* (see Division 7).
 14. Coordinate with the region (Utilities Engineer, Right of Way, and so on) to obtain written construction permits and easements for work to be performed outside WSDOT right of way.
 15. Coordinate with region permitting offices (Utilities Engineer, Right of Way Engineer, Highways and Local Programs, Environmental, and so on) to obtain all required agreements to perform work under the contract for governmental agencies, private companies, and private individuals. These agreements must include how the work is to be funded. Provide substantiation that the benefit derived from the work is equal to or greater than the cost to WSDOT. Ensure all applicable local/state/Tribal/federal laws and regulations have been addressed for the project.
 16. Provide justification and obtain approval from the Transportation Data, GIS, and Modeling Office (TDGMO) for liquidated damages, including interim damages other than those specified in the *Standard Specifications for Road, Bridge, and Municipal Construction* (*Standard Specifications*) (see Division 1).
 17. Provide justification and obtain approval from the HQ Construction Office for incentive/disincentive pay and liquidated damages that revise Section 1-08.9 of the *Standard Specifications*.
 18. Provide justification for stockpiling materials for use on future construction contracts.
 19. Provide justification for not using all pipe alternates (consult the *Hydraulics Manual*.)
 20. Provide justification for the use of construction engineering percentages different from the percentages specified in Division 8.
 21. Ensure the project title on all deliverable documents exactly matches the latest official title as agreed to by the Region Program Management Office and the Region Plans Office at the time of their delivery. If for some reason the scope of the project has changed so dramatically that the official project title must be changed, the title change must be

- negotiated with and agreed to by the Region Program Management Office and the Region Plans Office. Also confirm that the Federal Aid number is consistent on all PS&E documents.
22. Provide justification and obtain approval from the HQ Construction Office or current delegated authority in each region for use of nonstandard time for project completion specifications.
 23. Provide justification and obtain early endorsement, then approval from the HQ Construction Office Assistant State Construction Engineer for using project-specific specifications that alter the *Standard Specifications* or revise, delete, replace or supplement any General Special Provisions (GSPs) or any Region General Special Provisions beyond the fill-ins.
 24. Coordinate early with the Region Traffic Office on the preparation of all signal, illumination, ITS, and other design elements needed to be incorporated in the PS&E preparation.
 25. Ensure the Contract Plans/Contract Provisions are stamped in accordance with WSDOT Executive Order E 1010, Certification of Documents by Licensed Professionals, and [Appendix 2](#), Applying Professional Stamps.
 26. Check the current [Design Documentation Checklist](#) and [Project File Checklist](#) for additional reports or requirements that apply to the project.

400.02(2) Alterations to Plans and Project Specifications

Alterations to plans or specifications should be performed and sealed by the person who originally sealed them. They may be performed and sealed by a different licensed professional acting within their area of expertise if necessary. Licensed professionals who sealed the original documents shall be notified of changes to their work that are considered practice of engineering and shall be given an opportunity to review and comment, if possible. Licensed professional engineers who are no longer WSDOT employees or who are not available through a consultant services agreement need not be notified of changes to their work.

Changes regarding quantities, payment estimates, timelines, etc., are typically not considered technical changes or practice of engineering and therefore would not require sealing by a licensed professional. Changes not considered technical changes or practice of engineering should still be reviewed by the original designer/submitter of that item of work and should not be changed by the Project Manager without the specific permission of the original designer/submitter.

400.03 Headquarters Assistance/Review

Various offices of expertise are available for assistance if requested by the region. For examples of transmittal memos to Headquarters or region support offices, contact your Region Plans Office for assistance.

- (a) Many of the key Headquarters offices that are available to assist during PS&E preparation are listed below.
 1. Development Division

- Design Office
 - Bridge and Structures Office
 - Cost Risk Assessment (CRA)
 - Design Policy
 - Design Standards (*Standard Plans*)
 - Design Training
 - Environmental Services Office
 - GeoMetrix Office: [Computer aided engineering | WSDOT \(wa.gov\)](#), [ROW Plans, Survey Monument Database \(wa.gov\)](#), and [Visualization services | WSDOT \(wa.gov\)](#)
 - Highway Limited and Managed Access Control
 - Hydraulics
 - Printing Services
 - Project Management
 - Real Estate Services Office
 - Right of Way Plans
 - Roadside and Site Development
 - Strategic Analysis Estimating
 - Utilities, Railroad, and Agreements
 - Value Engineering
2. Construction Office
 3. Transportation Operations Division
 4. Materials Laboratory
 5. Maintenance and Operations
 6. Office of Equity and Civil Rights (OECR)

The HQ Office of Equity and Civil Rights (OECR) is the External Civil Rights Office, which provides some of the following services, which are important in PS&E preparation and contract administration:

- Implement the On-the-Job Training (OJT) programs under the Training Special Provisions (TSP) of USDOT-assisted construction contracts.
- Implement the Disadvantaged Business Enterprises (DBE) program on USDOT-assisted contracts and procurements.
- Set annual DBE goals.
- Establish and monitor a DBE Supportive Services program.
- Implement the Minority and Women Business Enterprise (MWBE) program on state-funded contracts and procurements.
- Provide training and technical assistance to WSDOT and its subrecipients, as well as to contractors and consultants.
- Develop and revise program implementation plans.
- Investigate external civil rights complaints.

- Implement the Title VI program, which requires nondiscrimination by recipients of federal financial assistance.

Contact the [OECR](#) to establish DBE goals, obtain Special Training hours, and determine which WSDOT General Special Provision (GSP) is needed for your project.

<https://wwwi.wsdot.wa.gov/about-us/offices-divisions/office-secretary/office-equity-and-civil-rights-oecr>

7. Capital Program Development and Management Office (CPDM)

- CPDM establishes and manages project control and management procedures, including the change management process and the execution procedures for authorization of work order expenditures (WOA).
- CPDM builds and manages WSDOT programs for future biennia. They establish program and subprogram funding levels and the process for federal-aid project authorizations. Work through Region Program Management offices regarding these processes and requests.

(b) Find resources to support development of contract plans, specifications, and estimates.

Engineering standards: [wsdot.wa.gov/engineering-standards](https://www.wsdot.wa.gov/engineering-standards)

Manuals & standards: [wsdot.wa.gov/engineering-standards/all-manuals-and-standards](https://www.wsdot.wa.gov/engineering-standards/all-manuals-and-standards)

- Technical Manuals; Project delivery memos; Standard Specifications, General Special Provisions (GSPs)
- Standard plans and Plan sheet library

Design: [wsdot.wa.gov/engineering-standards/design-topics](https://www.wsdot.wa.gov/engineering-standards/design-topics)

- Bridges & structures; Environment; Hydraulics, hydrology; Right of way and Access Control; Utilities, railroads & agreements; Traffic guidance.
- Design ADA
- Design tools & support

[wsdot.wa.gov/engineering-standards/design-topics/design-tools-and-support](https://www.wsdot.wa.gov/engineering-standards/design-topics/design-tools-and-support)

Design Policy and guidance; Standard Plans and drawings; Specifications; Proprietary items, plans review guidance and checklists.

- Engineering applications

[wsdot.wa.gov/engineering-standards/design-topics/engineering-applications](https://www.wsdot.wa.gov/engineering-standards/design-topics/engineering-applications)

- Technical support and guidance for InRoads, OpenRoads, MicroStation, ProjectWise, and Survey.
- Software & resource updates
- Quantity tabulations application
- Unit bid analysis

Construction: <https://wsdot.wa.gov/engineering-standards/construction>

- Materials resources; Qualified Products List.
- Construction guidance; Construction Bulletins and Construction Manual.

Project management:

 wsdot.wa.gov/engineering-standards/project-management-training/project-management

- Project delivery method selection guidance
- Cost risk assessment; Value engineering
- Project management guide

WSDOT Specialty groups

This online resource provides more information about specialty groups.

[WSDOT Project Development specialty groups \(wa.gov\)](#)

400.04 Drafting Requirements

400.04(1) General

How the plan information is displayed on the plan sheets impacts the usefulness of the plans. To get the best possible bid and the best possible finished product, the plans must present the information clearly and concisely. Everyone who examines the plans should be able to determine what work is required and arrive at a single interpretation of the information.

To ensure a clear and singular interpretation:

- Avoid overcrowding of plan sheets by displaying only information relevant to the plan series.
- Draw the plans with appropriate drafting standards as specified in this manual and the [Electronic Engineering Data Standards Manual](#).

Determine what information is required for the contractor to bid and construct the project and for WSDOT to administer the project. The requirements of other readers such as FHWA and various Headquarter offices also need to be considered. Many of the requirements in this manual, such as “Begin Federal Aid” and “End Federal Aid” Number and Section Lines shown on the Vicinity Map, may not be required to construct or administer the project but have value to other users of the Contract Plans.

Determine what information does not add value, creates clutter on the plans and confusion for the reader. Following are some examples of information that **should not** be included in plan sheets and some ways to help eliminate excess plan sheets:

- Alignment and R/W Plans where no changes in alignment and R/W are planned or where the alignment and R/W staking is being conducted and maintained by WSDOT.
- Quantity Tabulations for all items of work or where only a few items of work are listed.
- Right of way lines that have no ties add no value. If right of way needs to be shown, it should have ties showing where it is.

- Future alignments that have nothing to do with construction of the project can clutter a plan sheet making it hard to find the needed information.
- Showing existing pavement markings on Paving Plans or Pavement Marking Plans.
- Repeating plan sheets just to keep the same number of sheets in each series. Use break lines to eliminate sheets of nonchanging information. If there is no drainage code on a Drainage Plan sheet, the sheet shouldn't be included in the series. Also, for Paving Plans and Pavement Marking Plans, if nothing changes between intersections or interchanges, use break lines to eliminate sheets.
- Whenever possible, avoid the practice of cross-hachuring, patterning, or shading of large areas to represent areas to be paved, planed, or anything else. The roadway sections should adequately show the areas to be planed and paved. The use of large areas of cross-hachuring could hide or detract information being displayed on the sheet.
- Profile sheets showing overlay, grinding and inlay, or paving exception areas of the project add no value. Show only the portions of the project that have a change in the vertical alignment of the roadway under construction. In the same way repeating information already shown on roadway sections on paving plans adds no value to the contract.

If it does not provide needed information or add value to the plans—*REMOVE IT!*

The following section provides general rules for showing dimensions and data on contract plans.

400.04(1)(a) Displaying Dimensions and Data

Our engineering applications produce roadway designs to high levels of precision. This is beneficial in design; however, these levels of precision are often unnecessary in construction.

This section provides general information for displaying dimensions and data on contract plans. Generally, show a dimension, station, offset, etc. only to a level of precision being sought and avoid adding decimals or extra trailing zeros when it is not necessary. This represents a more achievable, constructible level of precision to the contractor.

Understanding that there will be exceptions, apply the following basic rules for displaying dimensions and data on plans.

Roadway Sections

- Horizontal elements, lane and shoulder widths – show in feet. If a horizontal dimension is to the nearest foot, then display the dimension as a whole number.
Examples: an 11-foot lane is shown as 11' not 11.0'. If the lane width is 11.6', then show as such; do not round it to 12'.
- Station limits – Design the station limits to the nearest foot when practicable. However, if the roadway section goes to a bridge seat, use the bridge seat stations, matching the bridge plans, which often is to the hundredth of a foot (2 decimal places).
- Materials depths – generally shown to hundredth of foot, as in: 0.25'

Plans

Alignment Plan or Alignment/Right of Way Plan (Also see Section 400.06(9))

- Stations and offsets – Use the precision of the best information. Trailing decimal zeroes may be omitted. As an example: if a Right of Way (R/W) offset is at Station L 14+00.00 with an offset of 60.00' they may be shown as L 14+00 at 60'. Do use the precision you have. If the offset is 59.99', use the 59.99' do not round it to 60'.
- Horizontal control points on plans, including begin and end of project, centerlines, R/W centerline, baselines, and intersections – show in feet to 2 decimal places.
- Display alignment bearings, and delta angles for curve data with the same precision as the best-known information. In other words, if the alignment on the Right of Way plans is the best information, use the data and display the same precision. Alignment bearings, and delta angles need to be the same precision.

Other plan types require less precision

These plans are examples where less precision may be practicable. In these cases, showing stations and offsets to the nearest foot or 0.1 foot may suffice for the contractor to build and place elements.

- Paving plans
- Pavement marking plans
- Signing plans
- Traffic control plans
- Stream plans

Profiles (Also see Section 400.06(12) Roadway Profiles)

- Vertical alignment control points, (BVC, PVI, EVC) stations and elevations in feet to 2 decimal places. Other elevations needed on the sheet should also be in feet to 2 decimal places. Like the elevations of the stations.
- Profile Grades display in percent to as many decimal places as needed, but as few decimal places as possible. Very long grades may need to be as many as 4 decimal places for the math to work for the elevations.
- Drainage profiles proposed flow lines– display stations and elevations in feet to 2 decimal places.
- Manhole tops and grate stations and elevations – display in feet to 2 decimal places.
- Ditch elevations – display in feet to 1 decimal place (to nearest 0.05 when controlled by percent of grade).
- Elevations and stations through each vertical curve on even stations, or if every station adds too much clutter add the elevations to just the even station intervals not greater than 200 feet.

400.04(2) Plan Sheets

Early in the design process, determine the different series of plan sheets that will be required and the information that will need to be displayed on each series.

Using the appropriate levels of the computer-aided drafting and design (CAD) system allows the flexibility to provide additional series of plans easily and quickly if it turns out that more information is required than was originally anticipated. For this reason, it is important that all CAD work use the prescribed level scheme.

- (a) Most of the drawings created by CAD users in a design office are 11-inch by 17-inch plan sheets for PS&E. References will pertain to that size unless otherwise noted. In general, the plotting scale for 11-inch by 17-inch plan sheets is 1 inch equals 100 feet (1"=100'), except as indicated below.

