

Mitigating Projects Missing Deadlines

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FINAL REPORT

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Chapter 1: Introduction

This research paper was commissioned to produce an educational guide for agencies on contract language and processes that, when used, will improve the likelihood of a project being delivered on time. The guide was supported by the following:

- Review of current industry standards and literature related to contract time determination, contract type, and contract disputes and claims
- Investigation of current contract language producing successful contract completion
- Investigation of ways to mitigate potential project delays during the construction and design phase of a project
- Understanding the use of liquidated damages, when they are used, and the frequency of collecting or negotiating them away

1.1 Organization of Report

This report is organized into the following sections:

- A summary of the research of existing practices of various agencies related to estimating contract time
- A summary of current contract language producing successful contract completion
- A summary of the use of liquidated damages as well as when they are used and the frequency of collecting or negotiating them away

Chapter 2: Review of Current Industry Standards

2.1 Minnesota Department of Transportation (MnDOT)

Contact(s): *Kevin Kosobud (MnDOT Project Development Engineer & Former Resident Engineer), Online Specifications*

Website: <https://www.dot.state.mn.us/pre-letting/spec/>

Research Document(s): 2020 Standard Specifications for Construction

2.1.1 MnDOT Prime Contractor Rating

During the mid-2000's MnDOT implemented a statewide contractor rating system for all state highway projects. The goal of this rating system was to create a historical database of ratings based on project performance and eventually correlate the contractor ratings to the bidding process in hope of getting the best prime contractor for each project.

A rating scale from one to five was developed (one being poor and 5 being excellent) that rated the performance of each prime contractor. At the end of each project, the Resident Engineer, Project Engineer and Chief Inspector individually rated the performance of each contractor throughout the project. Ratings were given for contractor communication/coordination, mitigation of project issues and overall project performance. These three individual rating scores were then combined and submitted as one rating. The problem with the rating system that was developed was that one individual could skew the ratings and there was no consistency in the ratings at a District and even State level.

When the Contractor Ratings were implemented, contractors were not onboard and felt the scores were subjective and being rated on things out of their control during a project, for example, a poor deigned set of plans with errors.

MnDOT's implementation of contractor rating only lasted 2 years. In 2007, the legislature allowed the use of Best Value selection for highway construction project and is primarily used today on Design-Build (DB) and Construction Manager General Contractor (CMGC) alternative delivery projects. Some pitfalls to the program included maintaining the rating database, and there was no consistency of the ratings across the state.

2.1.2 MnDOT Standard Specifications for Construction

The 2020 MnDOT Standard Specifications for Construction were reviewed for applicable industry standard contract language related to the Contract Award process, Determination and Extension of Contract Time and Contract Administration. The MnDOT Standard Specifications for Construction are updated every couple of years to improve Contract language from lessons learned and best practices during the administration of construction projects.

(1103) – Definitions –

- **Award** — *The Department’s selection of a Bidder’s Proposal, subject to execution and approval of the Contract.*
- **Bar Chart Schedule** – *A schedule format which includes an activity information table and Bar Chart.*
- **Baseline Schedule** – *A schedule which represents the Contractor’s planned timing and sequencing to accomplish the entire Project scope of Work within the Contract Time. Once accepted by the Department, the Baseline Schedule becomes the Progress Schedule.*
- **Bidder** — *An individual, firm, or corporation submitting a Proposal for the advertised Work.*
- **Completion Date** – *The date by which the Work is specified to be completed.*
- **Contract** — *The written agreement between the Department and the Contractor setting forth their obligations, including, but not limited to, the performance of the Work, the furnishing of labor and Materials, the basis of payment, and other requirements contained in the Contract.*
- **Contract Time** – *The Completion Date, number of Working Days, or number of Calendar Days allowed for completion of the Contract and any intermediate Milestones, including authorized extensions in accordance with 1806, “Determination and Extension of Contract Time.”*
- **Contractor** – *The individual, firm, or corporation contracting for and undertaking prosecution of the prescribed Work; the party of the second part to the Contract, acting directly or through a duly authorized representative.*
- **Controlling Activity** — *The first incomplete Activity(ies) with the earliest start date that resides on a Critical Path. A Controlling Activity may also be referred to as a driving Activity.*
- **Department** — *The State Department of Transportation, or the political subdivision, governmental body, board, commission, office, department, division, or agency constituted for administration of the Contract within its jurisdiction.*
- **Incentive** — *An amount, up to a maximum, that the Contractor can earn by meeting the requirements in the specification establishing the incentive.*
- **Look-ahead Schedule** — *A schedule that spans at least 7 Calendar Days of actual progress and at least 14 Calendar Days of planned Work on a rolling basis.*
- **Monetary Deduction** — *An equitable adjustment made pursuant to 1512.1, “Unacceptable Work,” when the Contractor’s Work or Materials do not meet standards specified in the Contract, or do not meet generally accepted industry standards if the Contract does not provide specific standards.*
- **Progress Schedule** — *The schedule submitted by the Contractor and accepted by the Department for managing the Project. For example, the Baseline Schedule is the Progress Schedule from the Data*

Date of the Baseline Schedule to the Data Date of the first Update Schedule. The first Update Schedule is the Progress Schedule from its Data Date to the Data Date of the next accepted Update Schedule

(1201) – Prequalification of Bidders – *The Department will not require the prequalification of the Bidders before submission of Proposals, but the Department may require a written statement from the apparent low Bidder before Award. If the Department requires a written statement, the statement shall include the following: Bidder experience, Bidder certifications, Bidder licenses, The amount of capital and Equipment available for performance of the proposed Work.*

(1302) – Award of Contract – *“Within 33 Calendar Days after opening Proposals, the Department will Award the Contract to the lowest responsible Bidder provided that the lowest responsible Bidder complies with the Proposal Requirements.... The Department and the lowest responsible Bidder may mutually agree to extend the time within which the Department makes the Award.*

(1306) – Execution and Approval of Contract – *“The lowest responsible Bidder shall return the Contract to the Department with the required Payment and Performance Bonds within 7 Calendar Days after Award.”*

“If the Contract specifies the Contract Time as Working Days and the lowest responsible Bidder fails to return the signed Contract documents within 7 Calendar Days, the Department may reduce the Contract Time to reflect the delay caused by the Contractor.”

“The Department will provide the lowest responsible Bidder with a notice of approval or disapproval of the Contract and Contract Bonds within 14 Calendar Days after the lowest responsible Bidder properly signs and returns the Contract documents to the Department.”

(1506) – Supervision by Contractor – *“The Contractor is responsible for the following... 2. Assuming full responsibility for supervising the Work irrespective of the quantity of Work subcontracted. 3. Facilitating the Work progress and ensuring Project completion as required by the Contract.”*

(1506.2) – Competent Individual – *“For the duration of the Contract, the Contractor shall provide a competent individual on the Project during the Work who is: (1) Authorized and capable to manage, direct and coordinate the Work in progress.”*

(1517) – Claims for Compensation Adjustment – *The Contractor shall not file a claim unless the Contractor has exhausted the requirements of 1402, “Contract Revisions,” and 1403, “Notification for Contract Revisions” including the notice requirements in 1403, “Notification for Contract Revisions.” Failure to comply with the notice requirements of 1403, “Notification for Contract Revisions,” is deemed to be a waiver of the claim. The Contractor is not entitled to compensation or time extensions for disputed Work under this section (1517) unless the compensation or time extension is required or provided for elsewhere in the Contract.”*

(1801) – Subletting of Contract – *“The Contractor must not sublet, sell, transfer, delegate, or assign the Contract or any portion of the Contract without the Engineer’s consent. The Contractor may, with the*

Engineer’s consent, sublet a portion of the Contract if the Contractor self-performs Work amounting to at least 40 percent of the total original Contract amount.

