

# Quantity Calculations Guidelines

## Calculating and Quantifying



This document will be periodically updated based on latest guidance as well as issues discovered in the field. Any comments, questions or concerns regarding the content of this document should be brought to the attention of:

Michael Nauman, P.E.  
Design Resource Engineer – Project Development, North  
800 Bay Road  
Dover, DE 19903  
(302)-760-2218  
[Michael.Nauman@state.de.us](mailto:Michael.Nauman@state.de.us)

## General

It is essential that the design project engineer correctly calculate and quantify all contract items required to complete the work included in the contract as per plan. Not properly quantifying or calculating the contract bid items can lead to costly field changes. For this reason, a Quantity Calculations document must be generated at plan milestones in accordance with the requirements of the latest version of the [Plan Submission Checklist](#).

The Quantity Calculations document will ultimately be provided to the Construction Inspection personnel assigned to the project who will use the document to understand how the design project engineer calculated the quantities for specific operations and to understand how a quantity is split between multiple operations. This document will also allow the Construction Inspection staff to be able to quickly and easily determine if an item of work was included or missed in the engineer's estimate.

This document was created to assist the design project engineer in creating a clear and concise Quantity Calculations document. This document is not intended to be a substitute for reading and understanding the Standard Specifications, Supplemental Specifications and any pertinent Special Provisions. The Standard Specifications, Supplemental Specifications and Special Provisions are standalone documents and this guidance is only meant to complement those documents and to assist the design project engineer when creating a project's Quantity Calculations document.

Accordingly, several best practices when creating the Quantity Calculation documented are listed below:

- The design project engineer and the design project manager must review all contract documents to ensure that there are no inconsistencies in the contract documents.
- All items that are included in the contract should have an associated quantity. For example, if a bid item is provided on the Project Notes sheet, an associated quantity should be included in Quantity Calculations document.
- When Special Provisions are to be used on a contract, the design project engineer and the design project manager must thoroughly read the Special Provision and work with the Design Resource Engineer, the Area Engineer as well as the Specifications Engineer to ensure there are no conflicts.
- It is typically best practice to try to reduce the amount of work which is made incidental to other items. This provides a better price history as well as a more consistent contract document. Where some items of work are incidental to others, the Quantity Calculations should clearly note which items were considered incidental.
- Review the Method of Measurement and the Basis of Payment for the items used on a project to determine what work is considered incidental to other work. For example, the Graded Aggregate Base Course underneath of proposed curb is paid under the curb item.
- Lump sum items are some of the hardest items to attempt to estimate. These items require familiarity with previous contracts in both scope and size in order to determine an accurate price history.

## Quantity Calculations Document Requirements

The following discussion is intended to guide the design project engineer in establishing a thorough and uniform Quantity Calculations document. Due to the importance of this document, the design project manager must review the Quantity Calculations document to ensure its accuracy.

In general, the Quantity Calculations document should be neat, thorough and organized in a logical order that inspection staff will be able to follow. The entire document should be created in a PDF file that is available to be printed and distributed as a hard copy when requested. The Quantity Calculations document should contain the following items in order:

### Title Page:

- The title page must contain the following information:
  - Contract number
  - Project title
  - Primavera number
  - The estimator's name (typically the design project engineer)
  - The reviewer's name (typically the design project manager)

### Total Project Cost Summary Sheet:

- Include a completed [Total Project Cost Summary](#) Sheet. Use the latest version on the Design Resource Center.

### Estimate Summary Sheet:

- Include a contractor items summary table which includes the following:
  - A listing of the contractor bid items utilized on the project typically listed by ascending item number. Both the item number and the item name should be included.
  - The contractor bid item's unit of measure.
  - A calculated quantity for each contractor bid item.
  - An estimated unit price for each contractor bid item.

### Construction Plan Quantity Calculations Sheets:

- The quantity calculations sheet should be broken out by Construction Plan sheet to make it easier for review and also easier for Construction Inspection staff to track in the field. For smaller projects with three Construction Plan sheets or less, the design project engineer may quantify all quantities on one worksheet.
- In addition to breaking out quantity calculations by Construction Plan sheet, the quantities should also be broken out by stationing for tracking purposes.
- The quantity calculations should follow a logical progression and typically follow the numerical sequence of the contractor items.
- Units must be shown for each quantity. When unit conversions are required, the calculations must be shown completely in order to assist in review.
- It is preferable that these sheets be created through Microsoft Excel or Mathcad, however, other programs or hand written calculations are allowable as long as they are neat and legible.

### Other Quantity Calculations Sheets:

- Some items of work in a contract are easier to quantify by breaking out separately from the Construction Plan Sheets. These items include but are not limited to the following operations:

- Earthwork
- MOT
- Traffic
- Utilities
- Bridge
- Landscaping

**Optional Appendices:**

- The design project engineer should include any appendices that they feel are relevant and helpful to the Construction Inspection staff.