

Washington State Department of Transportation, WSDOT

Northwest Region, NWR

Quality Management Plan for Design

Approval:

Name	e-signature	date
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May 2020



Northwest Region Design Bid-Build Quality Management Plan

Purpose:

The primary goals of this process are to provide a technical review of project plans and documents by a qualified staff member(s), to allow the designer or author of the plan or document and the checker to come to a consensus on any changes, and to make certain any needed changes are made correctly and timely.

The QMP is based on the philosophy that:

1. Quality will be advocated from the top down and the bottom up.
2. Quality is achieved by adequate planning, scoping, communications and coordination, supervision, and technical direction; by providing adequate time in the schedule for thorough reviews; by proper definition of job requirements and procedures; by the use of appropriately skilled personnel; and by individuals performing their work functions with diligence.
3. Implementing quality processes early and throughout the development of the project will ultimately save time and help to avoid costly errors and/or scheduling delays.
4. Quality is enhanced through documented reviewing and checking procedures.
5. Quality is improved by having the NWR Plans office verify that the quality control process and documentation were properly completed.

Process:

The Quality Control Check Process may be the process described below or as determined by the Project Engineer. The process described below must be used at 100% turn-in (prior to submittal to Northwest Region Plans Office) and may be used at the 30%, 60%, and 90% stages of review. It is recommended that the quality control process be used more often on complex projects. The quality control process will be a topic at the Kickoff meeting and concurred by the Design Engineering Manager.

Documentation of the project specific approval of the quality control checking processes will be kept in the project file until the Contract is awarded.

The core of the Quality Control Check Process will include checking, correcting, and verifying that the corrections have been made.

The following are typical plans and documents which are subject to this checking process:

- Construction plans
- Special provisions
- Design and quantity calculations
- Design document (for example, design exceptions, design memos, Public Interest Findings, Resurfacing Reports, Foundation Reports.....)
- Cost estimate
- Schedule

Personnel and Duties

Originator: The Originator is the author of the plan or document. The Originator will have the primary responsibility for accuracy and adequacy.

Checker: The Checker (PEO Co-Designer or Support Group Co-Designer) will be responsible for checking the plan or document independently of the Originator (the Checker must not have prepared the element being checked). In many cases, the Checker can also function as the Verifier. For plans, calculations, specifications, special provisions, and design documents, the Checker will be a qualified person with sufficient knowledge and experience in the discipline of the work being checked.

For computer program input and output, the Checker will be skilled in the use of the design software being used. Hand checks of random inputs and outputs is highly encouraged.

Organization Manager: The Organization Manager will be responsible for resolving any outstanding differences between the Originator and Checker.

Corrector: Correction of the plan or document will be completed by the Corrector, who may be the Originator or other personnel (as appropriate). The Corrector will be an individual working under the person assigned to stamp the element being reviewed.

Verifier: The Verifier (can be the Checker) will be responsible for confirming that corrections have been accurately made.

Northwest Region Plans Office (NWRPO): The NWRPO will coordinate with the Organization Manager that the Quality Assurance verification process has been followed and is complete.

Support Groups: Those offices outside the Project Engineers Office that provide plans and subject matter experts for inclusion into the project.

Quality Control Process

1. At each of the Region review stages, the **Originator** will prepare the package and documentation for submission to the Region by the Project Engineer. (See *NWR PS & E page on the Intranet for direction*)

<http://wwwi.wsdot.wa.gov/Northwest/psereview.htm>

On the submittal, the Originator will make sure that all plan sheets are appropriately numbered or that the pages of all other documents, including calculations, are sequentially numbered. (numbering of plan sheets is only needed for the 100% submission) The Originator will fill out the top of the Quality Control Check Process Form (included in the appendix). The form will be attached to the submittal. The Originator will sign and date the Quality Control Check Process Form and provide the completed package to the Checker.

2. The **Checker** will check the plan or document and record the checking activity on the documents being reviewed. Information found to be incorrect or needing updating will be noted. Regardless of the marking/checking style used the markings must clearly show that the checking occurred.

