

**FACILITIES DESIGN MANUAL**

**RESPONSIBILITIES DURING**

**DESIGN AND CONSTRUCTION**

**VERSION 1.0 - DRAFT**

**MAY 18, 2017**

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**PREFACE**

The intent of this manual is to provide guidance to all employees of Facilities Design as it relates to the unique operational requirements of Facilities Design.

This manual supplements other Department Manuals, and Intranet available documents. This manual will be expanded to address new topics at the discretion of the Transportation Principal Engineer of Facilities Design.

An Excel file list of activities has been developed to assist the Project Engineer during both the design and construction phases of a project. Refer to “Design Activities and Duties During Construction.xls” for this file.

Note to Readers:

While this document is preliminary in nature, it does contain valuable guidance for Designers and Project Engineers. Please forward any comments or concerns.

**FACILITIES DESIGN SAFETY FUNCTION**

**Connecticut Department of Transportation**

**Bureau of Engineering & Construction**

**Division of Facilities and Transit Office of Facilities Design**

**Mission:**

Investigate and pursue opportunities to improve safety at Connecticut’s highway support and transit facilities for all public and employee users.

**Purpose:**

The Division of Facilities and Transit Office of Facilities Design primary safety function is to construct new facilities and to renovate existing facilities to comply with the following:

1. State Building Code as adopted pursuant to CGS 29-252, as amended.
2. State Fire Prevention Code as adopted pursuant to CGS 29-291a, as amended.
3. Fire Safety Code as adopted pursuant to CGS 29-292, as amended.
4. Department of Justice “ADA Standards for Accessible Design.”
5. FM Global Property Loss Prevention Data Sheets.
6. NFPA Standards.

**Goal:**

The goal of the program is to promote the health and safety of the people of Connecticut that use the highway support and transit facilities.

**Organization Structure:**

In January 2017, staffing within the Division of Facilities and Transit Office of Facilities Design consists of (36) engineers; 1- Transportation Principal Engineer, 6-Transportation Supervising Engineers, 16-Transportation Engineer 3, 6-Transportation Engineer 2, 1-Transportation Engineer 1, 6-Transportation Engineer Trainees. On-call and task-based consulting engineering firms provide engineering services to assist in the delivery of capital projects.

**Design Requirements:**

*State Building Code*

The State Building Code is used to ensure that the design of capital projects complies with the building, electrical, mechanical, plumbing, and energy code requirements necessary to promote the health and safety of the people of Connecticut.

*State Fire Prevention Code and State Fire Safety Code*

The State Fire Prevention Code and the State Fire Safety Code are used to ensure that the design of capital projects complies with the codes, standards, and regulations to reduce the harm associated with fires, explosions, and mechanical failures.

*Department of Justice “ADA Standards for Accessible Design”*

The Department of Justice “ADA Standards for Accessible Design” sets minimum requirements, both scoping and technical, for newly designed and constructed or altered State facilities to be readily accessible to and usable by individuals with disabilities.

*FM Global Property Loss Prevention Data Sheets*

FM Global is the property insurance carrier for the State of Connecticut. FM Global publishes engineering guidelines to help reduce the risk of property loss due to fire, weather, and/or equipment failure.

*NFPA Standards*

National Fire Protection Association (NFPA) develops and publishes consensus codes and standards intended to minimize the possibility of fire and other risks.

**Gaps, Threats, and Opportunities for Improvement:**

* Division of Facilities and Transit Office of Facilities Design provides design-relates services for multiple bureaus, resulting in competing priorities. These bureaus are: the Bureau of Engineering (such as movable bridges and vertical projects in conjunction with roadway and rails-to-trails projects), the Bureau of Public Transportation (such as ports, ferries, bus facilities, parking garages, railroad stations, railroad maintenance facilities, railroad track and catenary work), and the Bureau of Finance and Administration (such as maintenance and repair facilities, salt storage facilities, office buildings, rest areas, weigh stations).
* Incomplete asset management information on existing facilities impacts the decision making process related to the need for new facilities or the need to renovate existing facilities; which facility is next?
* Funding constraints delay the ability to construct new facilities and to renovate existing facilities as quickly as necessary.
* Staffing level may delay the ability to construct new facilities and to renovate existing facilities as quickly as necessary unless consultants are used.

Refer to “safety section summary sheet.xls” for additional information.

**GENERAL ADMINISTRATIVE**

**Electronic Messages**

This policy defines Electronic Messages (e-mail, fax, instant-messaging [IM], text messaging [SMS], voice mail, and Web-based messaging services). Refer to IT Policies and Standards on the ct.gov/BEST website: <http://www.ct.gov/best/site/default.asp> Such applicable technology and Internet related policies and guidelines include:

Disposal of Digital Media Policy

Electronic & Voice Mail Management and Retention Guide

Electronic Mail Records Management Policy

**Project Files**

Refer to **Freedom of Information** for information related to project files. The following classifications of project files exist:

Exempt Records: Project Engineer project files, Designer project files and calculations.

Exempt Records are those records that are exempted from Freedom of Information rules (Section 1-210 and 1-211 of the Connecticut General Statutes). Refer to [www.cga.ct.gov](http://www.cga.ct.gov) for a current listing of exempt records. The following list is provided as a guideline of exempt records:

1. Preliminary drafts of notes provided the public agency has determined that the public interest in withholding such documents clearly outweighs the public interest in disclosure.

1. Records pertaining to strategy and negotiations with respect to pending claims or pending litigation to which the public agency is a party until such litigation or claim has been finally adjudicated or otherwise settled.
2. Commercial or financial information given in confidence not required by statute.
3. The contents of real estate appraisals, engineering or feasibility estimates and evaluations made for or by an agency relative to the acquisition of property or to prospective public supply and construction contracts, until such time as all of the property has been acquired or all proceedings or transactions have been terminated or abandoned, provided the law of eminent domain shall not be affected by this provision.

Exempt Records shall be filed separately so that their confidentiality is maintained.

Non-Exempt Records: Project Engineer project files, Designer project files and calculations

Non-Exempt Records are all remaining records.

It is the responsibility of the Project Engineer to maintain the Exempt and Non-Exempt project files for eventual archival at Pascone Place. The project files shall be complete with all correspondence, e-mails, etc.