“On Contracts with Disadvantaged Business Enterprise (DBE), Targeted Group Business (TGB) or Veteran-Owned Small Business (VET) established goals, or any combination thereof, the Contractor’s organization shall perform Work amounting to not less than 30 percent of the total original Contract amount.”

(1806.1) – Determination and Extension of Contract Time – “The Proposal Package will specify the Contract Time. The Contractor shall prosecute the Work continuously and effectively, with the least possible delay, to the end that all Work is completed within the Contract Time.”

(1806.2) – Types of Delays – “C. Non-Excusable Delays – Non-excusable delays are delays that are the Contractor’s fault or responsibility. All non-excusable delays are non-compensable. Non-excusable delays include but are not limited to: (3) Delays due to the Contractor’s failure to provide sufficient forces and Equipment to maintain satisfactory progress in completing the Controlling Activities.”

(1807) – Failure to Complete the Work on Time – “The Department is entitled to damages for failure of the Contractor to complete the Work within the Contract Time. In view of the difficulty in making a precise determination of actual damages incurred, the Department will assess a daily charge not as a penalty but as liquidated damages to compensate the Department for the additional costs incurred.”

(1807.1) – Assessment of Liquidated Damages – “The Department will deduct liquidated damages from money due to the Contractor for each Calendar Day that the Work remains incomplete after the Contract Time expires. The Engineer will deduct liquidated damages based on the original Contract amount and Table 1807.1-1.”

**Table 1807.1-1
Schedule of Liquidated Damages**

Original Contract Amount		Liquidated damage charge per Calendar Day, \$
From more than, \$	To and including, \$	
0	25,000	300
25,000	100,000	400
100,000	500,000	900
500,000	1,000,000	1,200
1,000,000	2,000,000	1,500
2,000,000	5,000,000	2,500
5,000,000	10,000,000	3,000
10,000,000	—	3,500

Figure 2.1: Schedule of Liquidated Damages

(1807.2) – Waiver of Liquidated Damages – “The Department may waive all or any portion of liquidated damages after the date the Work is substantially completed if the Engineer determines that the Work is in a condition that no longer requires ongoing inspection by the Department. The Department will not deduct liquidated damages during periods of authorized suspension.”

2.1.3 Document Takeaways

1. Timely communication and contract administration set the tone for the project following letting. MnDOT Specification 1302 outlines a 33-day turnaround from bid opening to Award (if the Bidder complies with proposal requirements).
2. MnDOT Specification 1201 (Prequalification of Bidders) — does not require prequalification of Bidders to pursue Work, but MnDOT *may* require a written statement from the Apparent Low Bidder that includes experience, certifications, licenses and equipment available for the Work. However, it does not state specifically that the department may reject all bids based on the written statement it receives. This might be an opportunity to add language.
3. MnDOT Specification 1806.1 – Determination and Extension of Contract Time outlines completion dates and assumptions made during the development of Contract Time (5-day vs 6-day workweeks)
4. MnDOT Specification 1806.2 – Types of Delays – defines the four types of delays and whether the delay is compensable and excusable.
5. MnDOT Specification 1807.1 – Assessment of Liquidated Damages – defines when Liquidated Damages may be deducted from the original contract amount.
6. Proper use of the correct contract language that is applicable to your project is more important than just adopting standard language.

2.2 Texas Department of Transportation (TxDOT)

Contact(s): *Online*

Website: <http://www.txdot.gov>

Research Document(s): Internal TxDOT Crossroads Site Manager Database, 2014 Standard Specifications for Construction and Maintenance of Highways

2.2.1 Contractor Prequalification

The Texas Department of Transportation (TxDOT) must qualify prime bidders to become eligible to bid or to receive a bid proposal on a construction or maintenance project. process is broken down into three levels of qualification, all of which require annual requalification. The three levels of questionnaires include:

- **Confidential Questionnaire (CQ)** – this level of qualification is normally for construction projects. Bidders must provide an audited financial statement prepared by an independent certified public accountant. Financial statements must be less than one year old and must be approved for at least one letting prior to the anniversary date.
- **Bidder's Questionnaire (BQ)** – This level of qualification is for bidding on projects for which the full requirements outlined above are waived – normally smaller construction, routine maintenance,

emergency, and specialty projects. To satisfy the requirements for bidding on a waived project, bidders must provide a completed bidder’s questionnaire and related supporting documents.

- **Material Supplier’s Questionnaire** – This level of qualification is for suppliers bidding on material and traffic control safety device projects, which is limited to the purchase and delivery of materials used on roadways for in house state force work only. To satisfy the requirements for bidding on a materials project, bidders must provide a completed Materials Supplier Questionnaire and related supporting documents. Any contractor with an approved confidential questionnaire or bidder’s questionnaire may bid on material related projects.

Table 2.1: TxDOT contractor prequalification

Questionnaire	Financial Statement Needed	Project Types	Bidding Capacity
Materials Questionnaire	None	Materials Contracts	N/A
Bidder’s Questionnaire	No Financial Statement is required, but a compiled or reviewed statement can be submitted to increase bidding capacity to over \$300,000.	Waived Projects Materials Contracts	Contractors will be limited to \$300,000 unless a compiled or reviewed financial statement is submitted. The method of calculating bidding capacity with a financial statement can be found on the questionnaire.
Confidential Questionnaire	An audited financial statement is required	All highway construction, maintenance, and materials projects	The calculation method for bid capacity is net working capital from the financial statement multiplied by a factor determined by TxDOT.

Qualification of Bidders

TxDOT determines each Contractor’s bidding capacity – the maximum dollar value a Contractor may have under Contract with TxDOT at any given time. A Contractor may request and receive bidding proposals for upcoming projects for which the Engineer’s Estimate does not exceed bidding capacity, less any other TxDOT work currently under Contract. TxDOT grants a 90-day grace period for the preparation of a new qualification statement. All qualification statements must be received by at least 10 days prior to the project letting date.

TxDOT maintains a database of prequalified Contractors for each of the three categories: Materials, Bidding and Confidential Questionnaire. Only prime contractors are required to be prequalified with TxDOT. Subcontractors do not need to be prequalified with TxDOT. Subcontractors do need to be registered with the Texas Secretary of State and be registered in the Department of Homeland Security's E-Verify Program.

2.2.2 AASHTOWARE SiteManager

In 2001, TxDOT formed the Construction and Materials Information System Development (CMISD) section to facilitate the Department's implementation of AASHTOWARE's construction software SiteManger. SiteManager is an AASHTOWARE product that automates and streamlines the management of highway construction projects including enhanced workflow management that drives accountability and creates the proper documentation. This program has been used by TxDOT since the early 2000's. the CMISD group participates in work groups with other state agencies to collaboratively identify improvement areas and currently has over 6,400 users on TxDOT projects. Any TxDOT employee or consultant who is actively working on a TxDOT project has access to this database and can run reports at a District or Project level that summarize all components of contract administration. The main search parameter for each of these categories is the TxDOT project number (CSJ). The reports available in this database and are broken into the following categories.

- Change Orders
- Contract Administration
- Contractor Payments
- Daily Work Reports
- Materials Management
- References
- Security Administration
- Vendor-Subcontractor

AASHTOWARE SiteManager has the following main functions:

- **Contract Administration** — monitors the contractors progress schedule, receives payrolls, monitors, and reports on status, and provides reference data for vendors, subcontractors and bid items.
- **Contract Records** — Contract records allow recording of various project data such as permits, correspondence, contractor evaluations, disputes and claims, conference meetings, stockpiled materials, key dates, checklists, funding, design evaluations, and change order (includes extra work orders, time extensions, over/underruns, etc.) creation, tracking and approval.
- **Daily Work Reports** — Daily work reports allow inspectors to capture work performed at the job site, such as personnel, equipment, work items, quantities, descriptions, and force account information such as labor, equipment, and materials. Information is downloaded to the inspector's

laptop to provide reference data to the inspector along with sophisticated data editing by the software. The captured information is then uploaded to the project manager for review and approval.