There may be occasions when the scale of a plan sheet needs to be increased to as much as 1"=40' for an 11-inch by 17-inch plan sheet. When this is done, examine the sheet to be sure that required information is easily read. It may be necessary to resize some text or symbols to make them legible.

- (b) Print plan sheets to PDF unless otherwise directed.
- (c) Draw Vicinity Maps at a scale appropriate to the size of the project and the detail required to show the appropriate information, as discussed in 400.06(4).
- (d) Sheets requiring a larger scale to display a great deal of information in a small area should be drawn to an appropriate scale to allow all information to be easily read and understood.
- (e) Draw strip maps at a scale appropriate to display the information clearly.
- (f) Use cross-hachuring only for small, isolated areas of work such as pavement repair areas or butt joint planing locations that may get lost if not displayed in this manner. On occasion, with concurrence of the Region Plans Office, color may be used for clarity. Gray-area shading is typically reserved for use in an addendum to highlight changes to a plan sheet. (See [Appendix 5](#) for Addendum Preparation.)
- (g) All screened (half-toned) portions of plan sheets must be dark enough to adequately reproduce in the typical deliverable PDF format.
- (h) Follow the drafting standards for line weight, lettering height, and symbols for Contract contained in the [Electronic Engineering Data Standards Manual](#). It is important to conform to these standards for consistency and for reproduction.
- (i) Under most circumstances, place lettering and dimensioning so they may be read from either the bottom of the sheet or the right side of the sheet. Do not place text across roadway centerlines or right of way lines. Text is to be clear of all lines and should normally be placed outside the drawing itself. Draw leader lines so they do not cross one another or text. The two exceptions to the bottom and right reading text are:

1. All Section Corner and Township line numbers are to have their tops to the north, and Range Line numbers are to have their tops to the west, regardless of the orientation of north to the sheet.
 2. All information identifying a centerline, such as line designation, stationing, tick marks, and bearings, are to be placed on top of the line and read left to right, with both the top of the line and left to right being based on the direction of the stationing.
- (j) When lines are coincidental, use the following order of precedence for placing them on the sheet:
1. Construction Centerline
 2. Right of Way Centerline
 3. Range/Township Line
 4. Section Line
 5. Corporate Limit Line
 6. County Line
- (k) When Corporate Limit lines coincide with other lines, label the Corporate Limits to clarify that the line is also the corporate limits.
- (l) Provide a north arrow and a scale bar on each plan view sheet. The north arrow will normally be oriented towards either the top or right side of the sheet.
- (m) On all plan view sheets and profile sheets that physically show the Begin Project and End Project headings, identify these points as follows: (Xs are numbers and ?s are letters for a point, like P.O.T.)

STATE FUNDED PROJECTS:

Begin Project	End Project
SR XX, MP XX.XX	SR XX, MP XX.XX
STA XX+XX.XX ??.?.	STA XX+XX.XX ??.?.

FEDERALLY FUNDED PROJECTS:

Begin F.A. No.	End F.A. No.
Begin Project	End Project
SR XX MP XX.XX	SR XX MP XX.XX
STA XX+XX.XX ??.?.	STA XX+XX.XX ??.?.

- (n) If the “Begin and/or End Federal Aid” are different than the “Begin and/or End Project,” display this information similar to the above on a separate leader line drawn to the appropriate location. Use “Begin Construction” and “End Construction” when work is being done on crossroads adjacent to the main line work or at ramp termini.

- (o) Provide a legend on all plan sheets (such as site preparation, roadway sections, drainage, paving, and others) showing features applicable to that series.
1. The legend is to contain all items that are shown on any of the individual plan sheets in that series. For example, if your Drainage Plan series consists of 15 plan sheets, and throughout these 15 plan sheets there are 12 items to be identified in the legend, all 15 of the drainage plan sheets in this series will have a legend that will have all 12 items listed and identified.
 2. It is much preferred to have legends on each sheet that requires a legend, but if a sheet in the series is too crowded to include a legend (rare), add a note to the sheet to tell the reader on which sheet the legend may be found. The preferred method is to refer the reader to the legend on the preceding sheet.
- (p) WSDOT Contract Plans show the slope of a line in several forms, such as ratio (#:#), percentage (#%), and decimal (#.## FT./FT.). When a slope is shown in ratio form in WSDOT plans, it is shown as run over rise, which is opposite of mathematical standards in which a slope is always given as rise over run in ratio and fraction form. In WSDOT plans, a 4:1 slope means that the slope has a 4-foot horizontal run and a 1-foot vertical rise. Some WSDOT manuals further clarify the meaning of a 4:1 slope by adding a post text, such as 4H:1V, to further clarify that there are four units horizontal (run) and one unit vertical (rise). Do not use this method on WSDOT Contract Plans.
- (q) Plan sheets prepared by architects and engineers for building facilities and associated site improvements are exempt from the requirements of the drafting standards described in this chapter. Drafting standards for building facilities and associated site improvements are determined by the Facilities Administrator.

400.05 Plan Sheet Sizes and Layout Format

400.05(1) General Requirements

- (a) Provide the Advertisement set of plans on 11-inch by 17-inch sheets. See the *Electronic Engineering Data Standards (EEDS) Manual Deliverables 7*.
- (b) Assemble Contract Plans in volumes, as specified here and in section 400.06. If the Contract Plans Volume 2 will have more than 225 sheets or Contract Provisions have more than 225 pages, they will need to be separated into additional volumes, with no volume having more than 225 sheets or pages.
- The break for volumes is to be made at a logical point in the package, which may not be at 225 sheets or pages.
 - If a project has 275 plan sheets, and the last 80 are bridge sheets, the logical break would be between the civil sheets and the bridge sheets.
 - If multiple volumes are required for the Contract Provisions, the logical break would be at the end of a main section. For example, break between HOT MIX ASPHALT PAVEMENT and the following main section, CULVERTS.

- Do not place the break in the middle of a section.
- (c) Stamping: WSDOT plans and specifications are to be stamped with a seal, signature, and the date signed. Place the licensee's seal on all plan sheets adjacent to the WSDOT logo. WSDOT has established a statewide process for applying professional stamps to plan sets that allows full electronic delivery. Use Appendix 2, Applying Professional Stamps, to follow the WSDOT method and instructions to apply digital professional stamps to contract plans. This also applies to consultants developing projects for WSDOT. Licensees are directed to WSDOT Executive Order E 1010, [RCW 18.43](#), and [WAC 196](#) (Engineers and Land Surveyors); [RCW 18.08](#) and [WAC 308-12](#) (Architects); and [RCW 18.96](#) and [WAC 308-13](#) (Landscape Architects).
- Design-Bid-Build: The following plan sheets prepared for Design-Bid-Build WSDOT projects are not required to be stamped: Index, Vicinity Map, Summary of Quantities, Structure Notes, Quantity Tabulations, Bar-Lists, TESC sheets, and Traffic Control Plans, Staged Traffic Control, Detour Plans, and Pedestrian and/or Bicycle Traffic Control Plans.
 - Design-Build: For Design documents requiring professional stamps consult Chapter 2 Technical Requirements of the Design-Build contract.
- (d) Number Construction notes consecutively within each plan sheet series. However, only show the construction notes that are applicable to a particular sheet on that plan sheet. Once you have created a construction note 1, it will always be the same for that plan sheet series. Continue sequencing of construction notes consecutively as you add them. DO NOT re-sequence from one plan sheet to the next. Each plan sheet series will have consecutive construction notes. See 400.06(29) Traffic Control Plan for guidance on notes and legends for TCP sheets.

400.05(2) Title Block Information

All plan sheets have a title bar on the bottom of the plan. Fill in the information according to the following instructions:

- PLOTTED BY: The first name initial and last name of the person who created the plot.
- DESIGNED BY: The first name initial and last name of the person who designed the sheet.
- ENTERED BY: The first name initial and last name of the CADD operator who electronically entered the plan.
- CHECKED BY: The first name initial and last name of the design team leader or person who checked the plan.
- PROJ. ENGR.: The first name initial and last name of the design Project Engineer.
- REGIONAL ADM.: The first name initial and last name of the Region Administrator.
- REVISION box: To be filled out when there is a revision made after the Advertisement Date. This is generally for the purpose of issuing an addendum.
 - Give a brief description of the revision that was made.

- DATE: Enter the date in which the revision was made.
 - BY: Enter the initials of the person who made the revision.
- REGION NO.: This is an FHWA number; 10 is for Washington State.
- STATE: This should always be WASH.
- JOB NUMBER: Enter the number used for the Estimate Bid Analysis System (EBASE) that is issued by the Region Plans Office.
- CONTRACT NO.: Leave this field blank.
- FED. AID PROJ. NO.: Enter the Federal Aid Project Number in this block on the first sheet of the plans if there is federal aid in the construction phase of the project. This number can be obtained from the Region Program Management Office. See also Section 400.04(2) (m) and (n) for displaying beginning and ending of Federal Aid Project limits on plans.
- LOCATION NO.: Enter the preliminary engineering work order number.
- PE STAMP BOXES: All plans that are considered final and that will be part of the advertised contract must contain the seal/stamp of the licensee who prepared or directly supervised the work. Preliminary documents—those documents not considered final—shall be stamped by the licensee who prepared or directly supervised the work. For more direction, refer to 400.05(1)(c), Appendix 2, Executive Order E 1010, [WAC 196-23-020](#), and [RCW 18.43](#).
- PROJECT TITLE BOX: This is the upper portion of the box that is directly to the right of the WSDOT logo. Enter the exact project name, as determined by the Region Plans Office.
- SHEET TITLE: This is the lower portion of the box that is directly to the right of the WSDOT logo. Enter the sheet name as it appears in the Title column of the Index.
- PLAN REFERENCE: This is the upper portion of the box farthest right on the title bar. This is an alpha/numeric number. The alpha portion is selected by the design team; it should be logical in nature, containing letters that refer to the type of plan. The numeric portion is sequential. The plan reference shall match the Plan Reference No. column of the Index. For suggested Plan Type Codes to be used for plan reference abbreviations, see the *Electronic Engineering Data Standards Manual Deliverables 4*, section D4.04(2).
- SHEET NUMBER: This is the lower portion of the box farthest right on the title bar. This field is filled in on the plans that are advertised when the total number of sheets is fixed. Contact the Region Plans Office for instructions on filling in this field for the review of the plans.

400.06 Volume and Plan Sequence

400.06(1) Assembling Plans

The following outline is the sequence to follow when assembling plans for a construction project. It is a list of possible plan sheets and is not intended to represent a project.

400.06(1)(a) Plan Sequence Volume 1

Volume 1 is to remain unlocked and contain the following sheets:

1. Complete Index.
2. Vicinity Map.
3. Summary of Quantities.

400.06(1)(b) Plan Sequence Volume 2 and additional volumes

This section lists the plan sheet order for Volume 2 and any subsequent volumes if needed.

Note: if Volume 2 will have more than 225 sheets create additional volumes (see section 400.05(1)(b)).

Assemble Volume 2 (and subsequent volumes) following the following sequence. Index is optional.

1. Certification Sheet(s).
2. Borrow, pit, quarry, stockpile, waste sites, and reclamation plans.
3. Roadway sections: main roadway, ramps, frontage roads, detours, others.
4. Grading sections, if applicable.
5. Stage construction plans, if applicable.
6. Alignment or Alignment/Right of Way.
7. Quantity Tabulation sheets (Q-tabs). These sheets will be placed immediately prior to the plan sheets showing the work being tabulated, such as site preparation items, temporary erosion and sediment control (TESC) items, guardrail items, and traffic items.
8. Site Preparation. Existing topography and removal and demolition work may be shown on Alignment Plans; however, if extensive details are required and the plan sheet becomes too crowded, it should be on a separate series.
9. Existing Utilities. This is an extension of the Site Preparation Plan and is only required if the existing utilities are so extensive that they cannot be clearly shown on the Site Preparation Plan.
10. Roadway profiles—normally only required when grade is being revised.
11. Environmental Compliance Plans (ECP) – required for various disciplines that meet regulatory triggers.

12. TESC Plans—may not be required as separate plan sheets if work is minor and can be combined with Drainage Plans or other plan sheets. Refer to Division 7 and the [TESC Manual](#) for information on when a TESC Plan is required.
13. TESC details.
14. Drainage structure notes—will precede plan series showing drainage features.
15. Drainage Plans—may not be required if work is minor and can be combined with another series of plans.
16. Drainage profiles—will follow plan series showing drainage features.
17. Drainage details.
18. Stream Plans.
19. Stream Profiles.
20. Stream Details.
21. Utility Structure Note sheets—only required if there is work to be done by the contractor on existing utilities.
22. Utility Plans—only required if there is work to be done by the contractor on existing utilities.
23. Utility details—only required if there is work to be done by the contractor on existing utilities.
24. Irrigation Structure Note sheets.
25. Irrigation Plans.
26. Irrigation details.
27. Landscape, wetland, rest areas, roadside restoration, and viewpoints.
28. Interchange contours.
29. Paving Plans are required for overlay projects when paving breaks, paving dimensions, intersection paving, taper lengths, dimensions of taper widths, and so on, can't be shown adequately on the roadway sections. In this case, the Roadway Sections, Paving Plans, and Paving Detail sheets are to be prepared in conjunction with each other to show all paving work.
30. Paving details.
31. Curb ramp plans.
32. Minor structures such as retaining walls.
33. Illumination Plans—may be shown on Paving Plans if illumination is minor and Paving Plan will not be too crowded.
34. Illumination details—will follow plan series showing illumination layout.
35. Traffic Signal Plans.