Although Designers are permitted to maintain their own Exempt and Non-Exempt project files, copies of all pertinent information shall be included in the project files maintained by the Project Engineer.

Refer to “Correspondence File Index.xls” for a sample index for both Non-Exempt and Exempt Records.

**Freedom of Information**

Refer to the current Policy Statement No EX.O.-14 for an explanation of the ConnDOT policy on Freedom of Information (FOI) requests. This policy is available from the “Documents and Forms” button on the ConnDOT Intranet. The following procedure shall be followed upon receipt of a FOI request:

1. The Transportation Principal Engineer is made aware of the FOI request. Under the FOI rules, requests for information need not be in writing. However, if the request is unduly complex such that there is room for misunderstanding, it seems reasonable to ask, but not require, that the requester write it out. The FOI request must first be forwarded to the Office of Legal Services if it did not come through them.
2. The Design Project Engineer will forward the FOI request to other Department offices, consultants, sub-consultants, and others as applicable.
3. The Project Engineer will send an acknowledgement letter to the requester. Refer to “FOI Acknowledgement.doc” for a sample letter.
4. The Design Project Manager and the Design Project Engineer will review the requested records for compliance with the provisions of Section 1-210 and 1-211 of the Connecticut General Statutes. Refer any questions about whether or not a piece of correspondence is exempt from FOI to the Transportation Principal Engineer.
5. The Design Project Engineer will contact the requester to schedule an appointment to review the requested records from all applicable offices.
6. During the appointment, an individual that is not familiar with the project will accompany the requester. The requester will review the records and flag those records that the requester wants copied. The requester will be advised that a fee will be charged per copy. The current fee is $0.25 per copy. Verify that the fee has not changed before informing the requester.
7. The Design Project Engineer will make arrangements for the copying to be completed. If an exorbitant number of copies are required, ConnDOT Printing Services shall be used. When making the copy request, the Design Project Engineer will advise ConnDOT Printing Services of the need for a sheet count.
8. Once the copying is complete, the Design Project Engineer will contact the requester, provide a sheet count and a total cost. Payment shall be made by check made payable to “Treasurer, State of Connecticut” for the exact amount. Do not accept cash. The Design Project Engineer will make arrangements with the requester to pick up the records or to make arrangements to have the records mailed. Refer to “FOI List Transmittal.doc.” for a sample letter.

9. After receiving payment for an FOI request, the Design Project Engineer will write a memorandum transmitting the check to the Accounts Unit of the Bureau of Finance and Administration. The Accounts Unit must receive the check within 24 hours of receipt. Refer to “FOI $ to Accounts Unit.doc” for a sample memorandum.

**Electronic Records**

Project Related

All electronic records for a specific project shall be stored in its respective project directory or directories on the appropriate network drive(s). This is necessary to allow the Design Project Engineer to more effectively manage the overall project, to properly archive projects upon completion, and to minimize the amount of redundant files.

Duplicate copies of records are not to be created or stored on local hard drives. Doing so could lead to serious problems over the course of a project and especially after a project is complete.

No employee of Facilities Design shall tamper with another employee’s records without the express consent of the author of the record. This will include copying, editing, or deleting of the records.

Non-Project Related

Electronic records not directly related to individual projects shall be stored in non-project related directories.

Transmission to Outside Party

Any electronic file sent out from the Office of Facilities Design to an outside party shall include a copy of the Office of Information Systems’ disclaimer. This disclaimer (“Electronic File Disclaimer.pdf or .doc”) outlines the conditions under which any party receiving electronic files from ConnDOT must adhere to.

**Policy on Records Retention**

Refer to the current Policy Statement No F&A-26 for an explanation of the ConnDOT policy on Records Retention. This policy is available from the “Documents and Forms” button on the ConnDOT Intranet.

The following records are permanently-archived in the Office of Facilities Design:

1. In-house Designer calculations.

2. In-house Designer project files.

3. Construction photographs (Hardcopy thumbnail indexes and CD-ROMS).

The following records are permanently-archived at Pascone Place:

1. Project Engineer project files of project correspondence.
2. Design Reports, Environmental Assessments, FONSI’s, Environmental Permits.
3. Consultant Financial Records.
4. Consultant Designer calculations.
5. Specifications – Final, including Addenda and Change Orders.
6. Contractor Submittals.

The process to archive records at Pascone Place is as follows:

1. The Design Project Engineer will place all records is the correct file storage boxes.
2. The Design Project Engineer will complete a separate “RSL50-108 (Blank).xls” Records Storage List for each project. Refer to “RSL Guidance – full.pdf” for additional information.
3. The Project Engineer will transmit the Records Storage List to the Records Coordinator at Pascone Place. Refer to “Store Files at Pascone Place.doc” for a sample memorandum. An E-Mail may also be transmitted in lieu of a memorandum.
4. The Records Coordinator will completed Records Storage List back to Facilities Design. The Records Coordinator will prepare a completed PRO-54, and will send the PRO-54 to the Director of Property and Facilities Services. A blank PRO-54 can be found on the ConnDOT Intranet under “Documents and Forms – Property and Facilities Services.”
5. The Design Project Engineer will label the file storage boxes in accordance with the requirements.

A copy of guidance documents, previous Record Storage Lists, and file box storage locations at Pascone Place is filed in Facilities Design.

**Digital Memo/Digital Letters Process for Facilities Design**

Create Word document of memo/letter

* Save to Projectwise project folder directory under subfolder “330\_Design Data/Facilities/01- Correspondence – Working,” or save to S-drive or X-drive (as you always have done)
* Following is a link to an internal memo template: [pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00 - Engineering Libraries\Engineering Templates\Facilities\C-01\_Letterhead-BLANK.doc](pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00%20-%20Engineering%20Libraries\Engineering%20Templates\Facilities\C-01_Letterhead-BLANK.doc)
* Following is a link to blank letterhead document for digital letters: [pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00 - Engineering Libraries\Engineering Templates\Facilities\C-03\_Internal Transmittal Memo2 Template.doc](pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00%20-%20Engineering%20Libraries\Engineering%20Templates\Facilities\C-03_Internal%20Transmittal%20Memo2%20Template.doc)

Email for typing

* Send Secretary email with link to draft document
  + Email subject line shall start with: “**For Typing:”**
* Secretary types document and Saves file in current location (in Projectwise, S-drive, or X-drive)