- **Contractor Payments** — Contractor payments generate estimates, processes contract and line-item adjustments (includes liquidated damages, fuel adjustments, price adjustments, and licensee-specific adjustments), and manages retainage. It provides tracking, approval, finalization, and discrepancy notification/resolution for items such as certified payrolls and tested materials.
- **Materials Management** — Materials management provides recording, tracking, and reporting of material samples and test results from job sites, plants, and test labs. Comprehensive lists are included for reference and validation of data, including materials, lab qualifications, testing personnel, approved material lists, producer/suppliers, calibrated equipment, welders, and inspectors. Aggregate, concrete, and bituminous concrete mix designs are supported. Additional features include sampling and testing requirements for contracts and reporting of the status of tested materials for a contract.

2.2.3 Document Takeaways

1. Contractors bidding on TxDOT construction projects must be prequalified on an annual basis. Subcontractors are not required to be prequalified.
2. TxDOT determines each contractor's maximum dollar value a contractor may have under contract at any given time and this factors into bidding opportunities for the prime contractor.
3. The prequalification process does not take into consideration previously completed projects that were delivered late. Prequalification is only based on financial statements and resources.
4. Various Reports available through Site Manager are useful tools to gauge progress Contractors are making on other TxDOT projects.

2.3 Florida Department of Transportation (FDOT)

Contact(s): *Online*

Website: <https://www.fdot.gov/construction/cppr/CPPRGuidelinesMain.shtm>

Research Document(s):

- https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/construction/cppr/cppr.pdf?sfvrsn=261d6a61_2
- https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/content/construction/cppr/cppr-presentation/1j_contractor-past-performance-rating-cppr-2018--updated.pptx?sfvrsn=314b16f3_0

2.3.1 FDOT Contractor Past Performance Rating

In addition to Contract language related to the award process and administration of construction projects, the Florida Department of Transportation (FDOT) utilizes a Contractor Past Performance Rating (CPPR). This mandatory rating system was implemented in 2018 and the Contractor's past performance score is used to determine bidding capacity. The CPPR system was implemented to communicate performance issues proactively and create competition between Contractors to improve project performance. The CPPR was derived from Rule 14-22 Florida Administrative Code and considers nine factors of project progress including but not limited to pursuit of the work, deficiency letters (Conformance of Contract documents) timely completion of Work and submittal documents and mitigation costs and time overruns. The percentage rating score from each of the nine sections is averaged and the average score is then assigned an Ability Factor.

The maximum capacity Rating (MCR) = $AF * CRF * ANW$

MCR = Maximum Capacity Rating

AF = Ability Factor (Ranges from 1 to 15)

CRF = Current Ratio Factor (Ratio of adjusted current assets and adjusted current liabilities)

ANW = Adjusted Net Worth

The higher the average score, the higher the bidding capacity. The MCR then impacts pre-qualifications and bidding capacity on FDOT projects.

The following sections of the CPPR rating related to Contractor's overcommitting and missing deadlines are summarized below.

Section 1 – Pursuit of the Work. This section scores Contractors on their ability to pursue work diligently and systematically with sufficient labor, materials, and equipment always with active progress made on the Critical Path items each day in accordance with the schedule. This includes the scheduling and management of subcontractors on the project. There is a maximum score of 12. An example is shown in the figure below:

CATEGORY 1 - Pursuit of the Work	Score (max. of 12):	5.0
	Pursuit of Work	66%

Period	Work Days	Pursued Days	Remarks
Jan 2001	12	12	
Feb 2001	20	16	
Mar 2001	17	17	Rained 3/4, 3/7, and 3/15
Apr 2001	20	20	
May 2001	20	0	contractor in LD's, counted work days
Jun 2001	10	0	after allowable time ran out

Figure 2.2: Category 1 Rating Example

Section 1 is based on allowable contract time (minus weather days) and on a five (5) day workweek unless stated in the contract. The Contractor’s performance is measured against the submitted, accepted schedule. If a Contractor is not working on the Critical Path activities on the project, then his performance is measured as a non-pursuit day.

Section 3 – Timely & Complete Submittal of Documents. This section scores Contractors on project performance related timely and accuracy of project documents including but not limited to project schedules, time extension requests, responses to correspondence, material certifications, shop drawings work plans and weekly Maintenance of Traffic/NPDES reviews.

Section 4 – Timely Completion of Project. This section rates Contractor’s ability to complete the project in a timely manner, including interim milestones and substantial completion milestones. The agency tracks weather days each month and notifies Contractor in the monthly weather letter. Contractors can appeal the grade given in this category for the month within 10 days of receiving the weather letter. The maximum score for Section 4 is 14 points.

Section 6 – Mitigate Cost & Time Overruns. This section rates the Contractor on taking the initiative to avoid cost or time increase and mitigate the effects of changes conditions when they occur. If there are requests for additional compensation and time, they are well documented (complete and accurate), fair and are submitted in a timely manner.

2.3.2 Document Takeaways

1. Communication between the Contractor and Agency is a key element for the CPPR to work effectively.
2. There was no defined rating scale mentioned in the documents reviewed to determine contractor ratings and how exactly the rating score affected the contractor’s prices during the bidding period.
3. When issues arise on projects, the Contractor must proactively deal with said issues, so their CPPR score is not affected.
4. Proper documentation is necessary to effectively support the CPPR process and acts as an audit for the agency when preparing the “finals” for each project.

5. All project ratings provided to the Contractor by the Agency can go through an Appeals Process if the notice is filed promptly.

2.4 Minnesota Department of Transportation (MnDOT) Contract Administration Manual

Contact: Document(s) obtained from website

Website: <https://www.dot.state.mn.us/const/tools/conadmin.html>

Research Document(s): Minnesota Department of Transportation Contract Administration Manual 2020 Edition.

2.4.1 MnDOT Contract Administration Manual

The Minnesota Department of Transportation annually publishes a Contract Administration Manual that includes best practices for contract administration. This manual is free to download and can be used by individuals administering a construction project. A good portion of MnDOT's Contract Administration Manual is related to progress schedules and how to thoroughly review schedules throughout a construction project.

Progress Schedules

The Department specifies Contract Time in which the project is to be built. The Standard Specifications require that the Contractor submit a Construction Progress Schedule giving a satisfactory schedule of operations that provides for completion of the work within the allotted Contract Time. This chapter is not meant to replace or repeat the 1803 Standard Specification or Special Provisions.

A Critical Path Method (CPM) schedule is acceptable on all projects; a bar chart schedule is only acceptable on projects that do not require a CPM schedule. CPM requirements will be outlined in the Project Special Provisions. The schedule's purpose is to help the Contractor and the Engineer plan, coordinate, document, and control the project's progress. The schedule should:

- Establishes completion dates.
- Is used to analyze the impacts to the Contractor's schedule if work is added to the project.
- Is used to analyze claims for time and money.
- Provides information to the Project Engineer that can be used to inform the public of traffic impacts.
- Must be comprehensive and realistic.

The progress schedule is the responsibility of the Contractor. If the schedule does not make sense or is illogical, the Engineer must ask for clarifications. A revision of the details in question is required prior to acceptance.