36. Traffic signal details.
37. Intelligent Transportation System (ITS) Plans.
38. ITS details.
39. Sign Specification sheets—will precede the plan series showing the signing.
40. Signing Plans—may be shown on Paving Plans if signing is minor and Paving Plans will not be too crowded.
41. Signing details—will follow plan series showing signing.
42. Bridges and other structures.
43. Building plans and details.
44. Traffic Control Plans.
45. Detour routes and detour signing. If the detour is simple and straightforward, this information may be shown on the Vicinity Map, if the additional information does not detract from the Vicinity Map.

400.06(2) Plan Sheets

Determine the actual plan sheets required to best depict the project. Verify the order of plan sheets to determine what is or isn't required. A basic P1 paver will normally not require as many sheets as a project that has safety, mobility and paving work. When two or more projects are merged into one project, the plan sheet sequence will be followed.

Even with logical combinations of plan sheet series, maintain the following basic order of sheets:

- **Item information:** Quantity Tabulation/Structure Note/Sign Specification.
- **Plan series:** The series showing the items of work described on the Quantity Tabulation/Structure Note/Sign Specification sheets.
- **Details:** For work associated with items shown on the plan sheets.

The following sections provide guidance and links to examples for many types of contract plans.

400.06(3) Index

See Contract Plan [Examples 4-1 and 4-2](#).

An index is required for all projects with 30 or more plan sheets. Provide a complete project index in Volume 1. An index in subsequent volumes is optional.

List the plan sheet titles exactly as they appear on the plan sheets. Avoid sheet titles such as "Miscellaneous Details." If a sheet contains guardrail and drainage details, use "Guardrail and Drainage Details" as the sheet title and in the index.

On small projects, and as scale permits, the index can be placed on the Vicinity Map plan sheet. However, DO NOT reduce your Vicinity Map size to allow you to combine the index and Vicinity Map as one plan sheet.

Regardless of the size of the project, it is recommended that Plan Reference Nos. be used on all projects in lieu of plan sheet numbers during the design phase.

Plan sheet numbers are not critical during the design phase of the project. Until the design team leader or region plans reviewer has all the plan sheets for all the separate series (such as paving, drainage, and signing) to be included in the project, the total number of plan sheets to be included in the contract is unknown.

There are several advantages to using Plan Reference Nos. to identify plan sheets for individual series during the design phase:

- You do not have to know the total number of plan sheets included in the contract.
- Once Plan Reference Nos. have been assigned to individual plan sheets included in a series, these numbers should not have to be changed. This makes referencing details on other plan sheets easy to do and should help eliminate the habit of forgetting to do this. Once the statement “FOR DETAIL, SEE SHEET D12” is placed on the plan sheet, this reference will almost always be correct unless plan sheet D12 is deleted from the contract.
- Plan sheets can be inserted or deleted within the series with slight modifications to reference number. For example, a plan sheet that needed to be inserted between D6 and D7, sheets D7 through the end of the series would need to be renumbered. The use of D6A should be only used in an addendum. (See Appendix 5 for additional information.)

400.06(4) Vicinity Map

See Contract Plan [Examples 4-2, 4-3, 4-4, 4-5, and 4-6](#).

Every project will have a Vicinity Map plan sheet that shows and labels all construction centerlines, detours, and haul routes. Consider also using a state or Region map with the project area pointed out to help show where the project is located.

Projects may be broken into Sections (see Contract Plan Examples 4-4 and 4-5) when it is required or necessary to split the project into different areas.

This is the logical way of showing the work to be performed, listing quantities, and so on, when all the work involved is not conveniently located in one continuous area with no exceptions or gaps.

If the entire project is on one State Route (SR) but has breaks in the areas where work is to be performed between the Begin Project and End Project, label these breaks “exceptions” or “exception areas.” If there are numerous exceptions or exception areas, an alternate method of showing these exceptions is to label them as “Sections” for the areas where work is to be performed.

If the project is on multiple SRs where the work is spread out, it is highly recommended that the work be broken into Sections. When multiple SRs are used in a title, use the smallest SR number followed by et al. to shorten the title.

AN IMPORTANT REMINDER

If the project is broken into Sections, make sure all references to a Section are exactly the same throughout all plan sheet series (Summary of Quantities, Roadway Sections, Quantity Tabulation sheets, Structure Note sheets, Profile sheets, and so on) in the plan set for that Section. Show all exception work areas and gaps identically in all locations and references throughout the Contract Plans and Provisions.

Show the following on the Vicinity Map when applicable:

- (a) Project limits, referenced to State Route Mileposts (SRMP) based on the State Highway Log.
- (b) Stationing at the Begin Project and End Project on the main line and the Begin Construction and End Construction for secondary crossroads.
- (c) The Begin Project and End Project are defined as follows:
 - For projects with one applicable State Route, the beginning and ending of any permanent work on the main line highway is assigned as Begin Project and End Project.
- (d) If the project includes multiple SRs, there is still only one Begin Project and End Project location. Projects with multiple SRs may have a Begin Project on one SR but an End Project on a different SR. Assign Begin Project to the beginning of permanent work at the most westerly or southerly portion of the project, and the End Project to the most easterly or northerly portion, determined by the general direction of the project activities.
- (e) Begin Construction and End Construction are defined as follows:
 - The limits of permanent work, such as signing, guardrail, striping, drainage, landscaping, and so on, to be performed on city, county, or state roadways not on the project main line, included in the contract.
- (f) The Begin and End of Federal Funding with referenced by Federal-Aid Number, milepost, and stationing. The federal funding limits will most often be the same as the project limits, but will cover all work.
- (g) All equations and exceptions on the Vicinity Map. If the scale of the Vicinity Map is such that equations can be shown with headers and leader lines to the approximate point where the equation is located (by stationing), this is the preferred method to identify the equation. If there is insufficient room on the Vicinity Map itself (because of scale) to clearly identify the equation and exception areas, they may be shown in tabular form (data box) on the Vicinity Map plan sheet.
- (h) The distance in miles from the beginning of project (Begin Project) to the nearest city or town and in the opposite direction from the other end of the project (End Project) to the nearest city or town. Do not use “local” descriptions such as “10 miles to EZ Corners.” If the nearest city or town is shown on the WSDOT highway map, it should be familiar enough to be used for this purpose. Use the destination arrow with a mile value. The city or town is to be one that is shown on the [State highway map](#).

- (i) The overall layout of the main line, ramps, frontage roads, county roads and city streets if they are important to the project. Do not show county roads and city streets just to “fill up” the sheet. As with all plan series, delete anything that does not add value to the plan sheet or that provides detail or information that the contractor does not need. **DO NOT LABEL LOCAL BUSINESSES ON THE VICINITY MAP.**
- (j) Scale bar. Select a scale large enough to easily identify all construction lines and appropriate local and private streets or roadways. In addition to including the scale bar, the scale of the plan sheet, detail, and so on, will also be shown in text underneath the scale bar.
- (k) Material sites, waste sites, stockpile sites, and haul routes will be shown. Do not reduce the scale of the Vicinity Map so that these sites can be shown to scale. If they are too far removed from the project to be shown at the scale appropriate for the Vicinity Map, they can be shown in a separate box in a corner of the Vicinity Map sheet at a smaller scale. Show the haul route from the site to the highway, and the distance in miles from the site to the nearest point on the project will be shown or noted.
- (l) Named features such as railroads, waterways, and streams, as well as names of roadways important to the project including overcrossing and underpassing roadways. Include railroads that run parallel to the project, cross the project, or run adjacent to the right of way. Include the name of the railroad. If the railroad crosses through the project, state whether or not the intersection with the rail line is at grade.
- (m) Wetland and wetland mitigation sites are to be shown on the Vicinity Map. Enlarge sections of the Vicinity Map, if needed, to make wetland and wetland mitigation sites visible.
- (n) Identify each bridge found within the Project Limits on Vicinity Map as follows:
- For existing bridges, identify the bridge by bridge number and the type of bridge work. Examples of the most common types of work are: WIDENING, BRIDGE REMOVAL, BRIDGE WIDENING, RAIL RETROFIT, MILL/FILL, CONCRETE OVERLAY, HMA OVERLAY, BST (Bituminous Surface Treatment), NEW APPROACH SLAB, SEISMIC RETROFIT, BRIDGE REPAIR, UTILITY ATTACHMENT, and SIGN BRACKET.
 - When there is no contract work on an existing bridge and the contract work does not affect a bridge, or the work is beyond the end of the bridge (such as guardrail transitions attached to the bridge barrier), then identify the bridge number and include “NOT INCLUDED IN PROJECT” as the type of work.
 - For new bridges, a bridge number is not available at the time of PS&E preparation. Show the project stationing at the beginning of the bridge, and include “NEW BRIDGE” as the type of work.
- (o) Cadastral (Township, Range, and Section) information:
- Identify Township and Range Lines if they fall within the limits shown on the Vicinity Map.
 - If Township and Range Lines do not fall within the limits shown on the Vicinity Map, show the Township and Range information at the top center of plan.

- Section Lines with associated Section Corners, with Section Numbers. On small projects, or larger scale Vicinity Maps, this may require the use of break lines to bring the corners within the limits shown. If the corners are found, show the ties to centerline. If there are no Section Corners within the limits shown, a quarter or sixteenth Section Line can be shown and the cadastral information (Township, Range, and Section) given to indicate location.

(p) Primary control points are displayed in their coordinate location and labeled with the designation ID only (see Example 4-3).

400.06(5) Summary of Quantities

See Contract Plan [Examples 4-7, 4-8, and 4-9](#).

The Summary of Quantities is the last plan series in Volume 1. The Summary of Quantities sheet(s) provides a complete tabulation of all bid items and pay quantities that have been determined to be required for the project. Enter bid items and quantities into the project estimate via EBASE. The Summary of Quantities Plan sheet is generated from the estimate database by requesting a Summary of Quantities report. Utilization of the program [BidTabs Pro](#) provides access to current bid prices for use on the estimate.

Divide the Summary of Quantities into groups and columns within the groups.

400.06(5)(a) Groups

A separate group is required whenever there is a change in:

- Program item number (PIN).
- Program or subprogram (I2, P1, P2, and so on).
- Funding: any change in funding participants, their individual participation rates, or their source of funding. Funding participants may be the FHWA, a state agency or other public agencies, a county, a city, or private organizations.
- Control section.

A separate state-funded group (one per project) is required for third-party damages. The bid item “Reimbursement for Third Party Damage” is included in this group; it will be a minimum of \$5.00 (see the [EBASE User’s Guide](#).)

400.06(5)(b) Columns

Each group is required to have at least one column associated with it.

Additional columns within a group are required for the following:

1. Each bridge and structural retaining wall—those covered in Section 6-11 of the [Standard Specifications](#)— to identify the quantities of work at each wall or bridge during construction activities.
2. Each state-furnished pit site (mandatory or not).

Exceptions allowed for item 1 above: For projects with a single wall, a single bridge, or both, the wall and bridge quantities may be entered into a single column or combined with another column. For projects with multiple walls, if the materials quantities required for each wall are clearly tabulated in the plans, these wall quantities may be entered into a single column or combined with another column in the Summary of Quantities.

In addition, when paving across multiple bridges, the paving quantities need not be separated out for each bridge and may be included in main line paving quantities in the Summary of Quantities.

Use additional columns within groups to show quantity breakouts for individual construction lines. For example, by using separate columns for the main line, a frontage road, and each ramp, it is much easier to track and make quantity revisions during design, and much easier to track quantities for overruns or underruns during construction, than it is if all the quantities are combined in a single column.

400.06(5)(c) Quantities

The quantities for the following types of items will typically appear only in the Summary of Quantities:

- Lump sum items: LS will appear on the Summary of Quantities for these items; the approximate quantity for lump sum items will appear in the Special Provisions.
- Force account items.
- Water.
- Aeration items.
- Structure items, such as bridges and structural retaining walls—although separate Quantity Tabulation sheets are desirable for structural retaining walls when there is more than one wall in a project.
- Borrow materials—unless the conditions noted in Division 7 apply.
- Surfacing materials.
- Paving materials.
- Sign covering.
- Sequential arrow sign.
- Contractor piloted traffic control.
- Traffic control labor.
- Construction Signs Class A.
- Traffic Control Supervisor.
- Traffic control vehicle.
- Spill Prevention Plan.
- ESC Lead.

List bid items in the same order as they appear in the current Standard Item Table.

Intermix bid items not listed in the Standard Item Table according to type of work, with the bid items that are listed.

Bid item names for nonstandard bid items are to be singular in form and close to similar nonstandard bid item names used in previous projects. This information can be found in [Bid Tabs Pro User's Guide](#).

Bid Tabs Pro resource page:

<https://wsdot.wa.gov/engineering-standards/design-topics/engineering-applications/technical-support-guidance>

See *Plans Preparation Manual Division 7* for additional information on standard items.

400.06(5)(d) Standard Item Table

The Standard Item Table provides key information in the right most column (Item Use Message). Listed in this column is a statement that specifies what, if anything, needs to be done if this bid item is used in the project. Some of the statements that are listed in this column are as follows:

STANDARD ITEM

- Indicates bid item is a standard item and is covered in the [Standard Specifications](#). Standard Specification 7-01.5 "Payment" shows standard items can also include fill-ins.
- The "Standard Item Table" will note "Standard Item" in the right most column "item use".
- Decide whether information concerning this bid item, as addressed in the [Standard Specifications](#), is sufficient or whether a "project-specific provision" is required.

REQUIRES SPECIAL PROV.

If one of the following is needed:

- Revise the appropriate section or sections in the [Standard Specifications](#) other than a fill-in.
- Supplement the appropriate section or sections in the [Standard Specifications](#) other than a fill-in.
- Write a "stand-alone" project-specific specification when the [Standard Specifications](#) does not contain: Description, Materials, Construction Requirements, Measurement and/or Payment for an item of work.
- The "Standard Item Table" will note "Requires Special Prov." In the right most column "item use".