Create PDF

* Secretary opens Word document and Save As PDF:
  + Upload PDF to Projectwise Facilities Digitally Signed Memos folder: [pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00 - Engineering Libraries\Facilities\Digitally Signed Memos\](pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00%20-%20Engineering%20Libraries\Facilities\Digitally%20Signed%20Memos\)
* Secretary creates signature blocks in PDF next to all individuals required to digitally sign
  + Click “Document”, “Signatures”, “Add Signature Field”, then create blocks
* Secretary shall send email to notify author when PDF has been created
  + Email shall include link to PDF in Projectwise

PDF storage

* Add attachments to PDF
* All digital memo and digital letters PDF’s shall be stored in Projectwise
  + If no Projectwise project folder exists or it is non-project related, PDF shall remain in Projectwise Facilities Digitally Signed Memos folder: [pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00 - Engineering Libraries\Facilities\Digitally Signed Memos\](pw:\\ctdot.projectwiseonline.com:CTDOT\Documents\04.00%20-%20Engineering%20Libraries\Facilities\Digitally%20Signed%20Memos\)
  + If Projectwise project folder exists, move PDF to Projectwise project folder directory under subfolder “140\_Project\_Administration” (“340\_Administration” for older projects) or “141\_Project\_Administration\_Confidential” (“341\_Administration\_Confidential” for older projects) (Note the “Confidential” subfolder is typically limited to only DOT personnel and can be even more limited, consultants will typically not be allowed access)
* Attribute PDF in Projectwise per Appendix E Table 7 in the Digital Project Development Manual: <http://www.ct.gov/dot/lib/dot/documents/aec/Digital_Project_Development.pdf>

Email for signature

* Send email to appropriate people for signature and cc: Secretary
  + Email subject line shall start with: “**For Signature:**”
  + Email shall include some variation of the following:
    - “The memo [letter] for the subject project is ready for review and digital signature at the link below. Please review, sign, save the memo [letter] replacing the existing version, and then forward this message to the next appropriate person for signature. After all signatures are made, please forward this email back to me.”
  + Email shall include link to PDF in Projectwise

Apply digital signatures

* Multiple signatures are typically required, and the first person to digitally sign shall use a “certifying signature”, and all additional shall be “signing signatures”
* To sign with “certifying signature”:
  + Click in signature field, toggle “Document Certification”, log in password, click OK, and save replacing the existing version
* To sign with “signing signature”:
  + Click in signature field, toggle “Digital Signature”, log in password, click OK, and save replacing the existing version
* Upon completion of all digital signatures, the last person to sign shall forward email back to author of the original email and cc: Secretary

Signed PDF distribution

* Secretary shall send email with a copy of PDF attached and include a link to file in Projectwise to appropriate people
* Secretary shall print hardcopies of letters and send through mail to appropriate people

**-or-**

Secretary shall create a copy of signed PDF with bcc list page removed and send copy through email to appropriate people

* + Open signed PDF, Click File, Print, toggle to printer "Bluebeam PDF", click Advanced, toggle on Printing Engine “Image”, toggle on "Auto-Select Paper Size", toggle on page range "Custom Range" and select pages to print, Save as copy

**Publication Orders such as Codes, Reference Standards, Cost Estimating**

Publication Orders require Bureau Chief Approval.

**Ten Rules for Employees**

1. Never Let Your Superior Be Surprised: Make it a rule never to let your superior be taken by surprise about anything that has happened, or is about to happen, in connection with your work. Supervisors must know at all times what is going on. If things are going well, that very fact will free them up to handle more important matters. Nothing is quite as embarrassing to a superior as to learn from others of something that had happened within the unit that is a surprise.

2. Admit Your Mistakes – Frankly and Promptly: It is always wise to go to your superior and acknowledge a mistake as soon as you discover you have made it. Any supervisor realizes that everyone makes mistakes, and will respect the person who admits it. A mistake promptly admitted can usually be rectified before it has done any great amount of harm. Also, you establish with your supervisor the fact that you are a reliable person and that you put the welfare of your department before your personal pride. Admit your mistakes, but be sure that it does not happen again.

3. Have a Recommendation Ready: Whenever you go to your superior with a problem, or for advice, first think the situation through to the point where you have your own solution to suggest. Get all the facts and organize them so that they are clear and can be quickly grasped. Now go to your supervisor with a definite recommendation. It will be plain that you are not taking your supervisor’s time until you have given the matter your best thought. With your superior it may be better not to make a definite recommendation until it is requested, but be ready with your suggestion for a solution. Following this plan will not only help in your relationship with your superior; it will show that you are interested in your work; that you are on top of your job, and that your are trying to carry your share of the management load.

4. Have At Least One Alternate Plan: The human mind is a lazy mechanism. When it works out a solution to a problem, it slips into neutral, because the problem is “solved”. However, the best that can be said is that one solution has been found. It is not necessarily the best solution, or even the right one. Usually there are two or three ways of solving any problem, or working out any project. All of them may be feasible, or good but only one of them can be best. It is well to work out the first plan in detail, as though it were the only plan, but when this has been done, start all over again and develop a second or third one. Not only may this produce a better solution, but it is also a way to build a reputation as a person capable of overcoming difficult problems.

5. If You Don’t Know – Admit It: One of the greatest temptations for anyone is to appear to know all the answers. Not knowing the answer to a question is not serious, but pretending that you know may prove very serious. You may “get away” with an ignorant answer temporarily, only to be embarrassed later. Your reputation for being dependable is jeopardized. “I don’t know – but I’ll find out” is the most important sentence that anyone seeking to advance can learn to use, providing you do find out.

6. Have the Facts and Figures Ready: If you know of any problems or projects that your superior is likely to being up, go ahead on your own initiative and gather the facts, or make calculations or rough sketches. There are countless opportunities in any organization to anticipate needed information and to have it ready. Sometimes it is safe to go ahead on one’s own; in other instances it will be wiser to go to your superior and ask if it would be helpful if you started to work up the material.

7. Make It a Rule to Date Everything: Make it a practice every time you receive and read a letter, memorandum, report, or set of instructions to note your initials and the date. You will be forming a valuable business habit which is particularly important where various revisions are concerned. If each revision bears its date, there will never be any question as to which is the final one.