Reviewing and Accepting the Contractor's Schedule

- Is the project identified?
- Does the schedule and its attachments meet the detailed requirement of the specification?
- Does the schedule graphically depict the Work?
- Is there sufficient detail to truly describe the Work?
- Are the sequences and activity durations reasonable?
- Are critical deliveries shown?
- Is there consideration for winter months?
- Are special MnDOT requirements from plan notes or special provisions accounted for?
- Does the schedule fit within the duration allowed by the Contract?
- Are there clear relationships shown between activities?
- Does the schedule conflict with any requirements of the Contract?

The progress schedule is the main tool with which the owner can monitor the progress of the contract and determine at an instant the status of the Work. It is therefore especially important that the Project Engineer accurately review the schedule before acceptance. Monitoring the progress schedule is particularly important in determining "fault" or responsibility for project delays. Standard Specifications 1806 allows the Engineer to grant requests for an extension of time if the work was delayed.

Schedule

There are several tools for monitoring the status of a project. The main tool is the progress schedule. The progress schedule should be reviewed at regular intervals with the Contractor at the project level by the Engineer and at the following times:

- The start of the project to detect if the Contractor began as scheduled.
- Every two weeks on larger, more complex projects; monthly on smaller, less complex projects.
- Following the completion of a major item of work.
- Following the completion of a phase or sub phase of work.

- Before, during, and after any type of delay to determine whether the delay was owner caused, Contractor caused, or concurrent.

Results of this review should be included in the daily diary. The diary entry should list the reasons the Contractor cannot proceed with certain portions of the Work. Accuracy and details in the daily diary concerning delays will protect the Department against successful prosecution of many claims.

Progress Meetings

Effective progress meetings are very productive for enhancing communications, discussing issues, solving problems, and thus furthering the progress on the Project. The Engineer must invite the appropriate personnel to attend the progress meetings. The status of the project must be discussed with the Contractor. This time would be ideal to determine if the schedule must be updated.

Schedule Review

The progress schedule must include all activities necessary to physically complete the project. Activities consume time and usually consume resources. Activities like concrete curing time and slope staking earthwork may be rolled-up into the overall duration of the activity.

The progress schedule must show the planned order of work in logical sequence, and in compliance with any requirements of the contract. The reviewer should remember that some work is sequenced by factors inherent in it, but the Contractor may sequence the work by preference if the project is completed within the authorized time and in conformance with the contract.

The progress schedule must show activities in durations that are reasonable for the intended work. Since durations of work are a function of resource allocation, the Project Engineer may be required to estimate production rates using estimating manuals, experience, or other resources, or to ask the Contractor to explain their planned resource allocation to support the duration.

The progress schedule must define activities in sufficient detail that they may be evaluated daily. The reviewer should keep in mind that the level of detail required in a progress schedule is driven by the amount of precision required to perform and monitor the work. For example, a single activity that represents several miles of grading may not provide adequate detail and may need to be subdivided into smaller activities described by station limits.

The progress schedule must show the physical completion of all contract work within the authorized contract time.

Contract Time

The Proposal Package will specify the Contract Time. In accordance with 1806.1, the Contractor shall prosecute the Work continuously and effectively, with the least possible delay, to the end that all Work is completed within the Contract Time.

Working Day Charges

Assess working days in accordance with 1806.3 "Determination of Charges on Working Day Contracts." Document, each day, decisions to assess Working Days. Charge time in accordance with the Contract on a day-by-day basis with no prejudice. No prejudice means the Engineer cannot give the Contractor a break because of his bad luck or bad planning or for any other reasons. No prejudice also means the Engineer cannot use time charges punitively to harm a Contractor perceived as noncooperative or for any other reason. Contract time should be charged based on schedule and project conditions.

Assess working days in an equitable manner based on the information available at the time of charges. This information determines the Contract Time and is used to assess liquidated damages if the Contractor does not complete the required work within the allotted time on a working day contract.

The Special Provisions and addenda frequently alter the provisions of the specifications, e.g., working day may be defined as a 10-hour day, 6 days per week; carefully review the applicable special provisions prior to making any working day charges.

Weekly Report of Time Charges

On Contracts using Working Days, submit the Weekly Report of Time Charges to the Contractor, except:

- a) During authorized suspensions of Work; or
- b) During ordered suspensions of Work provided the ordered suspension is for reasons beyond the control of the Contractor; or
- c) When Liquidated Damages have been waived, in accordance with 1807.2, and all work except vegetation maintenance has been completed; or
- d) When the Contract provides that all Work, except maintenance and final cleanup be completed by the completion date.

Contractor Objections to Working Day Assessment

In accordance with 1806.3, the Contractor may object to an improper or excessive assessment of working day charges in a written protest to the Engineer, within 10 calendar days of receipt of statement, setting forth the specific dates and justifications for reduced charges. If the Engineer finds the Contractor's protest to be valid or if the Department detects an error, the Engineer will issue corrected weekly statements. Once accepted by the Contractor, whether explicitly or because of the Contractor's failure to file a timely protest, the Weekly Report of Time Charges is final, and the Contractor waives entitlement to an extension of Contract Time or 20% compensation for any delays not explicitly identified by the weekly statement.

Contract Time Extensions

MnDOT Specification 1806.1 allows for Contract Time extensions under certain conditions. Extend the Contract Time only if an excusable delay, as specified in 1806.2.A or 1806.2.B, delays Work on the Critical Path.

The Department will not evaluate a request for extension of the Contract Time unless the Contractor notifies the Engineer as specified in 1403 and provides the required analysis in accordance with 1806.1 regardless of the type of schedule the Contract requires.

The Department will not grant an extension of the Contract Time for delays incurred between November 15 and April 15, inclusive, unless the Contractor's Progress Schedule in place at the time the delay occurred indicated that the Contractor intended to perform Critical Path Work from November 15 through April 15.

The Department may order the Contractor to continue Work between November 15 and April 15, inclusive, and compensate the Contractor for costs incurred due to cold weather Work. See 1806.4, and your special provisions for info for time extensions due to weather for completion date contracts and any additional weather charts. Changes to the Contract start date, completion date, or number of working days allowed for the Contract, require a Change Order Level 2.

Completion Date Contracts

While it is not necessary to assess working days on completion date contracts, or to provide the Contractor with a Weekly Report of Time Charges, it is necessary to document the Contractor's operations, weather, and delays in the Daily Diary.

Liquidated Damages (LDs)

The Department is entitled to damages for the failure of the Contractor to complete the Work within the Contract Time. The Department will assess a daily charge, not as a penalty, but as LDs to compensate the Department for the additional costs incurred. Assess LDs in accordance with 1807.1.

Only waive the LDs in accordance with 1807.2. Review contract special provisions, they may have specific LD (Liquidated Damages) waiver requirements. LDs may be reduced in certain circumstances.

Monetary Deductions

Assess monetary deductions for failure to meet intermediate completion time requirements separately from LDs. Appropriate Contract Time set up within AASHTOWare Project™ will accomplish this.

2.4.2 Document Takeaways

1. The progress schedule is the main tool with which the owner can monitor the progress of the contract and determine at an instant the status of the Work. It is therefore especially important that the Project Engineer accurately review the schedule before acceptance.
2. The schedule must include all activities necessary to physically complete the project.
3. Contract time extensions only extend the contract time if the delay is excusable as defined in MnDOT specification 1806.2 and the delay is on the Critical Path.
4. The Department is entitled to liquidated damages for the failure of the Contractor to complete the Work within the contract time.

2.5 Federal Highway Administration (FHWA)

Contact: Document(s) obtained from website

Website: <https://www.fhwa.dot.gov/construction/contracts/>

Research Document(s): FHWA (FEDERAL HIGHWAY ADMINISTRATION) Guide for Construction Contract Time Determination Procedures. Incentives/Disincentives (I/D) for Early Completion.

