This Quality Management Plan (QMP) template was created to provide guidance to contractors for writing a QMP in accordance with Article 1.05.03 of the July 2017 Supplemental Specifications to Form 817. It is also intended to be used as a guide for inspectors to review QMP submissions.

For reference, Article 1.05.03 is included below:

1.05.03—Conformity with Plans and Specifications (including Quality Control): The Contractor shall perform all work and provide all materials in conformity with the lines, grades, cross-sections, dimensions and material requirements, including tolerances, shown on the plans or indicated in the Contract specifications, or as directed by the Engineer.

Quality Management Plan: The Contractor shall be responsible for quality control and shall maintain and implement a written Quality Management Plan (QMP). The QMP shall document the overall internal quality control operating procedures for the Contractor to meet or exceed Contract requirements. The details of the QMP must discuss how the Contractor will ensure that:

- Work processes are performed efficiently and as documented
- Work processes out of conformance are quickly identified

- Corrective action is quickly taken to bring such work processes back into conformance

The QMP must include the following components:

- Identification of Contractor staff and their specific duties and responsibilities with regard to execution of the QMP
- Standard operating procedures and frequency of quality control inspection and testing used to measure quality before, during and after those procedures
- Action plan for reporting and reacting to nonconformance and quality control issues

The Contractor shall furnish a copy of the QMP to the Engineer prior to the start of the physical work. The Contractor must revise the QMP if, as determined by the Engineer, the Contractor's procedures prove to be inadequate or ineffective in producing work that meets the Contract requirements. Failure of the Contractor to comply with the provisions of this Article may result in a suspension of work in whole or in part. The Department will not grant the Contractor additional Contract time or compensation in connection with such a suspension.

Quality Management Plan (QMP) Template

Section 1 Description - Quality Control Organization

Identify the Contractor staff responsible for execution of the QMP. Staff identification should include Project Management, Frontline QC (Production Personnel) and Formal QC.

> Project Management: The Project Management Team could include the Owner, Project Manager and others that direct the work of production and QC personnel. All members of the Project Management Team must understand quality control concepts and responsibilities.
>
> Frontline QC: While the primary function of the Construction Production Team (superintendents, foremen, skilled craftspeople, operators, and laborers) is to produce or install specific items of work, they must also be responsible for performing Frontline QC through self-inspection.
>
> Formal QC: The QC Team is responsible for performing Formal QC activities independent of the Construction Production Team. These "Formal QC" activities include "independent-checks" throughout the construction process to confirm the quality of materials and workmanship being provided and to confirm that each production and placement process is functioning as planned.

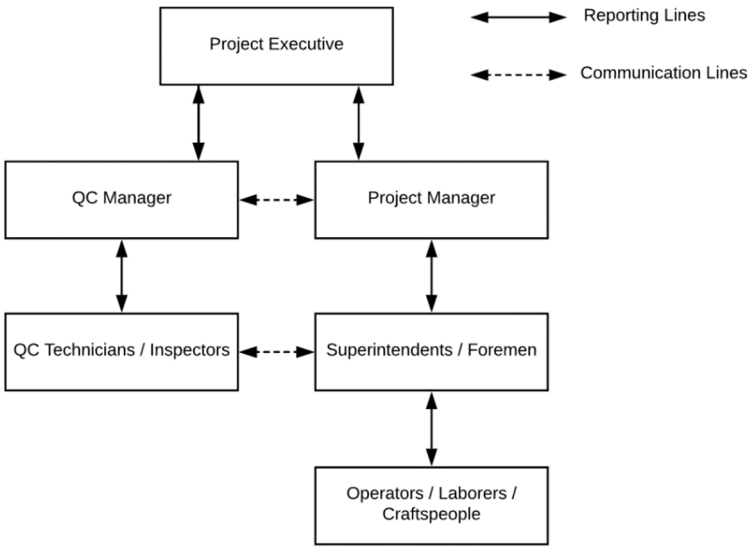
The specific roles and responsibilities of these key personnel should be provided. Personnel responsibilities should clearly indicate the levels of authorization to enforce hold points on the work, as well as contact information for each individual identified. An organizational chart should be included to show the staffing structure and separate reporting and communication lines of the Formal QC Team and the frontline Production Personnel.