8. Don’t “Pass the Buck” – Grab It: It is not necessary to assume the responsibility for mistakes that are not yours. But if you want to earn the respect of your superiors make it a rule to promptly “grab the buck” in any situation where the blame is even remotely yours. By doing so, you will show yourself as a person with the courage to assume the responsibility even when things go wrong.

9. Write One-Page Memos: In business it is more difficult to write a short letter, report, or recommendation than it is to write a long one. It takes longer, but it increases the chances of having your recommendations read and accepted. The one-page rule is recommended for all memoranda you prepare because it will save much of your superior’s time. Of equal importance, it will train you to think things through in clean-cut fashion. Remember, however, to always have available the working papers on which you base your presentation, in case they are called for.

10. Pass along All Good Suggestions: When you pass along a good idea suggested by someone under you, and give proper credit for it, you establish yourself as a person big enough to share your success and progress with your subordinates. You increase the respect of your assistants for you as a supervisor, and earn their complete cooperation. This does not mean that you should pass along every idea or suggestion. Some of them will not be sound or practical; others may have been tied before and found unusable. In such instances, it is important to take the time to point out why the idea cannot be used. Thus the employee making the suggestion is not discouraged from making future contributions.

**DESIGN PHASE**

**Main Project Engineer Activities (list may not be complete)**

1. Prepare and update a Status Report for the project. Refer to “Blank Status Report.xls” for the correct format.
2. Use DOT Viewport or Composite Project Data (<http://dot-sdcdts-30v/PW_CompositeData> to monitor project expenditures to alert Project Manager to the need of a Project Modification.
3. Develop project schedule using Facilities Design template in Microsoft Project.
4. Be the point of contact for all Designers, other ConnDOT, and outside agencies.
5. Be the point of contact for the Consultant Project Engineer, if applicable.
6. Hold Designer Coordination Meetings a minimum of once per month on in-house design projects to keep the project on course (schedule, scope, budget, etc.).
7. Be responsible for coordinating the various Designers involved in the project to eliminate redundancy and contradictions on the plans and in the specifications.
8. Be responsible for providing direction to the Designers when there is an apparent conflict between Designers.
9. Be responsible for a QA/QC review in an attempt to eliminate errors, providing a final check of all work, and to put a complete set of plans, specifications, and estimate together at each Project review phase and at FDP.
10. Distribute the intermediate submissions for review.
11. Distribute all review comments received to the appropriate parties for response. The Project Engineer is responsible for ensuring that every comment received is addressed in writing by the Designer, and that said responses be transmitted to the originator of the comment prior to the next scheduled review submission.
12. Be responsible for conducting project review meetings.
13. Submit project at FDP.
14. During the Bidding Phase, forward bidder questions to the appropriate Designer for review. Upon receipt of an acceptable response upload the response to the ConnDOT Pre-Bid Q&A website.
15. Coordinate the preparation of any Addendum.
16. Keep the Project Manager advised of all issues.

**General Designer Responsibilities**

Each Designer is responsible for their area of expertise. For example, if a particular discipline (civil, architectural, mechanical, or electrical) requires the design of a structural component (slab, retaining wall, light pedestal, equipment hanger, etc.), the Designer will confer with the Structural Designer, and the Structural Designer will include the necessary design on their plans and in their specifications. No one should be designing outside their area of expertise. “Cook Book” designs from manufacturers for equipment foundations, supports, frames, etc. will also be reviewed to ensure code compliance and acceptability of the design.

Each Designer will consider the impacts to the project, including financial and schedule, when considering a design change. Each proposed design change will be discussed with the Project Engineer prior to implementation so that they may evaluate its need versus its impact on the other disciplines involved in the project.

It cannot be stressed strongly enough about the need for communication and coordination throughout the design process.  We are one team working within the same building.

Metric references are no longer required.

Refer to the “Digital Project Development Manual.”

**Continuous Improvement**

Each Designer shall keep a record of all changes that need to be made such as corrections and missing details to their plans and specifications throughout construction to clarify design documents for future projects. All Designers of the same group need to share this information to revise other projects accordingly.  Similarly, all design comments need to be shared as well.

**Plans**

Depiction of Project Work on the Plans:

1. Redundancy must be avoided to prevent contradictions between disciplines or between the plans and the specifications. Plans may be more straightforward than “wordy” specifications. Many contractors are more visual.

2. All work relative to a specific discipline will only be detailed on that particular discipline’s plans. For example, structural components will not be defined in detail on architectural, mechanical, or electrical plans. Having details on the wrong plans has resulted in oversights by subcontractors during the bidding process since subcontractors typically only see part of the Contract set of plans, which has resulted in claims during construction. Instead, cross-reference between discipline plans and provide notes to facilitate the construction process.

3. When necessity requires a component to be shown on another discipline’s plans, reference should be made in a general manner. For example, the architectural plans should reference a joist as a “steel joist.” The structural plans would provide the size, shape, length, spacing, etc.

Do not use the terms “New” or “Proposed” to describe Contract work. All work shown on the plans is assumed to be new unless it is labeled “Existing” or “Not in Contract (NIC).”

Civil Designers shall include “Highway Standards” and “Traffic Standards” as required on each project.

**Special Provisions (including CSI-formatted Specifications)**

Proprietary Specifications: No proprietary products will be included in a Contract without prior written approval by the Engineering Administrator. Refer to “Proprietary Products in Construction Projects.pdf” for additional information.

Description of Project Work in the Specifications:

1. Redundancy in specifying materials must be eliminated.

2. Materials will not be specified in more than one specification section. For example, concrete will only be specified in CSI Division 03. Many of the CSI-formatted specifications are written as stand-alone specifications (e.g. contain requirements normally found in other specification sections). All firestopping shall be in CSI Division 07.

Basis for Specifications: To minimize the possibility of including obsolete specifications or incorrect requirements into a Contract:

1. Whenever possible, CSI-formatted specifications will be based on the current edition of the MasterFormat 2004 version of specifications from ARCOM MasterSpec, modified to reflect ConnDOT specific revisions that have been made for prior projects. ARCOM MasterSpec will also be used as the basis for development of civil special provisions.

2. Designers are encouraged to follow the Mechanical Designers who have successfully created a set of “Standard Mechanical Specifications” that are set up for quick editing with bold text and edit guides. ConnDOT specific revisions, typically based on review comments and construction questions, are color-coded blue so that the knowledge is not lost with the MasterSpec updates.