2.5.1 Contract Time Determination

The Federal Highway Administration (FHWA) has a Technical Advisory publication, TA 5080.15, dated 10/15/02 that establishes procedures for accurately determining construction contract time determination. Contract Time is defined as the maximum time allowed in the contract for completion of all work contained in the contract documents. Contract time is under the most scrutiny when a project is taking longer than anticipated, or when a contractor does not appear to be aggressively pursuing the work. Whatever the case may be, the causes are traceable to overestimating contract time by an agency or poor contract management and scheduling of the construction operations.

Improper contract time estimates can lead to increased project costs, including labor and equipment and contractors not meeting completion dates. The proper selection of contract time allows for optimization of construction costs and resources. Essential elements in determining contract time include, establishing production rates for activities on the critical path, applying the correct production rates to each project, understanding material fabrication durations and development of a contract time progress schedule.

A production rate is the quantity produced or constructed over a specified period. When developing a contract time schedule, establishing realistic production rates should be based on project size, location and rural or urban setting. An Agency's production rate ranges should be established in the written procedures based on project type, size, and location of Critical Path work.

Develop Logic – Proper schedule logic needs to be assigned to activities in the time determination schedule to simulate the contractor’s operation during construction. Assign predecessor and successor logic between activities in the schedule. The most used relationship types are Finish to Start (FS) and Start to Start (SS). When developing the time determination schedule, the activity relationships need to be reviewed to validate that concurrent work between similar construction crews is not occurring unless planned. Concurrent work increases the number of resources needed to deliver a project and has cost implications.

Finish to Start (FS) - The FS activity relationship means the successor activity cannot start until the predecessor finishes. The figure below shows an example of a FS relationship. Activity B cannot start until Activity A is finished.

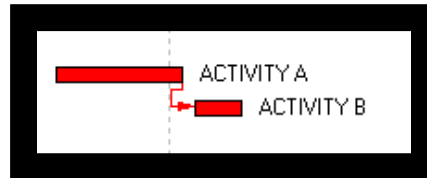


Figure 2.5: Finish to Start Relationship (FS)

Start to Start (SS) - The SS activity relationship means the successor activity cannot start until the predecessor starts. The figure below shows an example of a SS relationship/ Activity B cannot start until Activity A starts.



Figure 2.6: Start to Start Relationship (SS)

Establish Working Periods – Working periods need to be properly defined during the development of the contract time schedule. Working periods include seasonal limitations for certain work items and anticipated days lost due to weather. CPM schedule specifications often define anticipated days lost during due to weather monthly. These lost days need to be incorporated into the time determination to accurately simulate anticipated conditions.

Established Durations – Durations for activities should be calculated by taking a specific quantity for a given item and dividing by the anticipated production rate for that activity. Before time durations for individual work items can be computed, certain project specific information should be determined, and some management decisions made. The relative urgency for the completion of a proposed project should be determined. The traffic volumes affected as well as the effect of detours should be analyzed. The size and location of the project should be reviewed, in addition to the effects of staging, working double shifts, nighttime operations, and restrictions on closing lanes. The availability of material for controlling items of work should be investigated.

2.5.3 Incentives/Disincentives (I/D) For Early Completion

A review of the FHWA Technical Advisory (T 5080.10) – *Incentive/Disincentive (I/D) for Early Completion*, dated February 8, 1989, provides guidance for agencies related to the administration of incentive/disincentive provisions for early completion on highway construction projects or interim completion dates. Incentives/Disincentives for early completion is defined as a contract provision that compensates the contractor for a certain amount of money for each day the work is completed ahead of schedule and assesses a deduction for each day the contractor overruns the allotted amount of time. These types of provisions are intended for projects where traffic inconvenience and delays are to be held to a minimum. The I/D amounts are based upon estimates such as road user delay costs, traffic safety and traffic maintenance. The I/D time is determined by the department during the design phase of the project and is finalized prior to advertisement for bids. This time begins when traffic is impacted by the project and normally ends when unrestricted traffic is permitted.

The current FHWA policy allows for approval of I/D provisions for early completion of highway projects if the early completion of critical improvements result in a significant costs savings and/or positive benefits to the traveling public.

I/D Project Selection

Early completion incentives can be an effective method to motivate a contractor to complete a project or portion of a project faster than normal. I'D provisions are not recommended for repeated use on all project and should be limited to projects where construction severely impacts routine highway traffic and significantly increases road user costs. For the I/D provisions to be successfully implemented, project selection during the early stages of project development is crucial. Projects being considered for I/D provisions should be constructable in one construction season or less. The following characteristics have been associated with projects that are deemed appropriate for the I/D contract provisions:

1. High traffic volumes typically in urban settings.
2. Projects that will complete a gap in the highway system.
3. Major reconstruction or rehabilitation of existing infrastructure that will severely disrupt traffic.
4. Major bridge/structures construction.
5. Length of detours during construction.

Properly determining the accurate amount of I/D time is one of the major problems when developing a I/D project. Properly developing a duration for an I/D project must consider the feasibility and associated cost of compressing a construction schedule. If contractors bidding on these types of projects feel the completion dates are unrealistic and impossible to meet, they may not even pursue the work. The proper way to determine a duration for a I/D project is to compute contract time utilizing a CPM schedule.

The use of CPM schedules during the development of I/D projects is based on breaking down the project into separate operations necessary to complete the work. These separate operations can then determine a completion time for the project. Additional analysis can be performed to add incremental resources of manpower and equipment to validate the effects of accelerating the project.

2.5.4 Document Takeaways

1. Production Rates are not “one size fits all.” Production rates need to be determined based on project size, geographic location and rural or urban setting.
2. I/D provisions provide an effective method to motivate a contractor to complete projects or portions of a projects faster than normal.
3. I/D provisions are not recommended for routine use. I/D provisions needs to be used when traffic inconveniences and delays needs to be minimized.

Chapter 3: Current Contract Language and Successful Contract Completion

It's important to understand how the contract language as well as the quality of project documents influence timely completion. Even with the most clear and concise contract, contractors naturally must take risks, such as:

- Responsibility for the quality and responsiveness of subcontractors
- Availability and timely delivery of materials
- Subsurface materials, water, contaminants
- Public and private utility relocations
- Weather
- Material price volatility
- Availability and quality of the workforce
- Traffic
- Timely award
- Environmental impacts

To gather information and establish a baseline for this research, 50 local agencies (cities and counties) throughout Minnesota were surveyed and 50% of the surveyed agencies noted they need a better workflow that would enable them to estimate contract time more accurately. Of the agencies that responded to our survey, 34% of the respondents noted that between 20 and 40% of their construction projects finish later than planned, while 46% of the respondents say less than 20% of their construction projects are completed later than planned.

To gauge the size of the annual construction programs of the agencies surveyed, 54% of the agencies that responded to our survey have an annual construction program valued between \$2.5M and \$10M, while 28% of the respondents have a construction program valued between \$10M-\$40M.

3.1 Liquidated Damages

When it comes to assessing Liquidated Damages, 67% of the agencies who responded to our survey are not afraid to assess liquidated damages but it also mutually beneficial to maintain partnerships and avoid conflict and not assess Liquidated Damages for projects that are completed late. On the contrary, 25% of the agencies surveyed responded that they assess liquidated damages as the Contract allows. The MnDOT Contract Administration manual references MnDOT Standard Specification 1807.1, allowing the Contract Administrator to assess Liquidated Damages for failure to complete the work on time. Liquidated Damages are not deemed as a penalty, but as to compensate the Department for the additional costs incurred. Liquidated Damages should only be waived if the Engineer determines the Work is in a condition that no longer requires ongoing inspection.