STD. ITEM, GSP REQUIRED

- Bid item is a standard item, covered in the [Standard Specifications](#).
- The General Special Provision (GSP) needs to be included in the contract Special Provisions when the "Standard Item Table" notes "GSP Item" in the right most column "item use". Ensure each GSP is applicable meaning "project-specific" to the contract.

GSP ITEM

- A GSP exists for the specific contract type and must be included in the contract Special Provisions. Ensure GSP is applicable or “project-specific” to the contract such as “Use in all projects” or “Use in all Federal Aid Projects.”

REQ. SPECIAL & HQ APPROVAL

- When the “Standard Item Table” notes “Req. Special & HQ Approval” in the right most column “item use,” a project-specific provision must be written, and HQ Construction Office approval must be given prior to including this project-specific provision in the Special Provisions in the contract.

HEADQUARTERS USE ONLY

- Bid item will be included in contracts only when directed by the HQ Construction Office.

TECHNICAL SPECIFICATION

- When the “Standard Item Table” notes “Technical Specification” in the right most column “item use” the bid item requires a technical project specific provision to be written. HQ Construction Office must approve.
- Architects generally write this type of Special Provision. These bid items are typically used only for architectural-type work (such as building facilities construction at ferry terminals and rest areas).

SUPERSTRUCTURE ITEM

- Bid item is to be used in conjunction with Standard Bid Item 4300 ONLY.
- The 9000 series bid items in the “Standard Item Table” notes “Superstructure” in the right most column “item use” are to be used only to provide lump sum breakout data for bid item 4300 “Superstructure – XXXXXX.”

DO NOT use the 9000 series bid items as stand-alone bid items in your contract estimate.

400.06(5)(e) Quantities

Do not duplicate a quantity within the body of the plans. The item totals shown in the Summary of Quantities are to be the sum of the quantities shown for the item throughout the plans. Quantities are typically listed in the Quantity Tabulation, Structure Note, and Profile Plan sheets. When quantities for an item appear in places other than where the contractor expects to find them, or when quantities for an item appear in two or more places throughout the plans, include a cross-referencing statement, such as “FOR ADDITIONAL QUANTITIES – SEE SHEETS Qnn and Wnn.”

Quantities for work items such as pigmented sealer, whose cost is included in the cost of the associated concrete, are shown in the plans for the sole purpose of aiding the contractor in the bidding process and are to be accompanied by the note, “Informational Only.”

When calculating quantities for surfacing and paving materials to ensure reasonable accuracy, the [Design Manual](#) contains units and conversion factors for estimating surfacing and paving quantities.

Quantities listed in the Summary of Quantities are intended to be representative of the work to be performed. Each time a quantity is placed on a Quantity Tabulation sheet, a Profile sheet, or another location in the plans round it according to the following section according to the unit bid price. Show the total of the rounded quantities on the Summary of Quantities.

400.06(5)(f) Rounding of Quantities

Apply the following general rules to the rounding of quantities:

1. **Items having an estimated unit price of \$9.99 or less:** show to the highest multiple of 10; for example, 3,640 (not 3,637) units of haul at \$0.50, and 560 (not 554) tons of ballast at \$1.25.
2. **Items with an estimated unit price of \$10.00 to \$99.99:** show to the nearest full digit; for example, 61 (not 60.5) cubic yards of concrete at \$43.00.
3. **Items with an estimated unit price of \$100.00 or more:** show to one decimal place; for example, 18.3 (not 18.25) acres of clearing at \$1500.00.
4. **Exceptions** to numbers 1, 2, and 3 above:
 - Round earthwork items, roadway excavation, embankment compaction, and borrow excavations to the nearest multiple of 10 units, regardless of price. Round roadway excavation and embankment compaction for each entry on the Profile sheets. Round borrow quantities to the nearest 10 units and place on the Summary of Quantities. On a new construction project with extremely large earthwork quantities, the quantities could even be rounded to the nearest 50 units at each entry on the Profile sheets.
 - Round HMA and crushed surfacing items to the nearest 10 units.
 - Round pipe items to the nearest foot for each pipe run entered on the Structure Note sheets, regardless of price.

400.06(5)(g) Unit Bid Prices

Good sources to use for determining the estimated unit bid prices for quantities are Bid Tabs Pro and Unit Bid Analysis. See the following:

- 🔗 wsdot.wa.gov/engineering-standards/design-topics/engineering-applications/unit-bid-analysis
- 🔗 wsdot.wa.gov/engineering-standards/design-topics/engineering-applications/technical-support-guidance

400.06(6) Certification Sheet

See Contract Plan [Example 4-10](#).

Insert the CERTIFICATION SHEET as the first sheet in Volume 2. Label the first sheet CT1. If there are too many signatures to fit on CT1, then insert sheet CT2, and so on. There is a Certification sheet cell in the CADD resources. See also Appendix 2 Applying Professional Stamps.

400.06(7) Contract Reclamation Plans

See Contract Plan [Example 4-11](#).

A Contract Reclamation Plan will clearly set forth all reclamation work to be accomplished in the contract.

A Contract Reclamation Plan is required for every WSDOT contract that contains a WSDOT furnished-material source. The Contract Reclamation Plan will be based on the Ultimate Reclamation Plan (ultimate REC plan). A reproducible (reverse-reading Mylar) of the approved ultimate REC plan can be obtained from the Region Materials Laboratory. This plan will be modified to create a Contract Reclamation Plan, which will be included in the Contract Plans.

By [RCW 78.44](#), the approved ultimate REC plan must be followed or WSDOT is subject to fines for each incident. If the contract work requires deviation from the ultimate REC plan, a modification to the ultimate REC plan has to be submitted for Department of Natural Resources (DNR) approval prior to beginning work at the site.

In some cases, Contract Reclamation Plans need to be developed during Contract Plan preparation for sites that do not have ultimate REC plans. Materials sources located on federal land or sites smaller than 3 acres in area usually do not have ultimate REC plans.

400.06(7)(a) Contract Reclamation Plan Elements

1. Update the existing contour lines shown on the approved Ultimate Reclamation Plan when to show the topography as it exists immediately prior to the contract. Only the contours in the portion of the site affected by your project need be shown, not for the entire site.
2. Note the contractor's designated work area.
3. Indicate the available raw material, or, when appropriate, add a note on the plan stating that sufficient raw material is available for the project.
4. A block detailing materials to be produced and reclamation items needed under this contract.
5. The interim and reclaimed slopes are to be no steeper than the slopes on the ultimate REC plan.
6. Note specific directions for excavation; for example, "Excavation shall progress to full depth from the existing face of excavation toward the southeast."
7. Only notes on the ultimate REC plan that are applicable to work being performed under the contract are to be included on the Contract Reclamation Plan.

8. Other notes and information necessary to the specific contract will be added. It is the intent that the Contract Reclamation Plan stand alone for the work (reclamation) to be accomplished under the contract.

400.06(7)(b) Contract Materials

Verify with the Region Materials Laboratory that the quantity of available material is accurate and that it is possible to produce all the materials listed within WSDOT specifications. If the contractor will be required to perform some special or extra work to manufacture material that meets the specifications, include the special or extra work requirements in the Special Provisions.

Tabulate quantities for stripping, clearing, and grubbing, and all other items of work to be performed within a site on the plan. For a nonmandatory site, the items of work are to be site-specific (“Clearing and Grubbing – Site QS-A-495”). For a mandatory site, the work will fall under the general contract work item (“Clearing and Grubbing”), but will be shown in a separate column.

Identification numbers for stockpile and waste sites are assigned by the Region Materials Laboratory. Although a Contract Reclamation Plan is not required for stockpile or waste sites, the plans are to indicate any restrictions on the use of such sites.

Show Access to the sites. If an access road is to be built, rebuilt, or widened, indicate the width of right of way, and clearly identify all work to be performed by the contractor on the access roads as a part of the contract. How the contractor will be paid for the access road work will be outlined in the Contract Provisions.

Agreements are required with the owners of all roads that make up the haul route. These agreements will indicate WSDOT’s and the contractor’s responsibilities for returning the roadway to the “before hauling” condition.

400.06(8) Roadway Sections

See Contract Plan [Examples 4-12, 4-13, 4-14, 4-15, 4-16 and 4-17](#).

Roadway sections are to provide complete geometric information on the roadway cross section from the subgrade up and general information left and right of centerline. The information on the roadway sections will tie directly to the Paving Plans and the profiles if these series of plans are included in the project.

On federal-aid projects, show future paving and surfacing depths required to bring the roadway to the ultimate design cross section, in order to qualify for future participation by the FHWA.

Roadway sections are required for every combination of surfacing and paving depths used on the main line, ramps, detours, frontage roads, road approaches, city streets, and so on.

Consider the use of tables below a section to reduce the number of unnecessary plan sheets, such as shown in [Examples 4-15 to 4-17](#).

Roadway sections are to represent conditions from the subgrade up for the entire length of the construction line(s) (such as main line, ramps, detours, frontage roads, road approaches, and city streets) included in the project. Start at the beginning station on an alignment and identify all stationing to the end of line without gaps/overlaps.

When drawing roadway sections, use proportional scaling to indicate lane widths and depths of materials to be placed. A 12-foot lane should be drawn so that it appears slightly larger than a 10-foot shoulder. A 0.15-foot lift of hot mix asphalt (HMA) should be drawn so that it appears approximately one quarter the thickness of a 0.60-foot lift of gravel base course.

For constructability, the following dimensioning guidance is typically considered adequate.

- Horizontal elements, lane, and shoulder widths – show in feet. If a horizontal dimension is to the nearest foot, then show the dimension as a whole number. Example: show an 11-foot lane as 11' not 11.0'. Show an 11.6' lane as 11.6' (do not round it to 12'.)
- Station limits – Design the station limits to the nearest foot when practicable. However, if the roadway section goes to a bridge seat, use the bridge seat station matching the bridge plans, which often is to the hundredth of a foot (2 decimal places).
- Materials depths – generally shown to hundredth of foot, as in: 0.25'

Draw roadway sections to reflect how the work is expected to be performed in the field. If HMA is to be placed in multiple lifts, draw the roadway section to reflect this fact by showing the number of lifts with the required depths of each lift. Show each lift with an edge line that would indicate where each lift would end left and right of centerline. DO NOT simply draw each lift of HMA to extend out into the shoulder unless this is exactly how the HMA is to be placed.

Variable dimensions (for example, Varies 2' to 10') may be used to represent differences in shoulder or lane widths, or transition areas, only if there is a Paving Plan that clearly shows, by stationing, the actual widths desired. If the project is a pavement overlay project and no Paving Plan is going to be provided, the use of variable horizontal dimensions is discouraged unless construction notes or a table is used to describe, by stationing, where the variable paving widths or transitions begin and end. See [Example 4-49](#) of a Paving Plan with dimensions and [Examples 4-15 and 4-16](#) for examples of tables describing lane and shoulder widths.

A generic roadway section for bridges must be provided to avoid having gaps in stationing. If the bridge is being overlaid, additional detail will be required; be sure the roadway section matches any bridge information in the plans. When a project has a structure on the main line or a secondary line that is not included in the project, a paving exception should be noted on the Roadway Section sheet.

Show bridge approach slabs as a separate roadway section.

Station equations, paving exceptions, and project exceptions are to be shown in proximity to the roadway section to which they apply.

400.06(8)(a) Roadway Section Items

Show the following on roadway sections as applicable:

1. Horizontal dimensions of the roadway elements (lane widths, shoulder widths, etc.)
2. Project-specific design details and required features such as curbs, sidewalks, barrier, riprap, etc.
3. The depths of surfacing and paving.
4. Station-to-station limits for each line represented by the roadway section.
5. The position of the construction centerline, the profile grade if new or changing, and the pivot point for super transition.
6. The depth from profile grade to the roadway surface being constructed if the project does not include ultimate design surfacing. Label this depth as "Future."
7. The type, width, and thickness of the existing surface if the characteristics of the existing surface will affect construction.
8. A general note indicating that all surfacing and paving depths are compacted depths.
9. A slope table if embankment and excavation heights vary enough to require different slope rates. Show sideslopes for embankment sections and foreslopes, backslopes for excavation areas, and the existing ground line.
10. A section showing shoulder widening for guardrail. If shoulder widening for guardrail is isolated to one or two roadway sections, it can be shown as part of the particular section. If shoulder widening for guardrail applies to several roadway sections, a separate shoulder-widening section can be drawn and referenced from the applicable roadway sections. Also, a shoulder widening plan view can be drawn for each kind of barrier widening needed for the project and referenced in the roadway sections that show barrier. Widening for things like luminaires can also be shown in this same way.
11. A section showing the shoulder design on the outside of a curve (superelevation section) if the project involves constructing subgrade on the outside of curves (a standard CAD detail that need only be shown once).
12. A surfacing legend on each sheet indicating the type of surfacing material, with the exact item name as found on the Summary of Quantities. For HMA, it is necessary to indicate the class of material used, but not the performance grade (PG), when only one grade is used for the entire project. However, if there are two or more performance grades used on the project, they must all be detailed on the roadway sections. Assign each type of material an identifying number enclosed by a hexagon symbol that is the same on all roadway section sheets.
13. Construction notes numbered consecutively. Only show the applicable construction notes on a particular sheet. Once you have created a construction note 1, it will always be the same for that series. Continue the sequencing of construction notes consecutively as you add them. DO NOT re-sequence from one plan sheet to the next. For example:

- Sheet R1 may have construction notes 1, 2, 3, and 4.
 - Sheet R2 may have construction notes 1, 3, and 5. (Notes 1 and 3 on sheet R2 would be identical to notes 1 and 3 on sheet R1, and note 5 on R2 is a new note, consecutively numbered).
14. If the total paving depth for a class of HMA exceeds the nominal compacted depth specified in the *Standard Specifications*, one of the following methods of indicating the paving requirements will be used:
- Draw multiple lifts on the roadway section indicating the desired minimum compacted depth of each lift.
 - Provide a construction note for the roadway section specifying the number of lifts required and that the maximum allowable compacted depth for any lift shall be in accordance with Section 5-04 of the *Standard Specifications* for Road, Bridge, and Municipal Construction.

