Ohio Department of Transportation

Tiff Submission Procedure – January 18th, 2010

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(All revisions are indicated in Red Text. See document for details.)

Background

Beginning in January of 2006, the Department has examined an alternative solution to using mylar sheets for final plan submissions. In an effort to examine this issue, a committee was formed with members from the Office of Contracts and several Production Offices (Central Office, District 6, District 9, District 11, and District 12). The committee established a series of incremental steps to identify a process where the District Production staff could submit plans via Tiff images in lieu of mylar tracings.

The traditional method of creating and submitting mylar tracings to Central Office is a time consuming and costly process which yields limited benefit. Once the project is sold, the original mylars are returned to the Districts for archiving and storage. The effort, resources, and time invested in producing and processing mylar tracings is no longer as cost effective and efficient compared to other available alternatives such as electronic image documents. The Department invests over $500,000 per year just to produce mylar tracings.

Utilizing existing technology available to in-house design staff and consultants to create image files, it has been recommended to advance the submissions of final plans as TIFF images instead of mylars. The committee evaluated the various image file formats available and the impacts each method would have on the offices involved. After evaluating the current business practice used by Contracts and Estimating to route plans through the letting process, it was determined that TIFF images would provide a seamless transition and not alter the time required to review, edit, and process these documents.

The committee acknowledged Adobe PDF files offer more advanced user features which exceed the abilities of Tiff images, but based on the current process and ease of implementation, Tiff files were selected. As the electronic submission process evolves, including advancements in MicroStation, PDF files will continue to be evaluated and considered for possible future use.

Terminology

Tiff is an acronym for **T**agged **I**mage **F**ile **F**ormat. Tiff is a common format used for exchanging raster (or bitmap) images between various software applications, in particular, programs used for scanning documents. Tiff images can utilize various levels of resolution while supporting color, black and white, or gray-scale imaging. The ability to store image data in a sustained format makes Tiff files a useful approach for advancing electronic file submissions.

Document imaging and document management systems utilize the Tiff file format for scanning and archiving. As the images are created, the files are compressed using Group IV 2D compression. The advantage of Group IV 2D compression is the image is created with optimum resolution and limited file size. With ODOT's high-volume image environment, the use of Group IV 2D compression provides quality images while conserving storage capacity.

Procedure

The process outlined in this document provides step-by-step instruction on creating the tiff images, submitting the files, completing any file revisions (if necessary), and processing addenda (if applicable). To better illustrate this practice, the procedure is categorized into the following sections:

- Initial Submission
  - Review the project scope
  - Create the tiff files
  - Create a check set of plans
  - Copy the files to the Central Office Server
  - Submit the final plan package

- Revisions: Pre-Addenda Phase
  - Edit plan sheets
  - Replace the existing plans sheet(s)
  - Notify the Office of Contracts regarding the change (Lotus Notes Email Group)
- Revisions: Addenda Phase
  - Edit plan sheets
  - Replace the existing plans sheet(s)
  - Notify the Office of Contracts regarding the change (Lotus Notes Email Group)