The Standard MnDOT Specifications and Special Provisions on construction projects should be considered tools for contract administrators to use during the administration of their projects. An agency who chose to be unnamed wrote, *“Due to the size of our annual construction program, we see a full spectrum of issues with contractors not meeting completion dates. It’s been my experience that if an agency doesn’t enforce LD’s, your projects will be last on the priority list for contractors.”*

3.1.1 TH10 & Armstrong Blvd. Case Study

A 2017 court filing in the Minnesota Court of Appeals, *Lunda Construction vs. Anoka County*, ruled in favor of Anoka County for assessing liquidated damages for completion of a project beyond the contractual completion date. In March 2015, Anoka County publicly opened bids for a highway reconstruction project at the intersection of Highway 10 and Armstrong Blvd in Ramsey, MN. An essential component of the project was the closing and reopening of Armstrong Blvd. The contract documents identified specific work to be completed with 150 calendar days following the May 4, 2015, closure of Armstrong Blvd. The specific work needed to be completed and Armstrong Blvd reopened by October 30, 2015. During construction of the project, the Contractor encountered issues impacting the project’s timeline and submitted written notice of potential claim to Anoka County in September 2015. The county reviewed the documentation provided by the Contractor and responded stating there was no owner caused delay and in fact, the owner helped mitigate the contractor’s schedule a minimum of 18 days and that liquidated damages would be enforced as allowable by the contract documents. The contractor responded to the response provided by the county putting them on notice and intentions of filing a claim for compensation and time. In June 2016, within the required 60-day timeframe, the contractor submitted its claim to Anoka County for “direct damages (money and time due)” in connection with its work on the Armstrong Blvd interchange project. Anoka county immediately denied the claim in its entirety, finding both the claim lacked any merit and the contractor “failed to submit its claim in a timely fashion” thereby waiving its right to recover damages.

In January 2017, the contractor commenced a lawsuit against the county. In October 2017, both parties filed motions for summary judgment. The district court denied the contractor’s summary judgment and dismissed with prejudice the contractor’s claim. The court determined that the response provided by the County served as the “Engineer’s final written response,” thereby triggering the conditions of MnDOT Specification 1403.6 and Special Provisions S-20.2 (1517 – Claims for Compensation Adjustment).

MnDOT Specification 1403.6 – Contractor’s Recourse – *If the Contractor disagrees with the Engineer’s final written response or the Engineer’s response is untimely, the Contractor may pursue a claim in accordance with 1517, “Claims for Compensation Adjustment.” The Contractor shall give the Engineer written notice of the intent to pursue a claim within 5 business days of receiving the Engineer’s final written response.*

S-20.2 (1517 – Claims for Compensation Adjustment) – *The Contractor shall not file a claim until the Contractor has exhausted the requirements of 1402, “Contract Revisions,” and 1403, “Notification for Contract Revisions.” The Contractor is not entitled to compensation or time extensions for disputed work*

under this section (1517) unless the compensation or time extension is required or provided for elsewhere in the Contract.

The Contractor shall notify the Engineer in writing of any intent to file a claim for compensation or time extension. The Contractor shall not be entitled to compensation or a time extension if:

- 1. The Contractor fails to notify the Department.*
- 2. The Contractor's actions or inactions prevent the Department from keeping strict account of the impacts and costs of the disputed work.*
- 3. The Contractor's actions*

The court determined that because the contractor failed to satisfy the two conditions required for obtaining a time extension, it waived their ability to recover any damages.

3.2 Types of Delays

Like the survey that was developed for an Agency perspective, a similar survey was sent out to 50 regional contractors throughout Minnesota to get a contractor's perspective on some of the same common issues. Of the contractors that responded to our survey, nearly 70% of the contractors responded that >80% of their projects that are delivered late are considered an excusable delay per MnDOT Specification 1806.2. The contractors who responded were asked to rank the most impactful excusable delay from most impacted to least impacted. Utility conflicts/relocations were most impacted followed by material shortages and weather-related impacts. MnDOT Standard Specification 1806.2 – Types of Delays outlines the following types of delays.

3.2.1 Excusable, Non-Compensable Delays

Excusable, Non-Compensable delays are delays that are not the Contractor's or Department's fault or the responsibility, and that could not have been foreseen by the Contractor. The Department will compensate the Contractor for excusable, non-compensable delays.

Excusable, non-compensable delays include but are not limited to:

1. Delays to fires, floods, tornadoes, lightning strikes, earthquakes, epidemics, or other cataclysmic phenomena of nature.
2. Delays due to weather if the Contractor is entitled to a time extension for weather as specified in 1806.3, "Determination of Charges on Working Day Contracts," and 1806.4, "Extension of Contract Time Due to Weather on Calendar Day and Completion Date Contracts."
3. Extraordinary delays in material deliveries the Contractor or its suppliers cannot foresee or avoid resulting from freight embargoes, government acts, or regional material shortages.
4. Delays due to civil disturbances.
5. Delays due to acts of the public enemy.

6. Delays due to labor strikes that are beyond the Contractor's, subcontractor's, or supplier's power to settle and are not caused by improper acts or omissions of the Contractor, subcontractor, or supplier.
7. Delays due to acts of the government or a political subdivision other than the Department.
8. All other delays not the Contractor's or Department's fault or responsibility and which could not have been foreseen by the Contractor.

3.2.2 Excusable, Compensable Delays

Excusable, compensable delays are delays that are not the Contractor's fault or responsibility, and are the Department's fault or responsibility, or are determined by judicial proceeding to be the Department's sole responsibility.

Excusable, compensable, delays include, but are not limited to:

1. Delays due to revised Work as specified in 1402.2, "Differing Site Conditions," 1402.3, "Significant Changes to the Character of Work," and 1402.5, "Extra Work."
2. Delays due to utility or railroad interference on the Project Site that are not anticipated as a concurrent move or activity by the Contract.
3. Delays due to an Engineer-ordered suspension as specified in 1402.4, "Suspensions of Work Ordered by the Engineer."
4. Delays due to the neglect of the Department or its failure to act in a timely manner.

3.2.3 Non-Excusable Delays

Non-excusable delays are delays that are the Contractor's fault or responsibility. All non-excusable delays are non-compensable. Non-excusable delays include, but are not limited to:

1. Delays due to the Contractor's, subcontractor's, or supplier's insolvency or mismanagement.
2. Delays due to slow delivery of materials from the supplier or fabricator when the material was available in warehouse stock, or when delivery was delayed for reasons of priority, late ordering, financial considerations, or other causes.
3. Delays due to the Contractor's failure to provide sufficient forces and equipment to maintain satisfactory progress in completing the Controlling Activities.
4. Delays caused by plant and equipment failure or delays due to the Contractor's failure to provide and maintain the equipment in good mechanical condition or to provide for immediate emergency repairs.
5. Delays caused by conditions on the project, including traffic conditions that could be foreseen or anticipated before the date of bid opening. Weather delays are addressed in 1806.3, "Determination of Charges on Working Day Contracts," and 1806.4, "Extension of Contract Time Due to Weather on Calendar Day and Completion Date Contracts."

3.2.4 Concurrent Delays

Concurrent delays are independent sources of delay that occur at the same time. When a non-excusable delay is concurrent with an excusable delay, the Contractor is not entitled to an extension of Contract Time for the period the non-excusable delay is concurrent with the excusable delay. When a non-compensable delay is concurrent with a compensable delay, the Contractor is entitled to an extension of Contract Time, but not entitled to compensation for the period the non-compensable delay is concurrent with the compensable delay.

