

### **I-08.01 CADD Procedures**

Design and plan preparation for Department construction projects is done with computer-aided design and drafting (CADD) procedures. The CADD Manual presents details on design and drafting procedures utilized by the department. The CADD Manual is available in electronic form on the web at <http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm>, click "Chapter VI: CADD Manual". Parties outside the Department doing design work and plan preparation for NDDOT, should familiarize themselves with the procedures specified in the CADD Manual. The use of Microstation and Geopak systems is mandatory.

### **I-08.02 Reproduction Procedures**

Design sections routinely require copies of plans and documents for field reviews and PS&E inspections. If a nominal number of copies are needed, they are made on the copy machine located in the Design or Bridge Division. If higher numbers of copies are necessary, or if the plans have a large number of sheets, or if special printing methods are necessary, the copies generally are ordered from the Printing Section of the Information Technology Division.

The District offices will sometimes require larger sized prints of project cross sections, etc. These normally are printed on the plotters located in each District office.

### **I-08.03 Final Plans Submittal**

Final plans are typically generated by the Central Office, Districts, or Consultants. The lead divisions for Central Office plans are typically Design Division, Local Government Division, and Bridge Division. Sometimes other Divisions such as Materials and Research, ETS, and Maintenance are the lead.

#### **I-08.03.01 Central Office Plans**

The lead designer is responsible for obtaining all sections of the plans including traffic safety, traffic control, roadway design, structural, etc. The lead designer will coordinate the plan preparation and will be responsible for assembling the final plans.

#### **Original Hard Copy (Central Office)**

The original paper hard copy shall be sealed, signed, and dated by the lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All of the plan sheets shall be sealed, signed, and dated except for cross sections, table of contents, pit plats, quantity sheets, and environmental commitments.

The title sheet of the plans will be sealed, signed, and dated by the respective Program Manager as the overall coordinator. The title sheet of the structural plans will be sealed, signed, and dated by the Bridge Engineer or the Assistant Bridge Engineer as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for strategic projects, or signed by the respective Division Engineer for the OPD Director on non-strategic projects. Strategic plans also need to be signed by the District within the District Review box.

The cross sections for the original hard copy set should:

- Be included with the plans in one volume, if cross section are less than 25 sheets
- Be a separate volume, if cross sections are greater than 25 sheets

The original paper hard copy of the final plans shall be submitted to the Programming Division by the lead designer as outlined below:

1. The lead designer shall 3-hole punch the original hard copy plans, attach them to folders with hardware, include the current Mainframe cost estimate, and place the highway number, beginning reference point, and project number/description sticker labels on the outside of the folders. The lead designer shall request the project number/description label to be made from their respective administrative assistant.
2. The lead designer shall then deliver the original hard copy plan set to Programming Division.
  - If a job is withdrawn from the bid opening, the lead designer will be responsible to obtain the plans back from Programming.
  - If a future bid opening is assigned, the lead designer shall retain the plans. The lead designer shall re-submit the plans to Programming near the time of the future bid opening.
  - If a future bid opening is not assigned, the lead designer shall give the plans to their respective administrative assistant. The administrative assistant shall file the plans with the Records Center. Once a future bid opening is assigned to the plans, the lead designer shall request the plans back from their administrative assistant. The lead designer shall re-submit the plans to Programming near the time of the future bid opening.
3. Programming will deliver the original hard copy plans that are bid to the Records Center to be permanently stored at the NDDOT Central Office.

**Electronic Plans (Central Office)**

In addition to the original paper hard copy, the final plans shall be submitted electronically in the form of a .pdf file. If FHWA has full involvement in the project, an electronic copy of the final plans is submitted to FHWA by the Programming Division. The lead designer shall submit the electronic plans to Programming as follows:

1. When Programming creates the bid opening list, Programming will also create a bid opening folder within **O:\81 Special Projects\DIP PLANS**. The lead designer shall place the electronic plans in **O:\81 Special Projects\DIP PLANS** by creating a “Job # Project #” folder within the existing bid opening folder created by Programming above. The lead designer shall email **-Grp-DOT Bids Addenda** when the electronic plans have been placed in the **O:\81 Special Projects\DIP PLANS** bid opening folder. This will notify Programming and Construction Services that the electronic plans have been submitted. Other Divisions may place documents within the folder such as soil data, SPs, Right-of-Way certifications, Utility certifications, environmental permits and plans, etc...
  - If the bid opening list has not yet been prepared by Programming, a bid opening folder will not exist within **O:\81 Special Projects\DIP PLANS**. The lead designer shall then instead place the electronic plans within **O:\81 Special Projects\DIP PLANS\000 Plans Holding** by creating a “PCN #” folder. If projects are tied, the folder name shall list the parent PCN first, and all tied PCNs after, separating by a coma. This folder will be used as a staging area for information needed to submit plans. The “PCN #” folder may be created by anyone needing to place documents by PCN.
  - If a job is withdrawn from the bid opening, Programming will be responsible to rename the folder to the “PCN #”, and move the folder and all its contents to **O:\81 Special Projects\DIP PLANS\000 Plans Holding**.
  - Once a future bid opening list is prepared by Programming, Programming will create a bid opening folder within **O:\81 Special Projects\DIP PLANS**. The lead designer shall then be responsible to move the “PCN #” folder and all its contents from **O:\81 Special Projects\ DIP PLANS\000 Plans Holding** to the appropriate bid opening folder within **O:\81 Special Projects\DIP PLANS** and rename the “PCN #” folder to the appropriate “Job # Project #”. This will ensure that all the documents move with the project to the new bid opening.
  - Plan changes can be done at any time while the plans are in the folders described above. The designer shall email **-Grp-DOT Bids Addenda** if any plan changes have been done. This will notify Programming and Construction Services that plan changes have been made.

2. When Programming prepares the project for bid opening, Programming will move the “Job # Project #” folder and all its contents from **O:\81 Special Projects\DIP PLANS** to the **O:\81 Special Projects\DIP PLANS-Final**. This folder is read-only access and plan changes cannot be made. If plan changes need to be made by the lead designer after the plans are read-only access, the lead designer needs to contact Programming to determine if the change can be made, or if an addendum will need to be submitted. See Section I-11.01 of this manual for more information on plan addendums.
3. Programming places the electronic plans on the Bid Opening Plans and Proposals website for bidding.

The Electronic Plan Sheet Submittal Checklist shall be completed, signed, and placed in Filenet by the lead designer before the final electronic plans are placed in **O:\81 Special Projects\DIP PLANS**. The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04 of this section.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement below:

This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE- \_\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation.

A copy of the plans may be distributed in two methods:

1. All paper or hard copy reproductions of the plans that are distributed shall contain a reproduction of the seal, signature and date.
2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

#### **Proposal Package and Supplemental Information (Central Office)**

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

1. Proposal Package items: The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the proposal package.

Electronic File	Responsible Party
CATEX	Programming Division
Pit Lists	Programming Division and Materials & Research Division
SP's	ETS and/or Design Division
Permits	ETS Division
SFN 9683Borrow Area Lists with COA's attached	Design Division

2. Supplemental Information items: The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the supplemental information. All file names must have the prefix of the "Project #" and a suffix of "-zz".

Electronic File	Responsible Party	File Name
Design Data*	Design Division	Project # Design Data-zz.pdf
Linear Soils Report	Materials & Research Division	Project # Linear Soils Report-zz.pdf
Borrow Investigation Report	Materials & Research Division	Project # Borrow Investigation Report-zz.pdf
Existing Structure Plans	Bridge Division	Project # Existing Structure Plans-zz.pdf
Utility Conflict Plans	Design Division - Utility Engineer	Project # Utility Conflict Plans-zz.pdf

\*See section 4.7.7 of CADD Manual for additional details.

### **I-08.03.02 District Plans**

The District lead project designer is responsible for obtaining all sections of the plans including traffic safety, traffic control, roadway design, structural, etc. The District lead designer will coordinate the plan preparation and will be responsible for assembling the final plans.

#### **Original Hard Copy (District)**

The original paper hard copy shall be sealed, signed, and dated by the lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All of the plan sheets shall be sealed, signed, and dated except cross sections, table of contents, pit plats, quantity sheets, and environmental commitments.

The title sheet of the plans will be sealed, signed, and dated by the District Engineer or Assistant District Engineer as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for strategic projects, or signed

by the Design Engineer for the OPD Director on non-strategic projects. For Preventive Maintenance projects, the District Engineer will assume responsibility and sign the plans in place of the Design Engineer.

The cross sections for the original hard copy set should:

- Be included with the plans in one volume, if cross section are less than 25 sheets
- Be a separate volume, if cross sections are greater than 25 sheets

The original paper hard copy of the final plans shall be submitted to the Technical Support Contact for review and processing two weeks prior to the plan completion date.

The original paper hard copy final plans are submitted to the Programming Division by the Technical Support Contact. The Technical Support Contact shall follow the lead designer procedures in Section I-08.03.01 above.