400.06(8)(b) Paving Depths

The plans supersede the *Standard Specifications*. If the roadway sections do not indicate the maximum paving depths, the contractor could use thicker paving lifts than allowed in the *Standard Specifications*. Using one of the two methods above ensures the maximum lift thickness will not exceed the requirements of Standard Specification [Section 5-04.3\(7\)](#). If the total paving depth is less than the maximum nominal compacted depths shown in the *Standard Specifications*, the use of the two methods above is optional.

Lifts need to comply with minimum lift thicknesses in addition to maximum lift thicknesses. Minimum lift thickness for each class of HMA are found in Section 8.2.3 of the WSDOT Pavement Policy available here:

 <https://wsdot.wa.gov/engineering-standards/construction-materials/pavement-design-management>

400.06(9) Grading Sections

See Contract Plan [Example 4-18](#).

These plan sheets show items such as: types of embankment; use of waste in slope flattening; drainage layers; composite sections; relief ditch details; slope tables; unsuitable stripping depth tables; controlled blasting slopes; wetland sections; horizontal drain details; surcharge details; large unsuitable foundation excavation and backfill areas; and soil stabilization details. Most projects will not require grading sections.

400.06(10) Alignment Plan or Alignment/Right of Way Plan

See Contract Plan [Examples 4-19 and 4-20](#).

The alignment and right of way (R/W) information will appear on the same series of plan sheets for most projects.

To reduce the number of plans sheets, include Alignment/Right of Way Plans only when they are necessary for contractors to perform their work.

If R/W information is not required (such as for a paving project), the alignment information could be shown on another plan series, such as the Site Preparation Plan series or the Paving Plan series, as long as the additional information does not cause overcrowding of the plan sheet.

Site preparation information may appear with the Alignment Plans, but only if there is minimal existing topography and minimal site preparation work to be shown. If there is considerable topography or a great deal of site preparation work to be shown, the information is to be placed on a separate plan series.

Note: If Roadway Profile sheets are included in the project, make sure the station limits on each Profile Plan sheet match exactly the station limits of each Alignment Plan sheet. The alignment and profile may be shown on the same plan sheet if together they don't cause overcrowding. For general information on Roadway Profile sheets, see Section 400.06(12).

400.06(10)(a) Alignment/Right of Way Plan Series

The following information will normally appear on the Alignment/Right of Way Plan series:

1. Construction centerlines for all roadways being constructed or modified.
2. All stationing, bearings, and curve data associated with each construction centerline. For new construction, ramp stationing will always run in the same direction as the main line stationing.
3. Right of way centerline—not required if there is no need to show R/W. (see discussion below).
4. Right of way lines. All WSDOT R/W Boundary Lines (proposed and existing), without exception, will always be solid lines on the Contract Plans. Proposed R/W lines are thicker than existing R/W lines.

5. Ties of all right of way breaks to either the right of way or construction centerlines—show both station and offset distance to the precision of the R/W plans.
6. Construction permits with private citizens, and all easements, identified by type and use.
7. Ties of all construction permits and all easements to either the right of way or construction centerline—show both station and offset distance.
8. Township and Range Lines that exist on the area of the plan sheet. Township and Range Lines that cross centerline need the crossing point station, along with appropriate descriptive information (such as bearing and distance to found corners).
9. Limited access hachures when appropriate. Hachures need to be drawn to the correct stationing, but the stationing of the ends or breaks in limited access does not have to be identified on the construction plans.
10. Found Section Corners and monuments, with station and offset ties to construction centerline.
11. Station and offset ties to railroads and railroad rights of way that intersect the project or are affected by the project. Also, title the name of the railroad.
12. Corporate limits and county lines with station identification where they cross the construction centerline.
13. Names of rivers, streams, bays, and inlets, their direction of flow and meander lines, and the ordinary high tide or high-water lines of navigable waterways and any required environmental information for right of way plans. See [400.06\(19\)](#) for additional requirements.
14. On all projects that include grading, show the Fill and Cut slope catch lines. (“F” for fill slope catch lines and “C” for cut slope catch points. It may be desirable to show slope catch lines on the Drainage Plan; however, if this is done, the right of way line must also be shown on the Drainage Plan.
15. The outline of sand drainage blankets, unsuitable foundation excavation, and toxic waste excavation areas.
16. Show all found property corners along WSDOT R/W lines with a note stating, “Per RCW 58.09.130, any monument or corner disturbed by the Contractor’s operation shall be replaced at no cost to the Contracting Agency.”
17. Primary Control Point – Primary control points are displayed in their coordinate location and labeled with the designation ID only. The primary control point table and basis of bearing content will be on the first sheet or the first sheet that can accommodate both without obscuring pertinent sheet information (see [Example 4-20](#)).
18. Show all wells (including decommissioned wells) on the alignment plans. Include the unique well identification tag and the well location in assigned project coordinates. See Section [700.01\(8\)\(a\)](#) Decommissioning of Wells.
19. Add boring locations (symbol).

400.06(10)(b) Right of Way Centerline

When the right of way centerline is coincidental with the construction centerline, provide an equation at the Begin Project and End Project to show the relationship between the official right of way stationing and the construction centerline stationing. Provide an equation showing the relationship between the construction centerline and the right of way centerline at the location of Right of Way Plan equations. All right of way offsets and associated stationing will then be referenced to the construction centerline.

When the right of way centerline is **not** coincidental with the construction centerline, the same procedure described in the previous paragraph may be used. Show the offset distance between the right of way and construction centerlines at the Begin Project and End Project. In addition to the equations at the Begin Project and End Project, show equations at all points where the right of way and construction centerlines cross and at the location of Right of Way Plan equations.

400.06(10)(c) Right of Way Stationing/Alignment

The official Right of Way Plans may be included in the Contract Plans under the following circumstances:

- The official right of way stationing runs the opposite direction of the construction stationing.
- The right of way alignment is substantially different than the construction alignment and is not easily tied. For example, the right of way alignment has numerous curves that do not exist in the construction centerline and the right of way would have to be described using metes and bounds as opposed to offsets from the construction centerline.

In either of the two circumstances above, contact the HQ Right of Way Plans Section and request that it prepare the existing Right of Way Plans to be included in the Contract Plans. Provide the HQ Right of Way Plans Section with the equation relating the Begin Project and End Project construction centerline to the existing R/W stationing. If this option is used, the HQ Right of Way Plans Section needs to be notified early in the design process so that the work can be added to its schedule, to ensure the plans can be prepared within the PS&E schedule.

400.06(10)(d) Roadway Alignment/Right of Way Plan

Township and Range information does not have to be shown on the Alignment Plans unless one or both of the following cases occurs:

- The Township or Range Lines cross the centerline, in which case show the line with the station of the centerline intersection identified.
- Right of way boundary lines are shown WITH dimensions from the roadway alignment.

Section Lines only have to be shown on the Alignment Plans if the Section Corners are found, requiring that the ties to centerline be shown.

Show the following information for all horizontal alignments:

1. Line identification, using alpha designation and stationing (M 5+50).

2. Station ticks shown on the top side of the alignment line—top as related to the direction of the stationing.
3. Tangent bearings.
4. Point of intersection (PI), point of curvature (P.C.), point of tangency (P.T.), point on tangent (POT), point on curve (POC), point of compound curve (PCC), point of reverse curve (PRC) and point on semi tangent (POST) for all horizontal alignments where applicable.
5. Angle points (A.P.) in horizontal alignments.
6. Curve data box showing:
 - Station of the point of intersection (P.I.) of bearings for each curve.
 - P.I. Northing and Easting coordinates
 - Delta for each curve: deflection angle between intersecting bearings.
 - Radius of each curve.
 - Tangent length for each: distance from P.C. and P.T. to the P.I.
 - Length of curve for each curve: distance from P.C. to P.T. along the horizontal curve.
 - Full super rate for each horizontal curve.

400.06(10)(e) Construction Stationing

Show construction stationing increasing from the beginning of the project to the end, from south to north on odd-numbered highways, and from west to east on even-numbered highways.

All ramp stationing for new construction is to increase in the same direction as the main line stationing.

Ramp stationing should begin at station 10+00 to avoid negative stationing due to alignment changes.

Show offset equations as follows:

- The secondary line (ramp, crossroad, or right of way centerline) designation and station is listed first.
- The main line (construction centerline) designation and station, perpendicular distance, and left or right is listed next. The direction (left or right) is referenced from main line looking ahead on stations.

400.06(10)(f) Linear Equations

Linear equations should not be an issue if construction stationing is established for the project instead of using right of way stationing. If linear equations are present, make sure that they are gap equations and not overlap equations. Overlap equations cause confusion because of the duplication of stationing caused by the overlap. To convert an overlap equation to a gap equation, a 1 can be added in front of the Ahead station (5+00 would become 15+00), or the first digit of the Ahead station can be increased by 1 (110+00 would become 210+00).

Examples:

1. Overlap equation 10+00 BK =
5+00 AHD
adding 1 in front of the Ahead station would become
Gap equation 10+00 BK =
15+00 AHD
2. Overlap equation 150+00 BK =
110+00 AHD
add 1 to the first digit of the Ahead station would become
Gap equation 150+00 BK =
210+00 AHD

When showing the equation in the plans, the BACK station goes on the backside of the equation line and the AHEAD station goes on the ahead-side of the equation line.

400.06(11) Quantity Tabulation Plan Sheets

See Contract Plan [Examples 4-21, 4-48 and 4-53](#).

Quantity Tabulation Plan sheets are used to tabulate the locations, quantities, and notes pertaining to specific bid items. Quantity Tabulation Plan sheets may not be required on projects where the information is shown elsewhere in the contract.

400.06(11)(a) Quantity Tabulation Plan Sheet Items

The following types of items will normally appear on Quantity Tabulation sheets:

1. Removal items—except items paid by lump sum.
2. Asphalt concrete curb and asphalt concrete gutter.
3. Timber and lumber—except bridge items.
4. Cement concrete approach.
5. Cement concrete curbs, and curb and gutter.
6. Guardrail items, including anchors, terminals, and transition items.
7. Concrete barrier items.
8. Impact attenuators.
9. Guideposts.
10. Raised pavement markers, paint lines, and pavement marking items.
11. Conduit pipe—except bridge, illumination, and traffic signal system items.
12. Wildlife reflectors.
13. Steel reinforcing bars and wire mesh—except bridge structural retaining walls and drainage items.
14. Monument cases and covers.
15. Cement concrete sidewalk.
16. Asphalt concrete sidewalk.

17. Concrete slope protection.
18. Fencing items, including gates and end, corner, and pull posts.
19. Adjustment items.
20. Delineation lights.
21. Temporary Erosion and Sediment Control Devices.

400.06(11)(b) Quantity Tabulation Plan Sheet Preparation

Prepare Quantity Tabulation Plans on 11-inch by 17-inch sheets. The Quantity Tabulation spreadsheet program is available through the Region Plans Offices or the HQ Project Development Unit. For additional information and instructions for the Quantity Tabulation spreadsheet, see the Appendices.

Standard sheets have been prepared with the heading "Quantity Tabulation." A descriptive addition (see types of items above) may be added after the plan sheet heading "QUANTITY TABULATION – XXXXXXXX XXXXXX" to indicate what type of work is included on this plan sheet.

Place Quantity Tabulation Plan sheets immediately preceding the plan sheets that contain the tabulated items. This will intersperse them throughout the plans.

For projects involving only a few items, the quantities may be placed in data boxes on appropriate plan sheets or on Profile sheets, eliminating the need for Quantity Tabulation Plan sheets. Data boxes should be laid out in the same manner as the Quantity Tabulation sheets.

Provide blank columns between listed bid items, and blank rows in station listing (about every fifth entry and a space or two between each reference sheet listed). This procedure allows for the addition of bid items and stationing with ease, even during the addendum phase.

400.06(11)(c) Bid Items

Place Bid items from left to right in the same order in which they appear in the Summary of Quantities Estimate.

Identify bid items on the Quantity Tabulation Plan sheets exactly as they appear in the [Standard Specifications](#) (spelling, punctuation, spacing, and so on) and in the same order as they appear on the Summary of Quantities.

If there are more bid items to be tabulated than will fit across the top of the sheet, with the appropriate blank spaces, additional Quantity Tabulation Plan sheets will be required. The station listing will be identical for the continued sheets. Likewise, if there are more station listings than will fit on a single sheet, with the required blank spaces, additional Quantity Tabulation Plan sheets will be required. The bid items across the top will be identical for the continued sheets.

Each time an item is used in a different location provide a separate quantity entry. Related items, however, may be included in a single entry if the station limits are the same. For example, a single entry could include the type of guardrail, required anchors, and transition types.

Round each quantity entered on the Quantity Tabulation Plan sheet appropriately at the time of entry. Do not add up the unrounded quantities and round the total to carry forward to the Estimate/Summary of Quantities. (See the information on rounding in [400.06\(5\)](#), Summary of Quantities.)

The bid item totals on the Quantity Tabulation sheets must be consistent with the bid item totals entered in the Summary of Quantities Estimate.

400.06(11)(e) Plan Reference No.

The **Code** column contains the Quantity Tabulation code number, which is made up of the Plan Reference No. and the number identifying the individual construction feature on the sheet (for example, P1-1, P1-2, ... P1-6, P2-1, P2-2, ... P2-26). List the numbers in ascending order of plan sheets.