3. Old catalog information for materials will not be relied upon without checking the material’s availability online.

4. Consider writing specifications based on salient characteristics.

5. Product Samples: The Contract specifications shall only request product samples (particularly architectural) for materials that are really needed. Unnecessary samples do not add value to the project, waste Contractor and Designer time, and take up valuable storage space.

**BoilerPlate Specifications**

The Standard Specification Committee (SSC) representative for Facilities Design needs to know whenever a Designer is making changes to Section 1. The SSC representative needs to know that projects consistent with Committee requirements are being produced.

When a Project Engineer uses any of the BoilerPlate documents to develop a project, the Project Engineer shall provide the SSC representative with feedback if information is out of date or if you have developed new documents that you believe would be beneficial in the standards for future projects.

Refer to the following for the active BoilerPlate directories:

ALL PROJECTS

This is the current BoilerPlate that is to be used on all projects. It has been rewritten at the direction of the Standard Specifications Committee to eliminate the majority of the Notice to Contractors by relocating the requirements into the special provisions.

RAILROAD PROJECTS

This is the provisions specific to railroad projects. These provisions may be obsolete as they have not been updated in a while.

SPECIFICATION TRAINING GUIDELINES

This includes a Standard Specifications overview, a Special Provisions overview, and Designer editing guidelines.

**Cost Estimating**

Cost estimates will be prepared using a mixture of ConnDOT Unit Price Items and the most recent Means Cost Estimating Guidelines reference guide for the lump sum items.

The cost estimate submitted by the Designers at each phase shall be 100% complete. For incomplete work, Designers shall include “Design Contingencies.” Coordinate any uncertainty with the Project Engineer.

At FDP the Design Project Engineer is responsible for loading the project estimate into ConnDOT Estimator.

**Intermediate Submissions (10%, 30%, 60%, 90%)**

Designers submit plans, specs, and estimates (PS&E) to the Project Engineer no later than the schedule “Designer Due Date.”

Designers are encouraged to get a handle on any project unknowns (such as utility coordination, hydrant flow tests, septic system percolation tests, unique features never designed before, or any potential show stoppers) or due to the impacts of new Building and Fire Codes prior to 60% to avoid project delays and late cost estimate increases.

During the review phase, it is the responsibility of the Designer and their TE3 to perform a PS&E review of their discipline as well as to perform a coordination/constructability review of the remaining related disciplines.  The interim submission will not be delayed for the TE3 to do an initial review.

During the review phase, the Project Engineer will perform a PS&E review concentrating on coordination/constructability.  The Project Engineer should also review the scope of work, including modifications from reviewer comments, and the “Major Capital Program Design Manual” (where applicable) at the 60% or 90% review phase to verify compliance.

To the greatest extent possible, designs shall be 100% at the 90% design review meeting to give the reviewers the opportunity to review and comment on the entire project. The result is that the design effort between 90% and 100% will primarily be to incorporate review comments.

Designers shall review in-house and consultant designed projects and offer comments at each review phase of the project. On consultant designed projects, these comments will be directed to the Project Manager (Transportation Supervising Engineer) for the project. Refer to “Review Comment Form Page 1&2.doc” or “Review Comment Form Page 1&2.xls” for sample Microsoft Word and Excel versions of blank comment forms. On in-house designed projects the Designer will have the option of providing more informal review comments (mark-ups to plans and specifications) to the Project Engineer instead of writing formal comments. Under no circumstance should design review comments be E-Mailed, faxed, mailed, or otherwise communicated to a consultant or outside unit/organization by an individual Designer.

**FDP Submissions**

Designers submit PS&E to their respective TE3 early for a final review so that the PS&E can be submitted to the Project Engineer no later than the schedule “Designer Due Date.”  “Early” will be defined by the respective TE3’s so that time is permitted to incorporate the applicable comments.  At this phase the Project Manager is most concerned that the submission is complete and technically accurate to avoid paying extras to the Contractor.

During the period of time between the “Designer Due Date” and “FDP Date” the Project Engineer has little to no time to perform any coordination/constructability review.  Therefore, it is the responsibility of the TE3’s to review any outstanding issues beforehand.

**Contractor Inquiries after FDP**

After a Project’s FDP date, the project has entered into the “bidding phase.” Once a project enters into the “bidding phase,” any and all contractor, manufacturer, and vendor inquiries shall be directed to the Office of Contracts for proper disposition.

1. The Office of Contracts shall direct contractors, manufacturers, and vendors to submit their questions to them in writing using the ConnDOT’s Q&A System.

2. The Office of Contracts will forward these questions to the Office of Contract Development.

3. The Office of Contract Development may have sufficient expertise to address the issues and respond immediately back to the Office of Contracts. However, it is anticipated that the majority of questions will be forwarded to the Design Project Engineer for resolution, coordinating with any office affected by the question.

4. The Design Project Engineer will answer the question in the ConnDOT Q&A System.

* For bidder questions received within 10 calendar days of the bid opening, the following is an acceptable response providing that the Transportation Principal Engineer concurs:

*“It has been concluded that there is insufficient time to address this question and that the overall impact to the project that this question has does not warrant a postponement of the bid date.”*

5. The Design Project Engineer will coordinate the preparation of an addendum if required.

A proper response to a contractor, manufacturer, or vendor inquiry shall identify, at the very least, a specific specification in the Contract or the appropriate notes and details on the plans.

**Addenda Preparation and Submittal**

General

After projects have been Advertised and prior to Bid Opening, changes to the Contract shall be issued as an addendum.

In order to avoid the unnecessary postponement of bid openings, addenda will be provided to all bidders as expeditiously as possible. The amount of lead-time required by bidders to adequately respond to an addendum is a function of the complexity of the addendum and must be considered on a case-by-case basis. Designers preparing the addendum should allow sufficient lead-time for the processing of the addendum by both the Contract Development/Cost Estimating Section and the Contracts Section. FHWA, FAA, or FTA approvals, if required, should also be accounted for in establishing submission dates for the addendum.

Once the need for an addendum is established, the Design Project Engineer shall coordinate with the Contract Development/Cost Estimating Section to establish a date as to when the addendum will be submitted. An addendum number will also be assigned at this time. The Contract Development/Cost Estimating Section will coordinate with the Contracts Section of the Office of Contract Administration to determine the date of submittal of the addendum to the Contracts Section.