**Electronic Plans (District)**

In addition to the original paper hard copy, the final plans shall be submitted electronically in the form of a .pdf file and placed in **O:\81 Special Projects\DIP PLANS\DISTRICT PLANS** by the District designer. The District designer shall email the Technical Support Contact that the electronic plans have been submitted. The Technical Support Contact shall submit the electronic plans to Programming, and follow the lead designer procedures in Section I-08.03.01 above.

The Electronic Plan Sheet Submittal Checklist shall be completed, signed, and placed in Filenet by the District designer before the final electronic plans are submitted to the Technical Support Contact and placed in **O:\81 Special Projects\DIP PLANS\DISTRICT PLANS**. The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement below:

This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation.

A copy of the plans may be distributed in two methods:

1. All paper or hard copy reproductions of the plans that are distributed shall contain a reproduction of the seal, signature and date.
2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

**Proposal Package and Supplemental Information (District)**

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

1. **Proposal Package items:** The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the proposal package. The District is responsible for placing files in the appropriate folder in **O:\81 Special Projects\DIP PLANS\DISTRICT PLANS** where “Technical Support” is listed as the responsible party.

Electronic File	Responsible Party
CATEX	Programming Division
Pit Lists	Programming Division and Materials & Research Division
SP’s	ETS and/or Technical Support
Permits	ETS Division
Borrow Area Lists with COA’s	Technical Support

2. **Supplemental Information items:** The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the supplemental information. All file names must have the prefix of the “Project #” and a suffix of “-zz”. The District is responsible for placing files in the appropriate folder in **O:\81 Special Projects\DIP PLANS\DISTRICT PLANS** where “Technical Support” is listed as the responsible party.

Electronic File	Responsible Party	File Name
Design Data*	Technical Support	Project # Design Data-zz.pdf
Linear Soils Report	Technical Support	Project # Linear Soils Report-zz.pdf
Borrow Investigation Report	Technical Support	Project # Borrow Investigation Report-zz.pdf
Existing Structure Plans	Technical Support	Project # Existing Structure Plans-zz.pdf
Utility Conflict Plans	Design Division	Project # Utility Conflict Plans-zz.pdf

\*See section 4.7.7 of CADD Manual for additional details.

### I-08.03.03 Consultant Plans

The Consultant will coordinate and assemble the final plans. This may require getting sections of the plans that are not included in their contract, such as structure plans or guardrail plans, from the Technical Support Contact and assembling all the sections into one plan set.

**\*Consultant plans must have the Consultant company/firm name located on the Title Sheet of the plans as follows:**

- **Located in the lower right portion of the title sheet, outside of the sheet border.**
- **Title Sheet of plans only, not to be displayed on other plan sheets.**
- **Text of company/firm name to be displayed only, no company logos.**

#### **Original Hard Copy (Consultant)**

The original paper hard copy shall be sealed, signed, and dated by the Consultant lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All plan sheets shall be sealed, signed, and dated by the Consultant except for the cross sections, table of contents, pit plats, quantity sheets, environmental commitments, and plans prepared by the NDDOT.

The title sheet of the plans will be sealed, signed, and dated by the Consultant as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for Local Government Division or strategic projects, or signed by the respective Division Engineer for the OPD Director on non-strategic projects. Strategic plans also need to be signed by the District within the District Review box.

If the plan set contains cross sections the original hard set should:

- Be placed in the plans if less than 25 sheets
- Be a separate volume if greater than 25 sheets

The Consultant shall submit the original paper hard copy final plans to the Technical Support Contact. The original paper hard copy final plans are submitted to the Programming Division by the Technical Support Contact. The Technical Support Contact shall follow the lead designer procedures in Section I-08.03.01 above.

#### **Electronic Plans (Consultant)**

In addition to the original paper hard copy, the Consultant shall submit the final plans electronically to the Technical Support Contact in the form of a .pdf file. The Technical Support Contact shall submit the electronic plans to Programming, and follow the lead designer procedures in Section I-08.03.01 above.

The Electronic Plan Sheet Submittal Checklist shall be completed and signed by the Consultant and sent to the Technical Support Contact with the final electronic plans. The Technical Support

Contact will place the Electronic Plan Sheet Submittal Checklist in filenet. The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement below:

This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation.

A copy of the plans may be distributed in two methods:

1. All paper or hard copy reproductions of the plans that are distributed shall contain a reproduction of the seal, signature and date.
2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

**Proposal Package and Supplemental Information (Consultant)**

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

1. Proposal Package items: The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the proposal package. The Consultant is responsible for supplying the Technical Support contact with files where “Technical Support” is listed as the responsible party.

