

## Section 10 - Estimated Quantities/Design Calculations

### 10.1 Plans

1. Estimated quantity tabulations shall be shown on plans.
2. Each bridge plan detail sheet shall have the following type of tabulation, which represents the quantity of contract pay items shown on that sheet:

Quantities				
Sequence No.	Item No.	Description	Unit	Contract Quantity

3. The General Plan and Elevation sheet shall have the following type of tabulation which represents the total quantities of the individual plan sheets and, consequently, the total quantities for the bridge or structure.

Summary of Quantities				
Sequence No.	Item No.	Description	Unit	Contract Quantity

4. Each bridge design unit shall obtain from the roadway design unit the last roadway sequence number to facilitate the bridge item sequence numbering.
5. Quantities on these sheets shall be listed on an individual bridge or structure basis. Retaining walls shall be summarized on a total quantity for all walls in the contract. However, the quantities for the individual walls shall be included in a separate tabulation.
6. Overhead and Cantilever Sign Structures shall be listed on an individual lump sum basis; however, the items for clearing site, foundation excavation, concrete for footings, temporary sheeting and reinforcement steel shall be listed as the total summary for all sign support structures in the contract.

### 10.2 Calculations

1. Estimated quantity calculations are required as part of the Final Plan Submission. They shall be on 8½ inch by 11 inch sheets bound in a separate folder (from the

design calculations). Each sheet shall be initialed by the estimator and the checker.

2. The required submission of bridge quantity calculations at the Final Submission shall also include schematic drawings of all concrete structures.
3. The volume of concrete in each individual unit shall be noted on the schematic drawings. The sheets shall be bound into the folder following the index. This will facilitate pinpointing any mistakes or errors during construction when Quantity calculations are made for purposes of monthly payments.

### **10.3 Guidance On NJDOT Standard Specifications Pay Item Usage**

The *NJDOT Standard Specifications for Road and Bridge Construction* provide Pay Items for work on bridges and structures. The following guidance may be followed for pay item selection:

1. The item Clearing Site Bridge is used when a "bridge" is involved, either partial or total removal.

The item Clearing Site Structure is used when a "structure"; such as, culverts, walls, etc. is involved, either partial or total removal. In addition, when it is determined that certain components are to be salvaged and remain the property of the State, provisions in the Plans and/or the Supplementary Specifications are required.

2. Hot Mix Asphalt (HMA) overlays with membrane waterproofing may be used in bridge deck rehabilitation projects.
3. An item for porous fill is usually listed with the roadway items of work.
4. Payment line limits for Excavation Work shall be shown on the Plans in accordance with Guide Sheet Plates 3.15-1 to 3.15-5 of this Manual.
5. See Section 33 of this Manual for guidance concerning Cofferdams, Sheet piling Left in Place and Sheet Piling.
6. For Structural Steel use the lump sum method of payment. A per pound pay unit method may be considered for the occasional project where there is a possibility that significant changes can occur during construction; such as, on repair or rehabilitation projects.
7. See Section 34 of this Manual for guidelines as to when Prebored Holes should be scheduled.
8. Schedule Pile Load tests on a project to project basis only if required in the Foundation Report.
9. Pneumatically Applied Mortar is usually scheduled under the square foot pay unit method. Per bag pay unit method should be considered for rehabilitation projects where there is the possibility of significant changes in the extent of repair areas.
10. See Section 30 of this Manual concerning sign support structure work.
11. The estimated quantity for utility conduits shall be the total length of all conduits in the bank.
12. See Section 7 of this Manual for Temporary bridge presentation criteria.
13. Items are listed (for each bridge and/or structure in the Contract) in the order in which the items of work appear in the Standard Item listing of the

Contractor Payment Listing. Any additional bridge items which may be required (but which are not included in the provisions of the Standard Specifications) shall be included in the listing by the same criteria.

14. See Bridge Construction Details for details of RMC Expansion Sleeves and Junction Boxes.
15. An Underdeck lighting item is to be listed with electrical items of work.
16. Hand Power Tool Cleaning may be used for those projects where Epoxy Mastic surface preparation with Hand/Power Tool Cleaning is warranted and the effective steel is confined to limited areas.

#### **10.4 Design Calculations Criteria**

1. Design calculations shall be on 8 ½" x 11" sheets.
2. For both Consultant and In-House design projects, a single set of calculations will be included with the Project Files. Checker's corrections shall be made directly on the original set of calculations. Each sheet shall be signed by the designer and the checker.
3. Computer interpretation information shall be included in the design calculations in accordance with Subsection 14.1.
4. If changes are necessary in the Standard Contract Plan Plates for Sign Support Structures, half-size copies of the Plates shall be included with the calculations in accordance with Subsection 30.5 item 2.
5. The design calculations shall be bound in separate folders by individual bridges and structures. The front cover shall identify the contents with the following minimum information:

Route \_\_\_\_\_ Contract No. \_\_\_\_\_ County \_\_\_\_\_

Design Calculations For: \_\_\_\_\_

Design Unit \_\_\_\_\_

Structure No. \_\_\_\_\_