All addenda shall be transmitted from the appropriate Transportation Principal Engineer to the Contract Development/Cost Estimating Section. The Transportation Principal Engineer of Contract Development/Cost Estimating shall be the approving authority for an addendum, except in those cases where Full Oversight is required. In these cases, the FHWA, FAA, or FTA shall give the final approval to the Office of Contract Administration.

Changes to contract documents should be performed by the Designer who shall prepare all plans, specifications, quantity takeoffs and cost estimates, and justification statements to be included in the addendum.

Plans and Specifications Development

Refer to the “Digital Project Development Manual,” Section 4 Contract Plan and Specification Revisions (Addenda and Design Initiated Change Order).

Quantity Estimate

A list of all items added, deleted, or revised from the original quantity estimate shall be prepared. The list shall specify if the quantity is an increase, decrease, new, or deleted item and shall be broken down by Federal Section.

Cost Estimate

The Engineer's Estimate shall be updated to reflect any changes to the Estimate due to the addendum. For new items, the Designer shall obtain and use the weighted unit prices from the Department's Contract Development/Cost Estimating unit for items where data exists on unit prices. The original estimated unit costs used to prepare the Engineer's Estimate (inflated to current year costs) shall be used for developing costs on items currently listed within the Engineer's Estimate.

Transmittal Memorandum and Addenda Distribution

The Design Project Engineer will prepare the Transmittal Memorandum. The memorandum will be addressed from the appropriate Transportation Principal Engineer to the Transportation Principal Engineer of Contract Development/Cost Estimating. The memorandum shall contain the following information:

* A list of each revised, deleted or new plan sheet(s), and/or special provision(s).
* A narrative detailing all the changes to the Contract.
* Justification for the addendum, including a copy of any letter or memorandum requesting the change, and who requested the change.
* A list of all quantity takeoffs (increase, decrease, or new item with associated quantity broken down by Federal Section).

Attached to the Transmittal Memorandum shall be the estimated increase or decrease in the Engineer's Estimate associated with the addendum. As the Engineer’s Estimate is confidential information, the estimate shall be attached only to the original memorandum and be hand delivered to the Transportation Principal Engineer of Contract Development/Cost Estimating.

The Office of Contract Administration officially distributes the addendum. A copy of the addendum is distributed to all parties who received the original Contract Plans and Specifications.

**CONSTRUCTION**

**Since the Contracts are written on a calendar basis, unless otherwise noted duties during construction are your #1 priority!**

**Main Project Engineer Activities (list may not be complete)**

1. Make plans, specs, addenda and responses to bidder questions available to the Designers

2. Be the point of E-Mail and verbal contact for the Construction Inspector. Verbal communications shall occur between the Project Engineer and the Construction Inspector only, unless:

* The Project Engineer authorizes the Construction Inspector to speak directly to an individual Designer. The Designer will write a telephone log and a copy will be given to the Project Engineer.
* The Construction Inspector requests that the Project Engineer speak directly to the Contractor. The Project Engineer will write a telephone log and a copy will be given to the Construction Inspector only. It is the Construction Inspector’s responsibility to forward the telephone log to the Contractor should they so desire.
* The Construction Inspector requests from the Project Engineer that the Contractor, subcontractor, or material supplier speak directly to the individual Designer on a submittal or other issue. The Designer will write a telephone log and a copy will be given to the Project Engineer. The Project Engineer will send a copy to the Construction Inspector.

3. Be the point of contact for the Consultant Project Engineer, if applicable.

4. Receive all Contractor submittals, create and maintain a submittal log and transmittal letter, and distribute submittals to the individual Designers.

5. Attend construction progress meetings.

6. Advise the Designers of the progress of construction so that the Designers can make individual site visits.

7. Ensure that the appropriate Designers attend construction progress meetings as necessary by requesting that an agenda be provided 7 calendar days before the meetings.

8. Coordinate the completion/preparation the following:

* Submittal reviews
* RFI reviews
* RFC reviews
* Field Design Changes
* Construction Change Orders

Provide copies available to all Designers.

9. Maintain RFI and RFC logs.

10. Provide sample inspection template document to Project Inspector to assist with the Above-Ceiling and Semi-Final Inspection punch-list development. Refer to “SAMPLE: Above Ceiling Checklist – final.docx.”

11. Perform, with the Designers and Engineer, Above-Ceiling and Semi-Final Inspections.”

12. Coordinate review of Closeout Documents and coordinate their distribution to the Owner.

13. Keep the Project Manager informed of all issues, RFI’s, and RFC’s.

**RFI’s**

Designers are responsible to review and respond to Contractor RFI’s when directed to do so by the Project Engineer. RFI’s can be verbal or written. The Designer shall respond to the Project Engineer as soon as possible, but no later than 10 calendar days from receipt of the RFI. The Project Engineer shall be notified as soon as possible if additional information is required from the Contractor to respond to the RFI.

**RFC’s**

Designers are responsible to review and respond to Contractor RFC’s when directed to do so by the Project Engineer. RFC’s shall be written. The Designer shall respond to the Project Engineer as soon as possible, but no later than 21 calendar days from receipt of the RFC. The Project Engineer shall be notified as soon as possible if additional information is required from the Contractor to respond to the RFC.

**Submittal Review**

While it is not Design’s fault if a Contractor does not send in submittals in a timely fashion, it is Design’s responsibility to not become an impediment.  If a Contractor asks for an expedited review (less than 21 calendar days) it should be accommodated unless there is a valid reason as to why it cannot be expedited.

Within 3 days of the Designer’s receipt of a submittal from the Project Engineer, the Designer shall take a cursory look at it.

1. If a *“No Asbestos Certification”* is required but missing, *“Reject”* it immediately without further review.  If the submittal requires Product Data, Shop Drawings, etc., is it all there?  If not, talk to the Project Engineer about a course of action to either hold it or to return it marked *“Revise and Resubmit”* or *“Rejected.”* Note that no other review has been performed.
2. Do multiple Designers need to review the submittal? If so, the Designer who’s specification the submittal is assigned needs to coordinate the other Designer’s review to ensure that the disposition is correct with all required comments included.
3. The Designer shall determine if the submittal needs to be sent for an outside agency review (such as FM Global) in accordance with the Contract.  If it does, coordinate with the Project Engineer to send it out.