For calculations, the Checker will thoroughly check the calculations including assumptions, mandated parameters, references, given values, and formulas; check for omissions and accuracy of arithmetic; ask questions of the designer in areas that are not clear or where additional calculations are required; seek technical advice if unsure of any particular element of the calculation; and review the output data of computer calculations for consistency with expected results. For computer program input and output, the Checker will thoroughly check the input parameters and all assumptions, references, and mandated values.

For plans, the Checker will use the appropriate plan review checklists. The Plans-Plans Preparation Manual contains guidance on standards for plans.

<http://www.wsdot.wa.gov/Publications/Manuals/M22-31.htm>

The Checker will check the entire drawing for design intent, technical adequacy, and conformance to any applicable standards and format. The Checker will be responsible for determining that the drawing is consistent with the corresponding calculations and for affirming that those calculations have been properly checked. The Checker will also check to ensure that all relevant design documents have been incorporated. For specifications and special provisions, the Checker will review the document for applicability and clarity. The Checker will review the entire document, even if only a small portion has changed, to ensure that revisions have not introduced conflict or ambiguities. The Checker will also review the special provisions together with the plans to ensure that all necessary pay items have been covered, that the pay item units are correct, and that the plans and special

provisions are consistent. The Checker will also check to ensure that all relevant design documents have been incorporated.

For design documents, each Checker will place their initials next to their comments or corrections. Checkers will review the document with regard to their responsible area, conformance with project criteria and requirements, and content. They will also review those parts of the document that interface with their area of responsibility to assure that there are no conflicts.

Following the checking, the Checker(s) will sign and date the Quality Control Check Process Form and provide the submittal and the form to the Corrector.

3. The **Corrector** (often the originator) will make the changes to the plan or document based on the Checkers and record each correction as incorporated. When all of the corrections have been reviewed and addressed, the Corrector will sign and date the Quality Control Check Process Form. A new copy of the corrected plan or document and the marked-up Check Print will be provided to the Verifier.
4. The **Verifier** (can be the checker) will compare the new copy of the plan or document with the original submittal and comments to confirm that the agreed-to corrections have been incorporated without error. Once all corrections have been properly made and verified, the Verifier will sign and date the Quality Control Check Process Form.
5. The **Organization Manager** (OM or Project Engineer/Asst. Project Engineer) will review each of the Checker's corrections. If the OM finds any additional changes not noted up by the Checker the OM will confer with the Checker and, with the concurrence of the Checker, will add the additional changes. If the OM is not in agreement with a Checker's correction, the OM will confer with the Checker. If both agree that the Checker's correction should not be made, the OM will cross out the Checker's correction. When satisfied with the submittal the OM will sign and date the Quality Control Check Process Form and route the package for Region Review.

Support Groups

Support offices who will be submitting plans and specifications to the Project Office for inclusion in the project will perform the Originator and Check process described above. These products will be submitted a minimum of 1 week prior to distribution for the prescribed constructability review. For each submission, the support office/subject matter expert will submit the Quality Control Check Process Form verifying the quality process has been performed.

Preliminary Region Review (30/60/90)

If, at the Kickoff meeting, it has been determined that the Project utilizes a 30%, 60% and/or 90% review, those efforts will be led by the Project Office. The following is a list of checklists that could be utilized that can be used to assist in determining what

documents should be expected at each stage of review:

Plans-Plans Preparation Manual

<http://www.wsdot.wa.gov/Publications/Manuals/M22-31.htm>

30%, 60%, and 90% content Review Checklists

www.wsdot.wa.gov/NR/rdonlyres/89326A0C-B150-4295-8C4E-8CE04E0CD6CC/0/Con_RP.pdf

Expected contents of the project documents for the various review stages is found in the *Deliverable Expectation Matrix*

http://www.wsdot.wa.gov/publications/fulltext/ProjectMgmt/DEM/DE_Matrix.pdf

In the case of 30/60/90 Review, the Project Office, not the NWRPO, will be responsible for ensuring that the submission is sent for review to all interested parties and subject matter experts.