Bid items, identified by station(s) and quantity or quantities, on individual Quantity Tabulation Plan sheets are tied directly to the plan sheet series they are related to by the number immediately following the Plan Reference No. mentioned above. The related series sheet is to have its own consecutive series of numbers identifying construction features (octagonal enclosed numbers beginning with number 1) in the top left corner of the sheet and progressing across and down the sheet. Draw a light, arrowless line from the octagon to the construction feature. When a construction feature is continued on more than one sheet, divide the octagon on the continued sheet with a horizontal line. Insert the Plan Reference No. on which the construction feature first appears in the upper half and show the first sheet individual identifying number in the lower half. If this is done, a larger-scale octagon may be used. The octagonal symbol is not used for any other purposes.

For items such as pavement markings that are continuous for the entire project, list the station limits and leave the code column blank.

400.06(11)(f) General Notes

The General Notes will include information required to complete the data for a particular construction feature, such as:

- Guidepost type and color.
- Guardrail placement case, terminal connection, alternate anchor type, and connection type when connecting transition to stiffer barrier like bridge rail.
- Acceptable impact attenuators for each location.
- References to applicable Special Provisions identify the Special Provision by the exact name.
- References to applicable details in the Contract Plans. Identify the exact plan sheet (using the Plan Reference No.) where the detail is located.
- Reference to applicable [Standard Plan\(s\)](#). Provide the Standard Plan number, which is located in the bottom right corner of the page.
- Type of curbing to be used.

If the quantities for an item appear on other plan sheets in addition to the Quantity Tabulation Plan sheets, provide cross-references to the sheets where the additional quantities can be found.

400.06(12) Site Preparation

See Contract Plan [Example 4-22](#).

The Site Preparation Plan series is where all existing topography within your project limits is to be shown, as well as all the project removal and demolition work.

If there is very little topography to be shown and very little removal and demolition work to be performed, this information can be shown on the Alignment/Right of Way Plan series as long as it does not compromise the information required on the Alignment/Right of Way Plans.

Show construction centerlines on the Site Preparation Plans; however, lanes, shoulders, and other features being constructed are not to be shown.

Identify removal and demolition of existing features, paid as separate items, using the General Notes in the Quantity Tabulation sheets.

Identify items included in the lump sum price for "Removal of Structures and Obstructions," with notes located directly on the appropriate plan sheet. For example, removal of wire fence should be identified with a note such as "wire fence to be removed." Items of work (such as removal of guideposts) included in the lump sum price for "Removal of Structures and Obstructions" that cover the entire project do not have to be identified on the plan. Items of work being paid as "Removal of Structures and Obstructions" will not appear on Quantity Tabulation sheets.

If large, complete areas of pavement, sidewalk, or curbs and gutters are being removed, it is best not to use cross-hachuring to identify these areas. Large areas of cross-hachuring detract from the plans and often hide important information. It will suffice to show the limits of the removal and identify the area with a General Note on the Quantity Tabulation sheet, or note on the plan sheet "begin pavement removal/end pavement removal." If there are a number of small, isolated areas of pavement removal, cross-hachuring may be used to identify these areas.

400.06(13) Roadway Profiles

See Contract Plan [Example 4-23](#).

Roadway profiles are required only when there is a change in the vertical alignment of the roadway under construction. If only a section of the vertical alignment is changed, a profile is required only for that section.

The horizontal scale of the roadway profile is typically 1"=100' whenever practical, labeled at even stations. Other horizontal scales may be used in order to clearly show profile elements.

Roadway Profile vertical exaggeration is typically 10:1 (H:V) labeled at even 10' increments with 1"=100' horizontal scale.

400.06(13)(a) Profile Sheets

Show the following required information on Profile sheets:

1. Roadway section limits with arrows. These are always to be the topmost entry on the Profile sheets.
2. Superelevation diagrams. These are usually included on the profile sheet shown above the profile. However, superelevation diagrams can be shown on a separate sheet if they cause crowding of other required information. See below this list for more details about superelevation diagrams.
3. The finished profile grade line as specified in the [EEDS Manual](#).
4. The datum symbol and information on all sheets. North American Vertical Datum (NAVD) 88 is the desirable vertical datum. However, National Geodetic Vertical Datum (NGVD) 29 is acceptable in certain situations. If there is a need to use NGVD 29 datum on a project, contact the HQ Right of Way Plans Section, Land Survey Support, for concurrence for use.
5. All vertical control, including benchmarks that exist in the area of the alignment profiled on the sheet—both temporary and permanent. Include all pertinent information associated with vertical control points such as location, offset, stationing, elevation, and so on.
6. Gradients between vertical curves—shown as a percentage, carried out to a sufficient number of places (generally three) so that the calculation of the elevation at one VPI on the given gradient will give the elevation at the next VPI.
7. Station and elevation of the Vertical Point of Intersection (V.P.I.) of the gradients.
8. Beginning point of the Vertical Curve (B.V.C.) station and elevation and the Ending point of the Vertical Curve (E.V.C.) station and elevation of each vertical curve.
9. Elevations and stations through each vertical curve on even stations, or if every station adds too much clutter add the elevations to just the even station intervals not greater than 200 feet.
10. Length of each vertical curve.
11. Elevation and station at each Vertical Angle Point (V.A.P.). A V.A.P. is a gradient break without a vertical curve. The elevation is shown to 0.01 foot.
12. Existing ground shown as a dashed line.
13. Areas of work or quantities, with arrows, between the station-to-station limits of the work, or at 10 station (1,000') totals if the work extends beyond 10 station totals, or at other logical breaks such as bridges or group breaks. If these logical breaks are slightly more or less than 1,000 feet apart, it would be appropriate to have a 1,300-foot total or a 700-foot total.
14. Quantities, including but not limited to roadway excavation; controlled blasting; vertical sand drains; unsuitable foundation excavation; toxic waste excavation; embankment compaction; special backfill; clearing and grubbing; seeding; compost; topsoil; and fertilizing and mulching.

15. The use of the term “embankment” by itself is permitted only when Method A compaction is specified. In this instance, it must be noted that embankment quantities are shown for informational purposes only.
16. Details showing sideslopes for unsuitable foundation excavation and toxic waste excavation (or detailed on separate sheets.) The bottom of unsuitable foundation excavation and toxic waste excavation should be shown as a squiggly line to indicate that the actual bottom elevation of the excavation is unknown.

Give some thought to the layout of the Profile sheets prior to placing information, because the layout is to be the same on each Profile sheet in the series. Place all quantity arrows in the same position on each sheet to allow quantities to be located easily.

If there is only minor grading on the project, and Profile sheets are not used, show 10 station totals, or similar quantity breakdowns, on a Quantity Tabulation sheet.

Superelevation Diagrams

The Superelevation diagram is typically shown on the profile sheets below the roadway sections and above the profile. If the sheet becomes too crowded, the superelevation diagram may be placed on its own sheet. The superelevation diagram not only shows the full super but also the superelevation transitions. Label the station of each point of the superelevation transition to the 100th of a foot. The superelevation diagram shows the cross slope of both sides of the roadway on either side of the pivot point.

The typical transition points are:

- End/Begin Normal Crown – Where the tangent normal crown cross slope ends, and the super transition begins.
- Level Crown – Where one side has rotated up to a 0% cross slope to the pivot point.
- Crown Slope - Where the rotating side has rotated up to match the other side’s cross slope. After this point both sides rotate around the pivot point.
- Begin/End Full Super – Where both sides have rotated around the pivot point to achieve full super.

Superelevation Diagram scales:

- Horizontal: Equal to horizontal profile scale
- Vertical (Super transition points): 1/10 of horizontal scale

400.06(14) Structure Notes

See Contract Plan [Examples 4-24 and 4-29](#).

All of the information shown on the Structure Note sheet and the Drainage Plans and Profiles will meet the requirements contained in the [Hydraulics Manual](#) and the [Standard Plans for Road, Bridge, and Municipal Construction \(Standard Plans\)](#).

- (a) Structure Note sheets are used to tabulate locations, bid items, quantities, and notes pertaining to drainage items, utilities, water lines, and so on.
- (b) Prepare Structure Notes as 11-inch by 17-inch sheets. The Structure Note spreadsheet is available through Region Plans Offices or the HQ Project Development Unit. For additional information and instructions for this microcomputer spreadsheet, see the Appendices.
- (c) Standard sheets have been prepared with the heading “Structure Notes.” Insert a descriptive addition such as “Utilities” or “Irrigation” after the heading “STRUCTURE NOTES – XXXXXXX XXXXXX” to indicate what type of work is included on the plan sheet. Place Structure Note sheets immediately preceding the plan sheets that contain the features being tabulated.
- (d) For those projects involving only a few drainage bid items at a few locations, the information normally provided on Structure Note sheets may be provided on the appropriate plan sheets, in either a tabular form in data boxes, or placed in a convenient location on the sheet, with a leader line used to connect the information with the corresponding drainage feature.
- (e) Provide blank columns between listed bid items, and blank rows in station listing—about every fifth entry and a space or two between each reference sheet listed. This allows for the addition of bid items and stationing with ease, even during the addendum phase.
- (f) Place bid items from left to right in the same order in which they appear in the Summary of Quantities Estimate.

Identify bid items on the Structure Note Plan sheets exactly (spelling, punctuation, and spacing) as they appear in the WSDOT Standard Item Table.

- (g) If there are more bid items to be tabulated than will fit across the top of the sheet, with the appropriate blank spaces, additional tabulation sheets will be required. The station listing will be identical for the continued sheets. Likewise, if there are more station listings than will fit on a single sheet, with the required blank spaces, additional tabulation sheets will be required. The bid items across the top will be identical for the continued sheets.
- (h) Each time an item is used in a different location, provide a separate quantity entry. Related items, however, may be included in a single entry if the station limits are the same. For example, a single entry could include a catch basin, pipe, structure excavation, and riprap.
- (i) Round each quantity entered on the Structure Note Plan sheet at the first point of entry. Do not add up the unrounded quantities and then round the total to carry forward to the Summary of Quantities Estimate. (See appropriate rounding information in [400.06\(5\)](#).)
- (j) The Code column is to contain the structure code number, which is made up of the Plan Reference No. and the number identifying the drainage features on the sheet (for example, D1-1, D1-2, ... D1-6, D2-1, D2-2, ... D2-26). List the numbers in ascending order of plan sheets.
- (k) Indicate the construction centerline stationing on the Structure Note sheet for cross culverts, and indicate station and offset for each end of longitudinal pipe installations. If a

- sanitary or storm sewer line stationing is used, use its stationing on the Structure Note sheet, and the plan sheets will indicate the appropriate ties to the construction centerline.
- (l) The bid item for storm sewer pipe will be “Schedule ___ Storm Sewer Pipe ___ In. Diam.” A table indicating the acceptable pipe alternates is included in Section 7-04 of the *Standard Specifications*. There will be times when not all of the pipes shown as acceptable alternates in the table will be acceptable because of conditions on a specific project. When there are pipes not acceptable for a specific project, include a General Note on the Structure Note sheet identifying the unacceptable pipe type. The *Hydraulics Manual* contains a complete discussion on storm sewer pipes and is to be used for guidance.
- (m) When WSDOT does sanitary sewer pipe work, it is usually to extend or replace a system affected by the highway work. The utility or local agency will normally specify the type of pipe, or specify that the pipe extension or replacement be in kind. The system owner’s request for pipe type is to be placed in the P&SE portion of the Project File to serve as backup justification. The bid item will be the pipe type requested by the owner, and the General Note on the Structure Note Plan sheet will read either “no acceptable alternates” or “replace in kind,” whichever is appropriate.
- (n) The General Notes will include information required to complete the data for a particular drainage feature, such as:
- Acceptable or unacceptable pipe alternates for drain, underdrain, and culvert pipes.
 - Unacceptable alternates for culvert and storm sewer pipes bid on a schedule basis.
 - The appropriate treatment for pipes, except when the treatment is described by the bid item name.
 - The corrugation dimension for corrugated steel pipe when a size other than the standard size corrugation is required.
 - Specific vertical elongation where elliptical-shaped steel or aluminum pipes are required, whether the elliptical pipe is specified in the bid item or as an alternate.
 - Procedures or instructions necessary to complete construction of the drainage feature.
 - Required features, such as beveled end sections, safety bars, and other improvements.
 - References to applicable details in the Contract Plans. Identify the exact plan sheet using the Plan Reference No. where the detail is located.
 - References to applicable *Standard Plans*, with the full Standard Plan number.
 - References to applicable Special Provisions. Identify the Special Provision by the exact name.

The bid item totals on the Structure Note sheets must be consistent with the bid item totals entered in the Summary of Quantities Estimate.

- (o) If the quantities for an item appear on other plan sheets in addition to the Structure Note sheets, provide cross-references to the sheets where the additional quantities can be found.

400.06(15) Drainage Plan

See Contract Plan [Examples 4-25 and 4-28](#).

Each plan sheet will have its own consecutive series of numbers identifying drainage features. The numbers (beginning with number 1 enclosed in circles) will begin in the top left corner of the sheet and progress across and down the sheet. Draw a light, arrowless line from the circle to the drainage feature or features. These numbers relate directly back to the Structure Note plan sheets.

When a drainage feature is continued on more than one sheet, divide the circle with a horizontal line. The plan sheet reference number on which the drainage feature first appears will be inserted in the upper half and the individual identifying number will be inserted in the lower half. A larger-scale circle may be used if this is done. The circle symbol is reserved for the purpose of identifying drainage features and is not to be used for any other purpose.

If a sanitary or storm sewer line stationing is used, indicate the appropriate ties to the construction centerline.

Each cross pipe will have a separate code number, which will include any attached drainage structure and any riprap, quarry spalls, or other end treatment being constructed in conjunction with the pipe.

Each run of pipe in a closed sewer system will have a separate code number, which will include the pipe and the drainage structure on the inlet end of the run of pipe.

If multiple pipes are to be placed in the same trench, they may be combined under a single structure code.

Indicate the skew angle for all skewed cross pipes, unless both ends are controlled by station and offset and the stations and offsets appear on the Structure Note sheet.