Unless there is an outside agency review, the Designers have 21 calendar days to return submittals to the Contractor.  This does not mean the submittal can be held for 18 days and then looked at.  Notwithstanding extenuating circumstances, Designers should target 18 calendar days as a deadline for submittal review.  Any submittal returned late may become the basis of a delay claim by the Contractor.  Targeting 18 days allows the Project Manager time to sign the submittals.

1. The outside agency (FM Global, etc.) review time of 28 calendar days (60 calendar days on older projects) permits them the time they need to review the submittal.  The submittal should be processed as soon as possible after the comments are received.  Designers should be reviewing the submittal concurrently with the outside agency review as opposed to not starting it until the outside agency review is complete.

2. There is a submittal log in ProjectWise that is updated by the Project Engineer.  Please schedule your work accordingly.  Do not wait for a reminder from the Project Engineer that your submittals are almost due.

Submittal reviews need to be thorough and accurate.  Regardless of what the Standard Specifications say, many Contractors and Inspectors believe that a returned submittal supersedes Contract plans and specifications.  While this is not the case, it does create a financial problem if our submittal review was not thorough and accurate and the Contractor has purchased materials that turn out to be wrong.  This could also cause an issue with Contract Time.  Time is Money too. Therefore, Designers need to take the time to thoroughly review each submittal to verify its compliance with the Contract.

1. Perform a thorough administrative review of Part 1 of the related specification.

2. Perform a thorough technical review of Part 2 of the related specification along with all related plans.

* Compare specifically what was asked for with what was submitted. Sometimes this requires looking at manufacturer’s websites. If the submittal is that incomplete, consider returning it to the Contractor as *“Revise and Resubmit.”*
* Are there optional materials/sizes/accessories that need to be noted to be included?
* Did the contractor provide what we ask for, and does what we ask for make sense?
* Do not note specific quantities by number; instead note “Quantity as required by Contract.”
* If the product was sized in the engineering calculations, look through the original project calculations to make sure the schedules and the submitted product data match the calculations.
* Look at the Contract plans during the review, including details and schedules.
* Consider the submitted products in the completed building and consider how the products will be installed during construction throughout the review process.
* Coordinate with other disciplines or utility companies. Is it possible that the final location of the submitted product interferes with other products/structural parts of the building or surrounding utilities?
* Is there coordination required with other disciplines or utilities to install the product properly?
* Some products shall not be “accepted” until others are “accepted.” For example, a mechanical room louver must be sized based on the actual boilers and water heater so the louvers cannot be sized until the equipment is “accepted.”

3. Perform a thorough technical review of each portion of Part 3 of the related specification along with all related plans.

* Verify installation of products.
* Does the location make sense?
* Have all related products for proper installation been included in the submittal?
* If Part 3 includes schedules, verify that submitted products match these schedules, and that the schedules called out in the specification make sense, that nothing is missing, and nothing is extra.
* Check for anything else required in Part 3, such as additional contractor adjustment after the product is installed, or additional coordination with the Engineer.

It may be beneficial to repeat some points of the Contract on the submittal that have been problems on past projects or are unique to DOT projects.

Remember that no Contract changes are permitted alone by the submittal process. If the submittal process requires a Contract change in your opinion, please coordinate with the Project Engineer before completing the submittal review.

During the review process, you may find information in the specifications or on the plans that is not correct for whatever reason. Please make a note of it to fix your specifications for future projects.

The following standard guidelines are offered so that submittal review comments are more consistent. These guidelines may be altered on a project-to-project basis after consultation with the Project Engineer.

1. From 1.20-1.05.02, the Contractor shall “Provide complete submittal packages as multi-page PDF’s (Working Drawings, Shop Drawings, Product Data, Product Samples, and Quality Assurance Submittals, as applicable) for related elements of Project work for a concurrent review of all information. Incomplete submittal packages will be returned to the Contractor without being reviewed.” To clarify the intent:

* If a specification addresses one element of construction (such as roof, siding) and all submittals necessary to review the element of construction are not included, the submittal may be returned as described above.
* If a specification addresses multiple elements of construction (such as pipe, conduit, light fixtures) where the elements of construction are independent, the Contractor is not required to submit all items from the specification in one package. In this case, a comment shall be included for the benefit of the Contractor and of the Engineer stating that *“The Contractor shall submit outstanding information required by specification \_\_\_\_\_\_ in future submittals.”*

2. All submittal review comments shall be directed to the Contractor since the Department only enters into a Contract with the Contractor; not all the subcontractors. It is the Contractor’s responsibility to coordinate pertinent information with all subcontractors. Comments shall start with *“The Contractor shall…”* Submittal comments shall be a contrasting color of a text font and size to minimize the potential that the Contractor or the Engineer misses the comment.

3. One Designer’s Action Stamp located on page 2 of the Submittal Transmittal Form will be adequate for most submittals. If the submittal has multiple dispositions, then more than one box can be checked and notes applied to clarify the product dispositions. Keep in mind that a submittal that can be stamped *“No Exceptions Noted”* and *“Exceptions as Noted”* can be stamped only as *“Exceptions as Noted.”* At the discretion of the Designer multiple stamps may be used and these stamps may be located on specific pages beyond page 2 of the Submittal Transmittal Form.

4. Clarification of Designer’s Action terms:

* Use *“Revise and Resubmit”* only when the submittal package is similar to what is required but requires too many comments to respond *“Exceptions as Noted.”* This disposition would most likely appear on Shop Drawings or Working Drawings.
* Use *“Rejected”* only when the submittal package cannot be made to be *“Exceptions as Noted”* and *“Revise and Resubmit”* would be misleading, as the particular product cannot be resubmitted. This disposition would most likely appear on Product Data.
* Use *“No Action Required”* only when information is redundant or falls outside of Contract requirements. A “No asbestos certification letter” will not be returned *“No Action Required.”*

5. Product Samples will not receive a disposition of *“No Exceptions Noted”* or *“Exceptions as Noted”* before a *“No Exceptions Noted”* or *“Exceptions as Noted”* disposition of the related Product Data.

6. The Designer shall review the Quality Assurance (QA) requirements of the specification to ensure that the submittal complies with referenced standards and certifications, that the installer has provided the necessary installer certifications, etc.