3.3 Utility Relocations

MnDOT Specification 1507 – Utility Property and Service outlines the requirements for utility relocation on a construction project. The contract will specify the utilities affected by the construction project and direct utility owners affected the project to relocate or adjust their facilities within the project limits at no additional cost to the contractor unless the contract makes the contractor responsible for relocating or adjusting designated utility facilities.

The Department expects utility owners to complete utility relocations and adjustments as indicated in the Contract and requires the Contractor to provide adequate notification of the scheduled work to prevent impacts to the contractor's scheduled construction operations. By submitting a proposal for the project, the contractor acknowledges that it has considered the following:

1. The temporary and permanent facilities identified in the contract,
2. The existing location and designed relocations of all utility facilities as show on the plans, and
3. The precautions required to protect utility facilities in the project site during construction activities.

If utility owners fail to relocate or adjust their facilities as required, and the contractor and Department sustains losses that could not have been avoided by the judicious handling of forces, equipment, and plant, or reasonable revisions to the construction operations, the Engineer will adjust the contract in accordance with MnDOT specification 1402 – Contract Revisions

Chapter 4: Mitigation Efforts During Design and Construction

There are a wide range of ways construction delays can present themselves during the project lifecycle. If action is not taken, these delays will impact the overall project duration. Proper coordination, planning and communication can help mitigate project delays and lead to a project completing on time. Since the COVID-19 pandemic began, the past couple years the industry has been challenging for contractors when bidding construction projects. The pandemic has hindered contractor's due to material shortages, delays in material deliveries, and worldwide supply chain issues negatively impact the project schedule, leading to increased costs to recover lost time and liquidated damages due to projects not being completed within the allowed contract time. While some delays are out of the owners and contractors' control, transparency in communication between the owner and contractor is most critical to project success.

4.1 Mitigation Efforts During the Design Phase

4.1.1 Accuracy of Procurement Durations

During the design phase of a project, there are multiple ways design engineers can potentially help reduce the probability of a contractor missing a completion date deadline. In recent years, multiple world events have impacted material pricing and procurement durations of construction materials throughout the industry and have forced designers to be creative in the way projects are developed. Some may think these global events have no impact on their projects, but they do more often. The most common impacts from these recent events include volatile pricing and longer than normal material procurement durations.

In the last 5 years, material pricing for reinforced concrete pipe (RCP)/precast structures and ductile iron pipe (DIP) have increased over 55%. Material procurement durations are no different. In the last five years, items that were typically "stocked" items now require a 4–6-week lead time.

When an agency is producing the engineers estimate or a time determination schedule, accuracy of the information is always critical. Related to material procurement, fabrication timelines should be confirmed with material suppliers early in the design phase to validate material availability and construction staging.

4.1.2 Accuracy of Contract Time Determination (CTD) Schedules

Taking time to accurately establish and determine the length of a construction project is imperative to completing the project on time. As a part of our industry outreach for this research, we asked contractors what improvements owners implements in their process that would help complete projects on time and the top response was establishing realistic timeframes for work to be completed. 85% of the contractors surveyed noted that contract time determination schedules made by agencies could be

more accurate and would increase the likelihood of a timely completion. Contract time schedules need to include all aspects of the construction project, from project letting to completion of construction. If a construction project requires the contractor to build and maintain a CPM schedule for the duration of the project, the agency should develop their time determination schedule following the same specifications the contractor is required to follow. A handful of these requirements are summarized below:

Working Periods

The duration of a typical construction season in Minnesota is limited and heavily dependent on weather conditions. The construction season is defined by MnDOT specification as April 15 to November 15 of each calendar year. MnDOT Specification 1803.3 provides a table of anticipated days lost per month due to weather related events. These days should be incorporated into the time determination schedule to establish contractual dates for projects.

Accuracy of Quantities and Production Rates Used

The accuracy of production rates plays a crucial role in determining durations for activities in a time determination schedule. Production rates need to be tailored to each project and depend on factors that include but are not limited to the project's geographical location, urban or rural settings and construction staging.

Procurement & Fabrication Lead Times

To ensure a contract time schedule is as close to accurate as possible, it is necessary for agencies to include activities and related schedule logic for material procurement and fabrication. Suppliers are willing and able to provide estimated lead time durations for stock and specialty items such as signals and precast concrete structures to name a few.

Construction Staging

The time determination schedule needs to include all stages of construction. The time determination schedule needs to follow the traffic control plans and staging narrative and have enough detail to accurately estimate how long a particular construction stage should take to construct.

4.1.3 Contract Award Process

The contract award process should be included in the time determination schedule. Most agencies follow MnDOT Standard Specification 1302 – Award of Contract, which allows for up to 33 Calendar Days from project letting to project award. If your agency's award process is different, it needs to be incorporated in the contract time schedule. The length of the contract award process can differ by agency, so specifications should be updated to include the anticipated contract award timeline, so contractors can anticipate when they can receive notice of award.

In December of 2022, the Metropolitan Council reduced their timeline for awarding construction and design projects based on feedback they received from the industry partners. Though an approved policy change, the Metropolitan Council increased signing authority from \$2.5M to \$10M, allowing them to reduce the timeline from bid opening to contract execution. Throughout the years the Metropolitan Council, through conversations with contractors and targeted vendors heard that “it takes too long” to get through the contract process.

In response to our survey sent out to contractors in Minnesota, when asked about recommended improvements Owners could make in their process, multiple contractors responded with the turnaround time it takes for agencies to execute construction contracts.

4.1.4 Early Procurement of Materials (Agency)

Recently with all the supply chain issues, material procurement has been one of the leading causes a project finishes beyond the timeframes established in the contract documents. To adapt the current state of the industry, local agencies have been forced to think outside of the box to mitigate some schedule risk associated with material procurement and decrease the chances of a project finishing late.

4.1.4.1 Case Study #1 – Material Procurement by Agency

During the research period for this paper, the city of Golden Valley was designing a project to add a precast pedestrian tunnel to improve pedestrian access to a local school near TH 55. Like many other projects, the planned construction schedule is condensed to only allow construction from May 2023 to August 2023 to accommodate access to the local school.

A CTD schedule was developed by the Engineer of Record to simulate multiple construction scenarios: staged construction or a full closure of TH 55. Staged construction would require the Contractor to construct temporary crossovers and maintain traffic in a head-to-head configuration for each half of the installation of the pedestrian tunnel. The full closure option was a full closure of TH 55 to facilitate the installation of the pedestrian tunnel and based on the detailed CPM schedule, the closure duration was 14 calendar days.

The city chose to forgo the staged construction option and chose the full closure with the caveat that the box culvert needed to be procured prior to letting of the project due to the duration required to fabricate the box culvert. The design engineer worked directly with the client and box culvert fabricator to begin early procurement. Early material procurement by the agency significantly reduced the risk of the project being delayed due to procurement durations for critical items on the project.

4.1.5 Project Letting Schedule (Early Let, Late Start MnDOT Projects)

It is not uncommon for a project to be let during an “off peak” letting schedule to allow for Contractors to begin procurement of long lead time materials. Recently there has been an increase in these types of Contracts to reduce the probability of a Contractor finishing late due to long lead times for material procurement. The two case studies that were reviewed, required procurement of specialty items that

recently have been linked to prolonged fabrication durations. The Special Provisions for these projects needed to be modified to include the coordination between the material supplier and successful low bidders of future construction projects.

4.1.5.1 Case Study #2 – Agency Let Early Material Procurement Contract

This early material procurement project allowed for early fabrication and timely delivery of three separate signal systems for S.P. 6212-181 on TH 36 in Ramsey County, MN. During the time of this Early Let Material Procurement project, Signal Fabrication lead time was more than 8 months. The signal fabrication example shown below was a key component of a roadway rehabilitation project.