A roadway ditch that is shown as part of a roadway section does not need to be shown on the Drainage Plans. This roadway ditch is included in the earthwork for Roadway Excavation Incl. Haul; do not assign a Structure Note number.

When a ditch is constructed based on a drainage profile in the Drainage Plans, then this ditch needs an assigned Structure Note number and the excavation is included in the bid item Ditch Excavation. This excludes ditches that are part of the roadway.

400.06(16) Drainage Profiles

See Contract Plan [Examples 4-26 and 4-27](#).

The established scale controls the drainage profiles vertically. There is usually no horizontal scale for the drainage profiles, but it is recommended that distances represented be drawn proportionately. Draw each profile in proportion horizontally for the length of the profile (the space representing 10 feet will appear the same for the length of the profile, and it will appear to be approximately two times a space, representing 5 feet).

The profiles can be made visually easier to follow by using an elongated triangle to represent manholes and an elongated rectangle to represent other drainage structures (such as catch basins or inlets). The distance shown between drainage structures is not the length of pipe but the horizontal distance from center of structure to center of structure. If it happens to appear to be the same as the length of pipe shown in the Structure Note Plan sheet, it is merely coincidental.

Draw pipe diameters with proportionate scale, so a 12-inch-diameter pipe will be drawn half the size of a 24-inch-diameter pipe.

Draw drainage profiles as a straight-line representation of the path the water will take as it flows through the system, without regard for the actual plan view direction the pipes are running. You do not have to break the profile because a system that had been running parallel to the centerline has turned ninety degrees at a catch basin and crossed the roadway.

At locations where two or more pipes bring water to a drainage structure and one pipe carries the water away, there will have to be breaks in the profiles. One profile will continue through the common drainage structure and show the water leaving the structure, while the other profiles will stop or start at the common structure. Draw a leader line between the representations of the common drainage structure with the note "same catch basin," which is the tie between the profiles and completes each without having to draw the exit pipe a number of times. The information for the common structure will only be shown on one profile, usually the one that shows the outlet pipe.

400.06(16)(a) Drainage Profile Information

Provide the following information on the drainage profiles:

1. Inlet and outlet flow line elevations of pipes—shown below the pipe profile. Inlet and Outlet flow line elevations are those elevations derived from pipe slopes carried to the center of drainage structure.
2. Outflow treatments such as riprap, quarry spalls, and, if the ditch is other than a roadway or median ditch, ditch profiles.
3. Debris deflectors, standpipes, and headwalls.
4. The type of drainage structure and station and offset location of the structure—shown above the structure.
5. The rim elevation of manholes, catch basins, inlets, or other drainage structures—shown above the structure.
6. The horizontal distance between adjacent drainage structures from center of structure to center of structure.
7. The size of pipe in each run—you do not have to include the type of pipe.
8. The pipe slope—carried out to sufficient decimal places (generally three) so that when the calculation is made from the indicated inlet flow line, on the given grade, for the given distance, the result will be the outlet flow line indicated to 0.01 foot.
9. Finished ground line above the pipe.

10. Original ground line if pipes will be placed prior to embankment construction or if original ground differs from the finished ground line.

400.06(17) Utility Plan

See Contract Plan [Example 4-30](#).

When the contractor is to work on the existing utilities as part of the contract, plan sheets for utility structure notes, plans, and details will be required. These follow the same general guidelines as specified for Drainage Structure Notes/Plans/Details.

To locate utilities in areas where only a few utilities exist, consider using tables with stations and offsets in lieu of creating additional plan sheets.

[RCW 19.122.040](#) requires WSDOT to identify and locate known underground utilities in our contracts. Make every effort to also identify and locate aboveground utilities.

RCW 19.122.040 “Underground facilities identified in bid or contract – Excavator's duty of reasonable care – Liability for damages – Attorneys' fees,” reads as follows:

- (1) Project owners shall indicate in bid or contract documents the existence of underground facilities known by the project owner to be located within the proposed area of excavation. The following shall be deemed changed or differing site conditions:
 - (a) An underground facility not identified as required by this chapter or other provision of law; and
 - (b) An underground facility not located, as required by this chapter or other provision of law, by the project owner, facility operator, or excavator if the project owner or excavator is also a facility operator.
- (2) An excavator shall use reasonable care to avoid damaging underground facilities. An excavator shall:
 - (a) Determine the precise location of underground facilities which have been marked;
 - (b) Plan the excavation to avoid damage to or minimize interference with underground facilities in and near the excavation area; and
 - (c) Provide such support for underground facilities in and near the construction area, including during backfill operations, as may be reasonably necessary for the protection of such facilities.
- (3) If an underground facility is damaged and such damage is the consequence of the failure to fulfill an obligation under this chapter, the party failing to perform that obligation is liable for any damages. Any clause in an excavation contract which attempts to allocate liability, or requires indemnification to shift the economic consequences of liability, that differs from the provisions of this chapter is against public policy and unenforceable. Nothing in this chapter prevents the parties to an excavation contract from contracting with respect to the allocation of risk for changed or differing site conditions.
- (4) In any action brought under this section, the prevailing party is entitled to reasonable attorneys' fees.

[2011 c 263 § 8; 1984 c 144 § 4.]

Identified utilities are to be shown in the bid or contract documents as stated in the RCW. The Site Preparation Plan series is where they would normally be shown (see [400.06\(12\)](#), Site Preparation). If the project is in an area with many utilities, as well as many other topographical features, it may be necessary to separate the utilities on a separate series of plans following the Site Preparation Plan series. The best available information as to the location of underground and overhead utilities is to be used. Contract Plan [Example 4-30](#) depicts how utilities are typically shown on a plan sheet.

Do not forget to include WSDOT utilities, such as traffic signal, illumination, and ITS conduits and fixtures.

The required amount of detail related to utility location is directly proportional to the amount of underground work involved in the contract and the proximity to the utility. A simple paver should require less utility detail than a project with excavation at or near a 24-inch natural gas line or a 96-inch sewer line.

400.06(18) Contour Grading Plan

See Contract Plan [Example 4-18](#).

Contour Grading Plans provide finished ground contours. These plans require the Region Landscape Architect's stamp (or the HQ Landscape Architect's stamp for regions without a Landscape Architect), regardless of whether they are prepared by the design team or the landscape section. (See the [Design Manual](#) for more information.)

400.06(19) Wetlands, Mitigation Sites, Detention/Retention Site Plans and Stream Plans

400.06(19)(a) Wetlands

Show all wetlands on the construction plans, whether inside the right of way or not, that could be impacted by the construction work. Use standard symbols found in the [Electronic Engineering Data Standards Manual](#).

Wetlands within the right of way must be delineated in the field by a qualified wetland biologist and survey data collected. Delineated wetlands will, in most cases, have buffer zones associated with them. Construction contract plans must accurately show the location of wetlands and their buffers based on the survey data collected. Wetlands that are outside the right of way may have buffers that extend into the work areas shown on the construction contract plans. Impacts to buffers of off-site wetlands may result in indirect impacts to the wetland that reduces its functional value.

The buffer zone is established by the local jurisdiction and may not always be identified on the permit. For each wetland identified within a project area, check with the Region Environmental Office to get the buffer zone information. The buffer zone is developed by adding the required buffer width to the surveyed wetland boundary.

If a contractor is allowed to work within an existing wetland or wetland buffer zone, delineate the allowable work area by the cut and fill line. The contractor shall possess a permit identifying each wetland in which work is allowed.

Show wetlands and their buffers on the Vicinity Map and all other construction contract plan sheets, such as those showing cut/fill lines, staging and stockpile locations, drainage, TESC, or other features that could impact them.

For further information, see the [Roadside Policy Manual](#) and the [Environmental Manual Chapter 431 Wetlands](#).

400.06(19)(b) Wetland Mitigation Sites

A wetland mitigation site is a wetland area that has been or is being established (created), restored, enhanced, or preserved to compensate for wetlands impacted by construction.

Show all wetland mitigation sites on the construction contract plans and identified as either “existing” or “to be constructed.” A mitigation site, whether existing or to be constructed, is always identified as a mitigation site on construction contract plan sheets. Wetlands in mitigation sites become subject to regulatory jurisdiction as soon as they are constructed.

If a contractor is allowed to work within an existing wetland mitigation site, delineate the allowable work area by the cut and fill line. The contractor shall possess a permit identifying each wetland in which work is allowed.

Contact RWPlans@wsdot.wa.gov with Township, Range, Section, State Route (SR), and Mileposts (MP) of the project, to obtain copies of the Sundry Site Plans that show existing mitigation sites on record.

400.06(19)(c) Detention/Retention Sites

Show all facilities related to the detention, retention, and treatment, filtration, or drainage of stormwater or surface water, whether existing or to be constructed, on the construction contract plans and labeled as Stormwater Treatment Areas. It is important to identify stormwater treatment areas so they will not be misconstrued to be wetlands or mitigation areas in the future.

400.06(19)(d) Stream Plans

See Contract Plan [Examples 4-31 through 4-47](#).

When realigning or regrading a stream or river as part of the contract, a Stream Plan, Stream Profile, and Stream Details are required. If large woody material or scour protection are included in the design, plan and details sheets for the scour protection feature are also required. Stream designs may include complex design components. The use of photographs, color line work, 3D renderings, or isometric views are encouraged to be used in the Stream Plan set to convey design information. The Stream Plan set requires the stamp from the Hydraulic Engineer of Record, which is typically from the HQ Hydraulics Office or an engineer approved by the HQ Hydraulics Office that has passed the most current WSDOT Fish Passage Certification Training.

Example Plans [4-31](#), [4-40](#) and [4-45](#) provide examples of Stream Plan Sheets. Show the following information on the Stream Plan set:

- Stream grading slope break lines, the limits of fill and or excavation, begin and end of channel grading, and the centerline of the new stream alignment, with stationing increasing from downstream to upstream. The new stream alignment will be labeled and also include an arrow showing flow direction.
- Existing contours and existing features shown outside of the perimeter of the new stream. If major roadway changes are proposed, new contours and features may be appropriate in lieu of the existing contours in the vicinity of the roadway. Existing contours and features within stream grading limits should be masked out for clarity of stream grading.
- Large Woody Material (LWM), boulders, meander bars, and other habitat complexity features. The following note must be added to the Stream Plan if LWM is included: “LOCATIONS AND ORIENTATION OF LARGE WOODY MATERIAL (LWM) STRUCTURES AS SHOWN ON THIS SHEET ARE APPROXIMATE, THEY SHALL BE STAKED PER PLAN AND FINAL LOCATIONS AND ORIENTATIONS APPROVED BY THE ENGINEER.” For projects with more complex habitat features a separate plan sheet may be required. See Example Plan Sheets [4-31](#) and [4-32](#) for an example of when it might be appropriate to separate stream grading from habitat complexity features in plan view. See [Example Plan 4-40](#) for an example of LWM incorporated into the Stream Plan Sheet. LWM features and habitat complexity features will be called out. LWM features that are buried or partially buried will be illustrated by hachures or dashed outlines.
- If a new crossing structure is included in the design, show the location and inside width of the structure, wing walls, retaining walls, abutments, and any other structural items. Structure details may be incorporated into the Stream Plan, Profile and Details series; however, this may require a dual stamped set of plan sheets as this work is not done by the hydraulics engineer of record.

Example [Plan Sheet 4-33](#) provides an example of a Stream Profile sheet. Show the following information on the Stream Profile set:

- The stream profile sheets will show the proposed grade or grades relative to the existing grade. The depth of the streambed material will be depicted, also the beginning and ending of walls, culverts, and grading. Finished grade elevations will be called out at beginning and end of stream grading and structures and at any grade breaks in the vertical profile. If meander bars cross the stream centerline, then they should be displayed in the profile as well.
- Informational quantities for channel excavation, streambed sediment, streambed cobbles, Streambed boulders, and LWM structures, as well as structure excavation, and shoring, when appropriate.

- Typical sections will be displayed at the top of profile to convey station range, including transitional grading.

Example Stream Detail sheets are provided in [Example Plans 4-34 through 4-39, 4-41 and 4-42, 4-46 and 4-47](#). For the purpose of this manual, Section Details include the typical stream grading sections both within and outside of new structures, as well as details for LWM, meander bars and other habitat complexity features. Show the following information on the Stream Detail set:

- Stream Details will require stream sections drawn facing upstream (looking upstation along the stream alignment) and show the grading design for the stream. Provide slope and width of streambed slope breaks as well as station range. Typical stream grading sections will show the streambed material lifts.
- Stream Details will require streambed material placement sequence of work detail (see [Example Plan 4-42](#)). Spacing and thickness of sand lifts may vary across projects.
- Provide an appropriate note for streambed material referencing the Special Provisions, for example: “SEE SPECIAL PROVISION ‘WATER CROSSINGS’ FOR STREAMBED MATERIAL, MEANDER BAR MATERIAL AND STREAMBED LIFTS FINAL INSTALLATION SHALL PROVIDE A WELL GRADED MIX OF STREAMBED SEDIMENTS AND STREAMBED COBBLES.”
- If the project has LWM, separate sections and anchoring details (see [Example Plan 4-39](#)) are required. If included in the design, show locations of slash and scour holes. The following note must be added to the LWM sections: “LOCATIONS AND ORIENTATION OF LARGE WOODY MATERIAL (LWM) STRUCTURES AS SHOWN ON THIS SHEET ARE APPROXIMATE, THEY SHALL BE STAKED PER PLAN AND FINAL LOCATIONS AND ORIENTATIONS APPROVED BY THE ENGINEER.” Complex, multi-piece LWM structures will require details illustrating construction sequencing (see [Example Plans 4-36 through 4-38](#)). Simpler LWM designs may be conveyed with a typical cross section and control table (see [Example Plan 4-41](#)). Typical LWM sections will clearly label control points both horizontally and vertically and be referenced against the control table. Angles in the section and control table should be avoided when possible as it is easier to establish log orientation and location based off two control points.