100% SUBMITTAL

Plan and Document Submittal and Filing

When all project plans and documents have been checked, the Project Engineer will file the Quality Control Check Process Form into the project file and submit the plans, special provisions, cost estimate and Quality Form(s) to the NWRPO.

Quality Assurance Verification

The NWRPO will review the Quality Control Check Process Forms to verify the quality control procedures described in steps 1-5, above, were implemented. The NWRPO reviewer will coordinate with the Project Engineer (or others as appropriate) to resolve all issues arising from the quality assurance verification.

Once the verification is complete and any nonconformance issues have been resolved, the NWRPO reviewer will sign and date the Quality Control Check Process Form. The completed form will be kept in the Project Files.

Proof Copy (Pre Advertisement)

Proof Copy will follow the process above for 100% submittal. When all contract docs have been compiled the Quality Control Check Process Forms from the Project Office and the Support Groups for Proof Copy will be submitted to the Design Engineering Manager to verify the quality process has been followed.

Region Special Provisions

A Region Special Provision is a modification to a Standard Specification, can be used on any NWR project and needs no further approval when used.

In conjunction with the Plans Preparation Manual and HQ Construction guidance, below is the process for approval of all Northwest Region Special Provisions. This applies to any and all Northwest Region Special Provisions that supplement or revise the Standard Specifications, make changes to Statewide or previously approved NWR General Provisions (RSP's).

The process below is sequential, requiring resolution and approval at each step before proceeding to the next.

1. The NWR Plan Review office shall coordinate with the proposing NWR Office for content and format correctness in the writing and all revisions of the RSP. The proposing office and Plan Review will coordinate with other effected support groups. NWR Plan Review will coordinate with the State Construction Office and the HQ ASCE.
2. The NWR Plan Review office will then send the proposed RSP to the Design Project Engineers, Construction Project Engineers, Design Engineering Mangers and Construction Engineering Mangers for review and approval. After 1 week the process will proceed to the next phase. Any comments made by the PE's and EM's will be incorporated and/or resolved before their final approval.
3. Following approval by the Project Engineers and Engineering Managers the RSP will be submitted for final region review and approval to the Assistant Region Administrator(s) for Design and Construction for Sno-King and Mt. Baker. Any comments made by the Assistant Region Administrators will be incorporated and/or resolved before their final approval.
4. After the NWR Special Provision has been approved by NWR they will be approved at the HQ level. HQ approval will be by the ASCE.

After final approval the NWR's Index will be up dated and available for use in all NWR projects. All approved NWR Special Provisions will have an approval date in the heading.

Project Special Provisions

After the Proof copy has been distributed, reviewed and comments evaluated the Project Special Provisions will be submitted to the Project Engineer(s) for Design and Construction. Once accepted by the Project Engineer(s), the provision will be submitted to the Construction and Design EM's for approval. Once the Project Special Provisions have been approved by the PE(s) and EM(s), the provisions will be submitted by the Project Engineer to the HQ ASCE for approval.

QUALITY CONTROL CHECK PROCESS FORM

Project Engineer: _____

Design Team Leader: _____

Project No.: _____

Project Description: _____

Project Status _____

Originated by: _____

Print name

Sign

Date

Checked by: _____

Print name

Sign

Date

Corrected by: _____

Print name

Sign

Date

Verified by: _____

Print name

Sign

Date

Quality Assurance Verification by Project Engineer:

Sign

Date

Quality Assurance Verification by Northwest Region Plans Preparation Office:

Sign

Date

Performance Measures:**1. Addendums**

The number of plan change addendums will be monitored. Emphasis on collaboration and checking should lead to a decrease in the number of “Plan Error” addendums.

2. Change Orders

The number of plan error change orders will be monitored. Emphasis on collaboration and checking should lead to a decrease in the number of “Plan Error” addendums.

Lessons Learned:

The Northwest Region Engineering Managers shall facilitate an annual meeting of construction and design Project Engineering Offices. Included with this invitation shall be Support Offices and HQ Subject Matter Experts. The goal of this workshop will be to discuss lessons learned, best practices, and potential improvements to guidance's. Also included can be a discussion of the trends of our measures.