Contract ID: 220133 S.P. 6212-181(EP) – Signal Fabrication

Apparent Low Bidder: Egan Company

Cost: \$417,725.00

The Special Provisions, S-22 (1806) Determination and Extension of Contract Time for S.P. 6212-181(EP) were modified to read as follows:

S-22.1C - "Signal Pole Materials being supplied through this contract must be ready for transport no later than April 15, 2023."

S-22.1D - "The Contract requires the manufacturer to store all signal pole materials at the manufacturer's site such that the owner of the future Contract SP 6212-181 can coordinate the delivery. Storage will be for no later than July 1, 2023."

S-22.1E - "This Contract requires the owner of future Contract SP 6212-181 to coordinate a delivery date and transportation of signal pole materials from manufacturer's storage location to SP 6212-181 project site."

4.1.5.2 Case Study # 3 – Agency Let Early Material Procurement Contract

This early material procurement project allowed for fabrication of five precast concrete box culverts for a roadway rehabilitation project on TH 32 near Strathcona, MN. Early in the design phase, the design team realized the fabrication of these box culverts would have a major impact on the completion date of this project if they were fabricated with the original construction contract. Precast box culvert procurement durations at this time ranged anywhere from 5 to 7 months, so to help mitigate the schedule risk; they pulled the fabrication of five precast box culverts from the original set of plans and created an early letting to allow enough time for box culvert fabrication. Bid letting for S.P. 4054-45X21EP was 9/23/22 and would allow the successful low bidder enough time to get the fabrication process started. The early procurement project was directly tied to S.P. 4504-19 and required the low bidder of 4504-19 to coordinate the delivery of the precast box culverts with the material supplier of 4504-45X21EP.

Contract ID: 220114 S.P. 4504-45X21EP – Box Culvert Procurement

Apparent Low Bidder: Landwehr Construction

Cost: \$1,858,696.00

The Special Provisions, S-22 (1806) Determination and Extension of Contract Time for S.P. 4054-45X21EP were modified to read as follows:

- S-22.3 - *“Box culverts being supplied through this Contract must be ready for transport no later than July 10, 2023.”*
- S-22.4 *“This Contract requires the owner of future Contract S.P. 4504-19 to coordinate a delivery date and transportation of box culvert from manufactures facility to S.P. 4504-19 project site.”*

4.1.6 Utility Coordination

Agencies should be aware the risk of utility relocation during construction and how private utilities, for example, can be moved ahead of time, mitigated through design, or conflicts called out better in the plans. Most often though this risk is placed completely on the contractor with generic language that says all coordination is the responsibility of the contractor and very little information is given to the size, location, or depth of the utility.

MnDOT has developed the Utility Accommodation and Coordination Manual to help reduce the time designers spend on utility coordination. By identifying early milestones for utility coordination meetings and follow up, project managers and designers can avoid time-consuming efforts to resolve utility issues that occur during the construction phase of the project. When it comes to utility relocation during the construction phase, nearly all of the contractors who responded to our industry outreach survey responded that utility conflicts are a growing problem and can be mitigated through better up-front and improved partnership between contractors and agencies.

Expectations for early utility coordination need to be established early in the design process. Owners, Contractors and utility owners often times misinterpret the intent of MnDOT specification 1507 related to the coordination. The Owner is responsible for the coordination of relocates and how the sequencing of the relocates should happen. After the construction project has been awarded to the apparent lowest bidder, the prime contractor needs to be included in the discussions between the owner and utility companies that are required to relocate for the project. This will allow the prime contractor to communicate their construction sequencing with the utility companies so they can establish a relocation sequencing of their own to minimize the chances of impacting the prime contractors schedule.

4.1.7 Constructability Reviews

Constructability reviews should be performed by an experienced contract administrator or a senior level construction inspection during the final stages of the design phase. Of the contractors that responded to our survey questionnaire, 78 % of the contractors stated that errors, omissions, and ambiguities are becoming more prevalent in construction plans and is leading to contract disputes and projects completing later than planned. To improve the quality of plans, constructability reviews need to be built into the QA/QC process during design if the work is being performed inhouse. If design is completed by

a consultant, agencies should perform quality reviews throughout the design process to help catch those fatal flaws in the design that end up leading to the disputes during construction.

4.2 Mitigation Efforts During the Construction Phase

4.2.1 Notice of Delay

If a contractor is going to miss a completion date deadline and file a claim or request for time extension, they need to notify the Engineer. As outlined in MnDOT Specification 1517 – Claims for Compensation Adjustment, the contractor is required to notify the Engineer in writing of any intent to file a claim for compensation or time extension. The Contractor is not entitled to compensation or a time extension if:

1. The Contractor fails to notify the department.
2. The Contractor's actions or inactions prevent the Department from keeping strict account of the impacts and costs of the disrupted work.
3. The Contractor's actions or inactions prevent the Department from mitigating the impacts and costs of the disputed work.

4.2.2 Resequencing of the Work

Delays to construction projects are not uncommon. As defined in MnDOT Specification 1806 – Determination and Extension of Contract Time, Mitigation of delay, whether caused by the Department, Contractor, a third-party, or an event, is a shared contract and legal requirement. Mitigation efforts include, but are not limited to, re-sequencing work activities, acceleration, and continuation of work through an otherwise planned shutdown period. The Contractor and Engineer will explore and discuss potential mitigation efforts promptly and agree upon costs or cost-sharing responsibilities prior to the implementation of mitigation efforts.

When working with a contractor to re-sequence work, it is imperative there is collaboration between both the contractor and the department. Both parties need to be transparent on what the goals and expectations of the revised schedule to ensure that the revised plan can be executed. The most current construction schedule, bar chart or CPM, should be used to accurately establish what resources are needed to meet the planned dates.

If the controlling operation is impacted, and the completion date is anticipated to complete later than planned, agencies and contractors need to work together to collaborate on how the project schedule can re-sequenced to meet the milestones outlined in the contract documents.

Chapter 5: Understanding and Administering Liquidated Damages

5.1 Liquidated Damages

Regarding the assessment of liquidated damages, 67% of local agencies surveyed responded by saying that it conflicts with their effort to maintain partnerships with their contractors. It's equally important to understand the reason for the delay and adjusting for excusable delays when the contract allows. This obviously can get very complicated on large complex projects, but transportation agencies should be setting the tone early in the project and being consistent with the administration.

Of the contractors surveyed, 78% believe local agencies take a different approach to the assessment of liquidated damages, and it would be beneficial to all parties if expectations were more consistent.

Unless there is a contract revision as defined in MnDOT Specification 1402 – Contract Revisions, liquidated damages must be withheld in accordance with contract documents. Most, if not all, contracts include a clause related to liquidated damages like MnDOT specification 1807.1 Assessment of Liquidated Damages. The Department will deduct liquidated damages from money due to the contractor for each calendar day that the work remains incomplete after the contract time expires.

The *MnDOT Contract Administration Manual* states, “The Department is entitled to damages for the failure of the Contractor to complete the Work within the Contract Time. The Department will assess a daily charge, not as a penalty, but as LDs to compensate the Department for the additional costs incurred.”

In accordance with MnDOT Specification 1807.2, Waiver of Liquidated Damages, only the department may waive all or any portion of liquidated damages after the date the work has reached substantial completion. It is not uncommon for liquidated damages to be used a bargaining chip when negotiating a completion date of a project after it is finished. From a consistency standpoint, negotiating out liquidated damages is a detriment to the contractual language and sets the tone for what can be expected the next time a project overruns a completion date and finishes late.

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