The recommended outline for Section 1 is as follows:

Section 1 – Quality Control Organization

1.1 **Introduction to Quality Control Organization** – provide a short narrative explaining the understanding that Organization (e.g., clear reporting lines, roles, Frontline vs Formal QC) is critical in achieving quality

1.2 **Organizational Chart** – identify the specific individuals in a chart like the one below:



1.3 **Roles and Responsibilities Narrative** – provide names, contact information, roles and responsibilities of each individual included in the organizational chart

Quality Management Plan (QMP) Template

Section 2 Description – Applicable Specifications

A list of specifications should be presented in order to facilitate lookup and review of pertinent information that sets the quality standard. Examples of such applicable specifications include:

- Standard Specifications
- Supplemental Specification
- Special Provisions

The recommended outline for Section 2 is as follows:

Section 2 – Applicable Specifications

2.1 Introduction to Applicable Specifications – provide a short narrative explaining the understanding that specifications set the quality standard
2.2 Standard Specifications – identify the Standard Specifications that apply to the project (e.g., Form 817)
2.3 Supplemental Specifications – identify the Supplemental Specifications that apply to the project (e.g., January 2018 Supplements to Form 817)
2.4 Special Provisions – provide the list of Special Provisions that apply to the project, including item numbers

Quality Management Plan (QMP) Template

Section 3 Description – Materials Control

The source(s) of all constituent materials (Project Produced, Fabricated Structural, or Standard Manufactured materials) planned to be used should be listed in this Section.

> Project Produced (PP) Materials: Major items produced directly for an individual construction project either by a Contractor or by a material Producer. Examples: earthwork, subbase, base, HMA, concrete
>
> Fabricated Structural (FS) Materials: Major structural items produced specifically for an individual construction project by a material Fabricator. Examples: Structural Steel, Precast and/or Prestressed Concrete Elements (box culverts, prestressed bridge beams)
>
> Standard Manufactured (SM) Materials: Standard items that are produced routinely (i.e. not for a specific project) by a Manufacturer. Examples: Ductile iron pipe, geotextile fabrics, standard steel shapes or products (anchor bolts, sheeting, rebar)

It is critical to understand that QC inspection and testing should focus on PP and FS materials due to their customization and higher level of risk. SM materials should still be periodically checked for quality but the risk of substandard quality is much lower.

The QMP should also provide information on the items that require mix designs and should address the procedures for shipment and storage of the constituent materials in order to "control" the quality of the materials being provided prior to production and installation. In summary, Materials Control information should address:

- Material Types and Sources of Supply
- Mix Designs
- Material Storage and Stockpiling

The recommended outline for Section 3 is as follows:

Section 3 – Materials Control

3.1 Introduction to Material Control – provide a short narrative explaining the understanding that material control is critical in achieving quality

3.2 Material Types and Sources of Supply – provide lists of each type of material (PP, FS, SM) and indicate the source of material for each (consider attaching CON-083 but note that the CON-083 does not include all materials and this list should be all-encompassing)

3.3 Mix Designs – identify the items that require mix designs and the design criteria that must be met

3.4 Material Shipment, Storage and Stockpiling – identify the locations and procedures for shipment, storing and stockpiling materials

Quality Management Plan (QMP) Template

Section 4 Description – Quality Control Standard Operating Procedures (QC SOPs)

This section contains the bulk of the QMP. It should include QC SOPs and frequency of quality control inspection and testing used to measure quality before, during and after those procedures. Quality control inspection involves visual observations and check measurements for specific characteristics or 'Attributes'. Quality control sampling and testing provides measurements of specific materials properties or 'Quality Characteristics' to determine the degree of materials uniformity or variability during production or placement. QC testing data is necessary to identify whether a specific production or placement process is "in control" and, therefore, to provide information to guide Formal QC Team staff in making adjustments or corrective actions to the process.

> Attribute – A characteristic that, by its presence or absence, classifies an item as conforming or nonconforming. Attributes are assessed using both visual observations and check measurements. Inspection attributes should address each of the four major inspection components: equipment (e.g., paver screed settings), environmental conditions (e.g., concrete form cleanliness), materials (e.g., temperature of delivered HMA mix), and workmanship (e.g., reinforcement bar layout).
>
> Quality Characteristic – A product characteristic that is measured through testing, either for QC purposes or for conformance with Acceptance requirements. Quality characteristics are selected because they are good indicators to monitor and control production. They also contribute either directly or indirectly to the long-term performance of the product. Some examples of quality characteristics for concrete are slump, air content and compressive strength. Some examples of quality characteristics for hot-mix asphalt are in-place density, air voids and ride quality.