<b>Electronic File</b>	<b>Responsible Party</b>
CATEX	Programming Division
Pit Lists	Programming Division and Materials & Research Division
SP's	ETS and/or Technical Support
Permits	ETS Division
SFN 9683 Borrow Area Lists with COA's attached	Technical Support

2. Supplemental Information items: The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the supplemental information. All file names must have the prefix of the “Project #” and a suffix of “-zz”. The Consultant is responsible for supplying the Technical Support contact with files where “Technical Support” is listed as the responsible party.

Electronic File	Responsible Party	File Name
Design Data*	Technical Support	Project # Design Data-zz.pdf
Linear Soils Report	Technical Support	Project # Linear Soils Report-zz.pdf
Borrow Investigation Report	Technical Support	Project # Borrow Investigation Report-zz.pdf
Existing Structure Plans	Technical Support	Project # Existing Structure Plans-zz.pdf
Utility Conflict Plans	Technical Support	Project # Utility Conflict Plans-zz.pdf

\*See section 4.7.7 of CADD Manual for additional details for Supplemental Design Data.

#### I-08.04 Electronic Plan Sheet Submittal Checklist

An Electronic Plan Sheet Submittal Checklist is required to ensure consistency with electronic plans. The Electronic Plan Sheet Submittal Checklist is shown in Chapter I, Section 8, Appendix A of the Design Manual (Section I-08 Appendix A), and is also located on the web at <http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm> on the “Reference and Forms” page under the “Miscellaneous Sheets” table.

The Electronic Plan Sheet Submittal Checklist shall be completed and placed in FileNet before the final electronic plans are placed in the proper Bid Opening Folder on the O:\81 Special Projects\DIP PLANS.

The Electronic Plan Sheet Submittal Checklist shall be completed as follows:

- **Designer**

The Designer shall first review the final electronic plan sheets accordingly with the Electronic Plan Sheet Submittal Checklist. The Designer shall check all items on the checklist and sign on the Designer signature line.

- **Supervisor**

After the Designer has completed and signed the checklist, the Designer shall submit the Electronic Plan Sheet Submittal Checklist to their supervisor. The supervisor will then review the final electronic plan sheets accordingly with the Electronic Plan Sheet Submittal Checklist. The supervisor shall check all items on the checklist and sign on the Supervisor signature line.

### **I-08.05 Standard Drawings**

The Standard Drawings are an approved set of drawings showing standard details and materials of construction. The Design Division has the responsibility to monitor and maintain the department's standard drawings. The initiating Division Engineer (either Bridge, Design, or Materials and Research) will approve and sign the standard drawing.

The Standard Drawings<sup>1</sup> are located on the web at: <http://www.dot.nd.gov/manuals/designmanual/designmanual.htm> under Standard Drawings. The standard drawings located on the department's website have the electronic distribution statement as described in section I-08.03 of the Design Manual.

- **Usage in Project Plan Sheets**

A "List of Standard Drawings" which identifies the Standard Drawing number and description shall be placed in the Table of Contents. The designer should utilize the standard drawings from the website or users within the NDDOT can access them from R:\SUPPORT\DESSTD. These standard drawings should be added to the back of the plans prior to submitting the plans to the Programming Division or to the Technical Support Contact.

- **Revisions to Standard Drawings**

Standard Drawing revisions must be approved and signed by the appropriate Division Engineer (either Bridge, Design, or Materials and Research). The Standard Drawings are then updated on the web. The latest revision made to any Standard Drawings is noted in the drawing's title block with a revision date and short description of the revision. All revisions to the Standard Drawings shall be documented in a cover memorandum and stored in FileNet.

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<sup>1</sup> The original hard copy of all standard drawings are sealed, signed and dated by the Design, Bridge, or Materials and Research Engineer, and are stored in the Traffic Safety Section of the Design Division.

### **I-08.06 Electronic Plan Files and Working Files Distribution**

The final electronic plan set is assembled and submitted as described above. Individual electronic plan files and working files shall be created, stored, or submitted as follows:

- **Central Office and District**

Individual electronic plan files and working files used to create and assemble plans shall be created and stored on the NDDOT network R: Drive in the “Project” folder under the folder with the corresponding project number. District plan files that are created and stored outside of the network R: Drive must be copied/moved to the R: Drive no later than when the plans are approved and signed.

- **Consultants**

All individual electronic plan files and working files that are created outside of the NDDOT shall be submitted to the Technical Support Contact on a CD or through the consultant’s designated ftp site. The Technical Support Contact will copy and place the files in the corresponding folders on the network R: Drive of the NDDOT. The CD will be stored in Records and Retention.

### **I-08.07 Plan Files and Retention Policy**

The original signed and sealed plan sheets are sent to the Records Center and microfilmed. When as-built drawings are received from the Districts responsible for constructing the projects, the as-built sheets are microfilmed and incorporated into the plans.