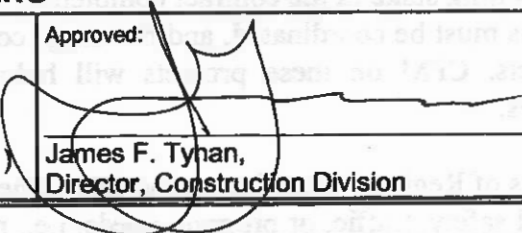


To: SUPERSEDED BY EB 11-010 EFFECTIVE 9/1/11		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 04-043
Title: DESIGN GUIDANCE FOR CPM SCHEDULING			
Distribution: ☐ Manufacturers (18) ☒ Local Govt. (31) ☒ Agencies (32) ☐ Surveyors (33) ☒ Consultants (34) ☒ Contractors (39) ☐ _____ ()		Approved:  _____ James F. Tyhan, Director, Construction Division Date <u>12-7-04</u>	

ADMINISTRATIVE INFORMATION:

- This EI is effective beginning with projects submitted for the letting of 05/05/05.
- The guidance provided in this EI for Designers will be incorporated into a future revision of Chapter 21 of the Highway Design Manual.
- This EI supersedes EI 04-008.

PURPOSE:

This EI transmits project selection guidance for item 637.3551--20 Critical Path Method (CPM) scheduling.

TECHNICAL INFORMATION:

This EI is being released concurrently with EI 04-042 which transmits the special specification for CPM Scheduling.

This EI provides project selection criteria for the inclusion of the special specification for a computer generated CPM schedule on selected contracts. The inclusion of the special specification for CPM scheduling requires Contractors to use CPM scheduling to plan and control their work on the selected contract.

CPM scheduling is appropriate for certain projects and its use during construction to plan and schedule work aids in the resolution of time-related issues and can help to avoid costly delays and help resolve delay disputes. Project selection criteria have been developed to identify those projects where CPM scheduling is most suitable.

Changes from the existing project selection guidance include the removal of guidance pertaining to the CPM Schedule Special Note. The CPM Schedule Special Note has been eliminated.

Project Selection Criteria.

Projects that meet any of the following criteria shall contain Item 637.3551--20.

- A. Projects that contain incentive/disincentive (I/D) provisions for early completion, projects that use cost-plus-time bidding (A+B bidding), lane rental, or have time-related contract provisions such as interim milestone dates or a contract completion date with significant liquidated damage provisions. Time is of the essence in contracts with these provisions, and time equates to direct monetary costs. CPM scheduling provides a rational method to measure time and the apportionment of both delays and advancements. For projects with very short I/D phases or

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limited, time-related work, the CPM may be required for only part of the project. The Designer should contact the Regional Construction Group to develop the appropriate special notes.

- B. Projects that require the Contractor to coordinate activities with utility companies, railroad companies, or other contractors. The other parties work must be significant to the extent that it has a controlling stake in the contract completion. This includes contracts let in stages where adjacent sections must be coordinated, and buildings constructed with multiple contracts, i.e., Wickes Law contracts. CPM on these projects will help avoid time-related disputes and potential delay disputes.
- C. Projects of Regional significance, as determined by the Regional Director, such as projects critical to local safety, traffic, or program needs, i.e., projects with long, off-site detours or extended lane closures. These projects may get a lot of attention and would warrant additional effort to ensure timely completion.
- D. Projects estimated to cost more than \$20 million. Large projects such as a major interchange construction or reconstruction projects with several bridges, multiple construction phases, numerous subcontractors, etc., should be scheduled using CPM due to their size and complexity.

Implementation

The project designer shall determine if a project meets the criteria for the CPM schedule item. The project designer shall contact the Regional Construction Engineer (RCE) to verify the appropriateness of including the CPM schedule item. If the item will be included the project designer will indicate it in the Advance Detail Plan (ADP) transmittal letter. The RCE with appropriate justification may choose not to include the CPM schedule item. The RCE may direct that the CPM item be included due to unique project conditions such as:

- The RCE may request that the contract pay item for CPM be used on a contract that does not meet criteria A, B, C, or D if the use of a CPM schedule will assist the EIC during construction.
- The RCE may request that the CPM schedule be required for only part of a project. For example a short- duration I/D phase. For these situations appropriate special notes shall be developed and Item 637.3551--20 be included in the plans. The estimated cost of this item shall be adjusted in proportion to the value of the work in the schedule period using the cost estimating equation herein.

For projects that meet selection criteria, the Designer shall include Item 637.3551--20 M - CPM Scheduling in the Engineer's Estimate. The CPM contract pay item specification will be provided by the Designer with the PS&E submittal.

Cost Estimating

For cost estimation purposes use the following equation:

$$\text{Estimated CPM Scheduling Cost} = \$10,000 + [(0.0005) \times (\text{Total Engineer's Estimate})]$$

(Note: Round the amount to the nearest \$1,000)

BACKGROUND:

Standard Specification §108-01, *Start and Progress of Work*, contains the contract provisions for planning, scheduling, and monitoring the work. The standard scheduling provision leaves the choice of scheduling technique up to the Contractor. The Contractor can meet the requirements by submitting a bar chart, a CPM network diagram, or other suitable graphical representation of the proposed work plan. For projects with few activities or activities that can proceed without much interaction, bar charts are normally used and are an acceptable method of communicating the proposed work plan. The disadvantage of bar charts is their inability to depict the interrelationships between activities or identify activities that are critical to project completion. For projects that have many activities that must continuously interact, a CPM network diagram is more appropriate and should be used.

For a more detailed overview of CPM scheduling techniques, refer to any of the numerous publications on CPM scheduling and construction management. *Construction Planning & Scheduling*, publication #3500.10, published by the Associated General Contractors of America (AGC) is a good source of information on this topic. Copies may be purchased from AGC.

CONTACT:

Direct questions regarding this Engineering Instruction to Larry Palaski of the Construction Division at Phone: (518) 457-6472, Email: mo-construction@dot.state.ny.us. Include the EI number and title along with the contact person's name in the phone message/email when making inquiries regarding this EI.