7. When a submittal requires the submission of closeout documents such as Operation and Maintenance Data and Warranties, the following comment shall be included: *“Final approval of this product is dependent upon the receipt and acceptance of the required closeout documents.”*

8. The Contractor and the Designer should be changing the Contract through the submittal process. Changes would be proposed by the Contractor as “Request for Change (RFC)” or by the Designer as a field design change or construction change order.

9. The Designer shall follow the Submittal Work Flow.

10. Before a submittal disposition is *“Rejected”* or *“Revise and Resubmit”* for a second time, discuss the submittal with the Project Engineer to determine if a conference call should be set up to ensure that both parties understand the issues.

11. When in doubt, talk to the Project Engineer.

**Progress Meetings**

Designers are responsible to attend construction progress meetings when directed to do so by the Project Engineer.

**Pre-Installation Meetings**

Project Engineers will invite Designers to the Contractually-required Pre-Installation Meetings. District Construction has asked for Design to be represented. The Designer should review the specification requirements/agenda in advance of the meeting to be prepared to discuss the key points.

**Designer Site Visits**

Designers will make regular site visits during construction to develop a better feel of how projects are constructed. Doing so will allow the Designers to properly address phasing, constructability, and maintenance of Department operations during construction. The knowledge acquired during construction can be applied to the next project in design. Having seen what causes problems in construction, the Designers will know of the need to advise the Contractor via Notice to Contractors of unique construction requirements to ensure that they are not overlooked.

**Continuous Improvement**

Each Designer shall keep a record of all changes that need to be made (corrections, missing details, etc.) to their plans and specifications throughout construction.  Reference RFI’s, RFC’s, field design changes, and change orders by number. All Designers of the same group need to share this information to revise other projects accordingly.

**Post-Construction Critique**

A Post-Construction Critique is mandatory on each in-house-designed project unless the Facilities Design Project Manager determines otherwise. The Project Engineer will schedule this meeting with the Project Construction Inspector after the Semi-Final Inspection. Attendees will representatives of Facilities Design including the Designers, representatives of Construction including the Project Construction Inspector, code officials from Property and Facilities Services, representatives of the modal bureau, and representatives of the building occupants.

The decision to have a Post-Construction Critique on a consultant-designed project is the responsibility of the Transportation Principal Engineer and the Facilities Design Project Manager. If a Post-Construction Critique is to be held on a consultant-designed project, the attendees will include representatives of the consultants along with those noted above.

**As-Builts**

Refer to the “Digital Project Development Manual,” Section 5 As-Built Comments – Final Plans.

**Design Initiated Change Order Preparation and Submittal**

General

After project Award, changes to the Contract shall be issued as a change order. Changes should be prepared by the Designer. Prior to preparing any of the documentation required for the initiation of a construction order, District Construction should be consulted by the initiator on the timeliness of the request. The Design Project Engineer shall provide District Construction with the estimated cost for the revised work required by the change order request. This information is to be used by the District to verify the availability of contingency funds and for the District to prepare a Recommended Project Memorandum if required.

Plans and Specifications Development

Refer to the “Digital Project Development Manual,” Section 4 Contract Plan and Specification Revisions (Addenda and Design Initiated Change Order).

A revised CSI Table of Contents shall be prepared indicating what was added, revised, or deleted, and the change order request associated with the revision. The revised CSI Table of Contents shall be used as a cover sheet for the revised CSI Sections, and shall be cumulative of all change order requests.

Quantity Estimate

A list of all items added, deleted, or revised from the original quantity estimate shall be prepared. The list shall specify if the quantity is an increase, decrease, new, or deleted item and shall be broken down by Federal Section.

Cost Estimate

A cost estimate shall be prepared. For Unit Price items, use the Bid Unit Price for the construction project to estimate cost of the construction order request. For Lump Sum projects, the original estimated unit costs used to prepare the engineer’s estimate (inflated to current year costs), shall be used for developing costs on existing items.

When dealing with unit prices, unit prices may be subject to renegotiation when the quantity, including any previous quantity changes, decreases or increases by more than 25% over the original quantity.

Costs shall also be provided for new items to assist the Engineer in negotiating with the Contractor. For new items where data exists on unit prices, the Designer shall obtain and use the current weighted unit prices from the Department’s Contract Development/Cost Estimating Unit where applicable.

Transmittal Memorandum and Distribution

The Design Project Engineer will prepare the Transmittal Memorandum. The memorandum will be addressed from the appropriate Manager to the appropriate District Engineer. The memorandum shall contain the following information:

* A detailed description of the changes requested and the number and description of the attachments to be transmitted and/or material included with the memorandum. The distribution requirements should be determined by the unit issuing the change order request. The number of attachments required should be obtained from the Engineer.
* Justification for the changes, including a copy of the letter or memorandum requesting the change, if applicable, and who requested the change, including a commitment to provide funding (if necessary). Identify the funding source if known.
* A listing of each new, revised, replaced and/or voided sheet(s).
* A listing of each new, revised, replaced and/or voided and/or special provision(s).
* A list of the changes in the estimated quantities for the project (increase, decrease). The list should also include any item that is new to the project or any item that is deleted as a result of the revised work. Item numbers of items already in the project should be provided. Item numbers for items that are not currently in the contract should be provided if known (for reference only). Mark each new item with an asterisk and provide a note at the bottom of the table defining the asterisk as identifying a new contract item.
* The estimated increase in cost or credit associated with the change order request.
* A statement certifying that “District No. \_\_\_ Construction has confirmed that sufficient construction funds are available for the necessary changes.” The Design Project Engineer shall be responsible for verifying, with the District having jurisdiction over the project, that sufficient funding is available in the contingency fund. If the District indicates that there is not sufficient funding, then a commitment to provide funding shall be obtained prior to issuing the construction order request. The following statement shall be added in lieu of the above, “The responsible fiscal office has indicated that funding will be made available for this construction order.”
* An FHWA concurrence statement is required on all FHWA full oversight projects where the estimated cost of the Construction Order is in excess of $100,000.

**Use of Commuter Parking Lots During Construction**

The use of commuter parking lots during construction for the staging of construction materials, construction trailers, or for contaminated materials is not permitted without the approval of the Office of Intermodal Planning. The Design Project Engineer will coordinate the potential commuter lot use with Mr. David Balzer.