When scour countermeasures are part of the design, a Scour Plan and Detail sheet will be included as part of the Stream Plan set. [Example Plans 4-43 and 4-44](#) provide examples.

- Scour Protection Plan will require scour protection extents and identify the rock for erosion and scour protection material class to be installed. A control table will provide station and offset information and elevation. The new stream alignment and structures will be shown as well.
- Scour Protection Detail will require sections drawn facing upstream (looking upstation along the stream alignment) and show the grading design for the scour protection measures. Provide slope and width of streambed slope breaks. Typical stream section will show the scour protection location relative to the new structure

and finished stream. Detail will also show scour protection material thickness and filter material control point location.

- A note will be displayed referring to the appropriate special provision that includes information about the scour protection material.

400.06(20) Paving/Pavement Marking Plan

See Contract Plan [Examples 4-49, 4-50, and 4-54](#).

Paving and pavement marking information will normally be combined on a single series of plans.

If the project requires the paving information to be separate from the pavement marking information, the Paving Plan will show the total roadway and shoulder widths described by the roadway sections, not lane widths. The Pavement Marking Plans will show the lane configuration and widths. The information is not to be repeated on both series of plans.

The Paving/Pavement Marking Plan series may be necessary when the work cannot be shown adequately on the roadway sections. If the roadway sections adequately describe most of the project, only the areas requiring more detailed or specific information need be shown in Paving/Pavement Marking Plans.

Pavement marking criteria is found in the [Design Manual](#) and the pavement marking applications are shown in the [Standard Plans](#). Pavement marking layout information is not required in the plans if the required pavement markings are as shown in the [Standard Plans](#). Pavement marking quantities are to be tabulated on Quantity Tabulation sheets if not accurately shown elsewhere.

When Paving/Pavement Marking Plans are included, they will show all lane and shoulder widths, information on pavement taper lengths and widths, widening for guardrail, and the locations of concrete barrier, guardrail, impact attenuators, and traffic islands. The various areas and types of pavement marking will be identified by General Notes in the Quantity Tabulation sheets; if there is only minor pavement marking, the beginning and ending stations could be shown in the plan for each type in the area.

The only existing information that will appear on the Paving/Pavement Marking Plans will be the existing roadways and approaches beyond the point where the new construction begins or ends to show the tie between the new and existing. The “old” roadway and lane lines through the construction area are not to be shown.

If there is only minor drainage, signing, or illumination work on the project, it can be shown on the Paving/Pavement Marking Plans, provided it does not compromise the clarity of the paving and pavement marking information being shown.

Paving or pavement marking details showing the layout of traffic islands or other features (such as curb ramps) may need to be drawn at a larger scale on separate detail sheets to provide sufficient information or required dimensioning. These details will follow immediately after the Paving/Pavement Marking Plan series.

400.06(21) Plan Detail Sheet

See Contract Plan [Examples 4-50 and 4-51](#).

Provide Plan Details sheets to help ensure the contractor has a clear picture of the work to be performed.

Organize plan details on plan sheets so they are grouped according to plan series. Place the detail sheets as the last set of plans in the plan series. For example, all of the drainage details will be grouped on the appropriate number of sheets and will become the last sheets in the Drainage Plan series—normally following the drainage profiles.

It is important that details be complete, meaningful, and necessary. It is also important that details be drawn at a scale that will clearly show the information when placed on the 11-inch by 17-inch plan sheets.

Plan details are not to be a redrawn Standard Plan. Many times, however, it is necessary to draw details showing a project-specific modification to a Standard Plan. In these instances, sufficient detail is to be provided to indicate the modification, but all of the information on the Standard Plan that is still applicable is not to be redrawn. Instead, a note stating “FOR INFORMATION NOT SHOWN, SEE STANDARD PLAN X-XX” is to be included on the detail.

Details that are not associated with a Standard Plan must be complete, because the contractor is only obligated to provide what is shown on the detail.

The [Electronic Engineering Data Standards Manual](#) contains a number of generic or standard details found in the CAD system. Many of these details can be used as is, or they may be modified to fit requirements for a specific application. Use of these details can save both the designer and the CAD operator considerable time over developing and inputting details from scratch.

400.06(22) Minor Structures

For projects with quantities for minor structures, such as nonstructural retaining walls (see Section 8-24 of the [Standard Specifications](#)) or other like items of work, use one of the following methods to show these quantities in the plans in:

- Show Quantities on Quantity Tabulation sheet(s).
- Show Quantities in tabular form (in data boxes) on the individual plan sheet(s).

400.06(23) Illumination Plan

See Contract Plan [Example 4-55 and 4-56](#).

Illumination systems design criteria is found in the [Design Manual](#).

If the illumination work is minor adjustments to an existing system or the installation of a small system (one or two luminaires) at an intersection, it can often be shown on another series of plans.

400.06(23)(a) Illumination Plan Information

The following information is required for Illumination Plans:

1. The location of light standards: new and existing.
2. The light standard number for new luminaires.
3. The location of the power source: whether new or existing.
4. The layout of the conduit and electrical circuitry.
5. The mounting height for new luminaires: for existing if being relocated.
6. The mast arm length for new luminaires: for existing if being relocated.
7. Base requirements, fixed or slip, for new luminaires: for existing if being relocated.
8. Conduit size and fill for new installation: for existing affected by, or affecting, the project.
9. Service cabinet requirements for new: or modifications to existing.
10. Junction box locations and types for new: for existing affected by, or affecting, the project.
11. Luminaire light source, distribution, and voltage for new luminaires.
12. All other features unique to the specific project.

400.06(23)(b) Stationing and Offsets

Stationing and offsets, shown in the foundation schedule for light standard locations, are to be reasonably accurate to ensure the design light levels are achieved.

400.06(24) Traffic Signal Plan

Traffic Signal Plans are normally provided by either the Region Traffic Office or the HQ Traffic Office, and the designer simply incorporates them into the project. The Traffic Signal Plans will follow the guidelines in the [Design Manual](#).

400.06(25) Intelligent Transportation System Plan

See Contract Plan [Example 4-57](#).

The Region Traffic Office normally provides Intelligent Transportation Systems (ITS) Plans, and the designer simply incorporates them into the project. ITS design criteria is found in the [Design Manual](#).

Provide the appropriate base maps to the HQ Traffic Office showing the locations of all new and existing features, such as utilities, drainage pipes, and structures, so that these features can be taken into account during the initial design. Keep the traffic designer aware of all design revisions made to the plans from the time the initial layout was given to the traffic designer.

400.06(26) Sign Specification Plan Sheet

See Contract Plan [Examples 4-58 and 4-59](#).

Prepare Sign Specification Plan sheets as 11-inch by 17-inch sheets plotted from CAD or an Excel program.

A separate Sign Specification Plan sheet will normally be prepared for the installation of new signs, the removal of signs, and the relocation of signs. If the signing work is minor, it is permissible to combine the different types of work on a single sheet, but there should be a distinct, identifiable section of the sheet for each type of work presented.

There will be a separate sign-numbering system for each of the three types of signing work, and each will be continuous from the beginning of the project to the end.

The Sign Specification Plan sheets are to be completely filled out.

Remember that the material stock used for the signs comes in 48-inch by 96-inch sheets, so sign sizes need to be adjusted to make the most efficient use of the stock material. The following guidelines should be used:

- For signs having a horizontal dimension of 48 inches or less, specify all dimensions in inches.
- For signs having a horizontal dimension of greater than 48 inches, specify all dimensions in feet and inches.

Wood posts are to be called out as nominal dimensions. A 4 x 4 (the common name for a 3-1/2" x 3-1/2" piece of lumber), 4 x 6, and so on, as long as there is no reference to inches.

When a sign installation requires multiple steel posts, specify which base type is to be used (see the [Standard Plans](#) for each multiple-post installation).

400.06(27) Signing Plan

See Contract Plan [Examples 4-60, 4-61, 4-62 and 4-63](#).

Signing design criteria is found in the [Design Manual](#).

Signing will always be shown in a plan view; however, assess the need for the Signing Plan series. In many cases, there are not sufficient signs to require a separate series of plans. In these cases the signing information can be combined with another series, such as the Paving/Pavement Marking Plan series, without affecting the clarity of the overall plan.

Signing Plans do not normally require a great deal of roadway detail. The centerline and edge of the roadway is normally all that is required for two-lane highways. For multilane highways, additional detail and roadway information may be required.

For region-wide signing projects, where an extensive area is covered, a smaller scale (even a strip map) can be used for directional sign placements. However, even in these instances, larger-scale details may be required to show sign installations at intersections and other areas where there are numerous signs being installed in a small area.

Signs will be located in the plans and identified using the plan sign number. For new installations, the plan sign number will be enclosed in an oval. The plan sign number for sign removals will be enclosed in a rectangle and "R-" will precede the number. Sign relocations will show both the original and relocated locations of the sign and the plan sign number will be enclosed in a square. There will be a leader line from the plan sign number to the sign location.

Sign relocations will have two leader lines: a dashed line from the plan sign number to the original location and a solid line from the plan sign number to the relocated location.

Show the following on the Signing Plans:

- Construction centerlines—all that is required for signing, such as destination and speed limit.
- Basic roadway layout in areas where detail is required, such as intersections with considerable signing.
- Sign locations.
- Small-scale layout of directional and special signs, showing required details, such as where upper- and lower-case lettering is to be used, location of directional arrows, and so on. Details may be placed on a separate sheet to avoid overcrowding of the plan.
- Small-scale layout of standard control signs may be shown in the plans. This can be very helpful to both the contractor and the inspector.
- Plan sign number with leader line pointing to sign location.
- WSDOT Sign Fabrication code number adjacent to plan sign number.
- Signs to be installed.
- Signs to be removed.
- Signs to be relocated. Show the sign locations for both the original, using a dashed leader line, and the relocated, using a solid leader line.
- Power source for all illuminated signs. If the source is coincidental to an illumination or traffic signal system and shown on those plans, a construction note referencing the sheet where the source is identified will suffice.

400.06(28) Signing Details

When overhead signs are being installed on a sign bridge or cantilever structure, show the following information on the Sign Specification and/or Sign Detail:

- Simple drawing of the new structure and signs
- Distance between signs
- Distance between signs and end supports or posts
- Location of overhead signs in relation to lanes
- Sign light spacing, when sign light(s) are required
- Maintenance walkway position
- Other data called for in the plans

400.06(29) Bridge Plan

Bridge Plans are prepared by the HQ Bridge and Structures Office. The designer may be required to provide field information for use by the HQ Bridge and Structures Office during the design. Required data/guidelines are shown in the [Design Manual](#).

Most projects with bridge construction will have items of work required because of the bridge work, but are indicated on the Bridge Plans as “not included in bridge quantities.” Provide the required PS&E information for these items.

Following are some of the items typically “not included in bridge quantities”:

- Drains
- Gravel backfill for drain
- Gravel backfill for wall
- Underdrain pipe behind or around abutments or walls
- Drain pipe in embankments at bridge ends
- Utility conduits and anchorage
- Slope protection
- Concrete barrier
- Guardrail connections

The bridge designer will provide a list of items that are not included in the bridge work.

400.06(30) Traffic Control Plan

See Contract Plan [Examples 4-63 through 4-77](#).

As required in the highway administration rules and regulations ([23 CFR 630 Subpart J](#)), every project shall have a Transportation Management Plan (TMP) with a minimum requirement being Traffic Control Plans (TCPs) and Contract Provisions for non-significant projects (see Design Manual Chapter 1010 for details). The TCPs may be typical, site-specific, or project-specific plans; most projects should include all three types to effectively address all work operations.

The [Plan Sheet Library](#) includes many typical TCPs to consider as a starting point for developing contract traffic control plans. TCPs in this library include full color and gray scale versions and may be included in the PS&E in either format. The “old” traditional wire frame type plans are still acceptable for use (but update the work zone tables at a minimum). Work zone Cell libraries have been updated to full color cells. These are programmed to automatically print in gray scale when printing in black and white. The work zone sign background shall not be deleted. Addendums will be highlighted via a cloud. Tabular addendums will still be shaded (see [Appendix 5](#) for details.) The [Work Zone Traffic Control Guidelines Manual for Maintenance Operations](#), and figures in the [MUTCD Part 6H](#) have additional examples, though not specifically intended or appropriate for contract use.

Contract TCPs need to provide a biddable and constructable method for managing road user impacts and completing the work with a primary consideration for public safety, worker safety, and maintaining mobility for vehicles, bicyclists, and pedestrians (including pedestrians with disabilities) through or around a work zone. (See the [Design Manual](#) for further guidance.) The contractor is required to adopt the contract plans in writing or develop their own for the Engineer’s acceptance per [Standard Specifications](#). Because of the complexity of balancing public and worker safety, maintaining a level of mobility and project constructability, TCPs need

to be developed with a great deal of thought by a designer with an understanding of all the project features to be constructed, how they will be constructed, as well as an understanding of temporary traffic control principles and requirements. The TCP designer should be aware of any design changes to ensure the TCPs developed will still address all the project's work zone impacts.

Bid item(s) need to be included for all devices shown on the TCPs and specific traffic control labor items like flaggers, Traffic Control Supervisor, and other traffic control labor. The standard specifications may need to be revised or supplemented with General Special Provision (GSPs) or project special provisions to include all items or revise standard item use. Review the TCPs to ensure all items required for traffic control and bidding are shown as either separate bid items or included in bid items for a lump sum bid if approved by the proper delegated authority.

TCP Notes and Legends: It may not be practical due to space limitations to place legends and notes on every sheet. Therefore, it is acceptable to place the legend and notes on the first TCP of a set in a series or the first sheet of TCP in the PS&E.

400.07 Example Plan Sheets

This section provides examples of typical PS&E plan sheets showing general plan requirements.

These examples are strictly for informational purposes. Final approval of plan sheets will be in accordance with this manual and the Region Plans Review Office.