To satisfy these requirements, Section 4 should describe the QC SOPs for each "Major Work Category" (such as Steel Piles, Bridge Substructure - Concrete Elements, HMA Pavement, etc.) including all elements that comprise the Major Work Category. This is to ensure that the QC activities for the Major Work Category (material production, transportation & installation/workmanship) are adequately addressed. This also provides the Agency and the Contractor a forum to discuss the Contractor's QC procedures before work begins on a Major Work Category. Furthermore, it is intended to be used throughout the work in conjunction with the project specifications. Overall, each description of Major Work Category SOPs serves as a tool to ensure that the Contractor has adequate personnel, facilities, equipment, and QC procedures in place to achieve the specified product Quality for each Major Work Category.

Some examples of Major Work Categories include the following:

- Steel Piles
- Drilled Shafts
- Bridge Substructure - Piers & Abutments
- Bridge Superstructure - Girders & Bearings
- Bridge Superstructure - Bridge Deck, Median & Parapets
- Earthwork
- Roadway Subbase & Base
- HMA Pavement
- Drainage Systems
- Concrete Median Barrier
- Safety Hardware
- Traffic Control Systems
- Landscape Elements

Quality Management Plan (QMP) Template

The recommended outline for Section 4 is as follows:

Section 4 – Quality Control Standard Operating Procedures (QC SOPs)

- **4.1 Material Quality Control Procedures**
  - **4.1.1 Project Produced Materials**
    - **4.1.1.1 Applicable Project Produced Work Items**
    - **4.1.1.2 QC Inspection Schedules (Attributes, Lot/Sublot Sizes)**
    - **4.1.1.3 QC Testing Schedules (Quality Characteristics, Lot/Sublot Sizes)**
    - **4.1.1.4 QC Documentation & Data Analysis**
  - **4.1.2 Fabricated Structural Materials**
    - **4.1.2.1 Applicable Fabricated Structural Work Items**
    - **4.1.2.2 Fabricator Quality System Manuals (Fabricator QC Inspection & Testing)**
    - **4.1.2.3 Project Site QC (Inspection & Testing Schedules)**
    - **4.1.2.4 QC Documentation**
  - **4.1.3 Standard Manufactured Materials**
    - **4.1.3.1 Applicable Standard Manufactured Work Items**
    - **4.1.3.2 Manufacturer Quality System Manuals – AASHTO R38**
    - **4.1.3.3 Project Site QC (Review of Certified Test Report (CTR) or Materials Certificate (MC))**
    - **4.1.3.4 QC Inspection (at delivery, during storage & at installation)**
    - **4.1.3.5 QC Documentation**
- **4.2 Major Work Categories QC SOPs** (repeat Section 4.2 for each Major Work Category, subsequent sections should be labeled 4.3, 4.4, 4.5, etc.)
  - **4.2.1 Quality Control Activities by Construction Production Personnel**
    - **4.2.1.1 Pre-Production & Pre-Placement Checks**
    - **4.2.1.2 Self-Inspection During Work Item Production and Placement**
  - **4.2.2 Quality Control Activities by QC Team**
    - **4.2.2.1 QC Team Review of Plans and Specifications**
    - **4.2.2.2 Review of Construction Submittals Prior to Release**
    - **4.2.2.3 Development and Review of QC Inspection, Hold Points & Testing Schedules**
    - **4.2.2.4 Development and Review of QC SOPs for Major Work Categories**
    - **4.2.2.5 QC Inspection at Production Facilities and at Field Placement**
    - **4.2.2.6 QC Sampling and Testing at Production Facilities and at Field Placement**
    - **4.2.2.7 Documentation of QC Inspection and QC Testing Results**
    - **4.2.2.8 Maintenance of QC Record Books and QC Database**
    - **4.2.2.9 Analysis of QC Inspection Data & QC Testing Data**
    - **4.2.2.10 Providing Feedback to Construction Production Personnel**
    - **4.2.2.11 Process Adjustments and Corrective Action Implementation**