Initial Submission

1. Review the original scope of services
   a. Review the original scope of service to verify what deliverables (i.e. full size plots, etc) were specified in the scope document.
2. Image Details
   a. The files may be created as scanned images using the Oce (or equivalent) equipment or generated directly from Iplot Organizer.
      1. It is **not recommended** to create tiff images using MicroStation plotting as the file sizes become too large to manage.
      2. **Section 4** provides detailed instruction on how to create the required tiff images for several different conditions.
   b. All plan images for a project (i.e. construction, right-of-way, geotechnical, etc) are required to be the same "physical" size and the same dpi resolution size.
   c. Image Properties
      1. For full-size submittals provide the following tiff files:
         a. Group IV Tiff, 22" x 34"
            i. 200 DPI (minimum)
            ii. 400 DPI (maximum)
            iii. 4400 x 6800 pixels
      2. For half-size submittals provide the following tiff files:
         a. Group IV Tiff, 11" x 17"
         b. 400 DPI (only resolution permitted)
         c. 4400 x 6800 pixels
      3. For letter-size submittals provide the following tiff files:
         a. Group IV Tiff, 8-1/2" x 11"
         b. 400 DPI
         c. 3400 x 4400 pixels
3. File Naming
   i. File names shall conform to the following naming convention
      1. PID - ###.tif
      2. Where "###" references corresponding sheet number
      3. When projects exceed 999 pages, add an additional "#" to account for the fourth digit.
   ii. If existing tiff images need to be renamed, the following File Naming Utility is available:
      1. Server location: \\ctrfs100\cen$
      2. Program Name: **FileRenamer.exe**
   iii. Geotechnical Exploration Sheets: Structure Foundation Exploration Sheets
      1. Structure Foundation Exploration Sheets are considered a separate component of the plans. If a project contains these sheets, the designer attaches the drawings to the back of the plans following the last plan sheet as indicated on the Title Sheet. The Structure Foundation Exploration Sheets **are not** included with the overall sheet count in the plans.

2. If a project contains these sheets per Figure 304-1 of the ODOT CADD Engineering Standards Manual, use the following Tiff naming convention for the Structure Foundation Exploration Sheets **only**:
    a. PID-geo##.tif
    b. Where "##" references corresponding sheet number

4. Create the tiff files
    a. The designer is responsible to generate the required tiff image per the minimum standards provided in this document **regardless** of their software or methodology.
    b. The standard process outlined in this procedure is based on the Bentley Iplot Organizer product. ODOT is standardized on the Bentley platform and employs the Iplot Organizer printing interface to process final plans. The submission procedure outlined in this document includes several references to additional publications (issued by ODOT) related to the set-up and end user routine for the Iplot product.
    c. The following three (3) categories summarize the creation of Tiff files:
        i. Creating Tiff images with Iplot Organizer
            1. Standard and preferred method
        ii. Creating Tiff images without Iplot Organizer
            1. If a designer is **not** using Iplot Organizer to create tiff images, then the designer is responsible to identify alternate options (See 4(e) for details).
        iii. Creating Tiff images using an OCE TDS800 or equivalent
            1. Oce equipment is used within ODOT and the printing industry. Item 4(f) provides suggested methods for creating tiffs using Oce scanning equipment.
    d. Tiff images using Iplot Organizer
        i. If the user is standardized on Iplot Organizer, then the following documents are available for reference:
            1. Raster Offline Driver Setup (Sever Configuration Document)
                a. Step by step instructions on how to use the Bentley Raster Offline Driver to establish print queues enabling raster format files to be created from Iplot and Iplot Organizer.
                b. District IT staff will coordinate this activity for the users.
            2. Tiff Creation – Using MicroStation Iplot Organizer (User Document)
                a. Step by step instructions on how to create tiff images using Iplot Organizer for MicroStation V8.
            3. Tiff Creation – Using MicroStation Iplot (User Document)
                a. Step by step instructions on how to create Tiff images using MicroStation (V8) Iplot.
        ii. Technical Assistance: DoIT will provide the Districts with on-site assistance regarding the configuration and set up of Iplot Organizer.
            1. If required, contact Jack Kerstetter
                a. Email: Jack.Kerstetter@dot.state.oh.us
                b. Phone: 614-644-5183
    e. Tiff images without Iplot Organizer
        i. If the user is not using Iplot Organizer, then the following options are available:
            1. Print paper copies and scan the documents
            2. Create PDF files and extract Tiff image(s)
                a. Consider a third party software solution which creates a tiff image (per the recommended guidelines) directly from a PDF file.

f. Tiff images using an OCE TDS800 (or equivalent)
    i. The following options are available using the Oce equipment:
        1. Scan paper documents to create a tiff image.
        2. Create HPGL2 plot files to process tiff images (using the Oce Repro Desk interface)
    ii. Scanning option
        1. If a user is scanning paper documents to create tiff files, the following documentation is available for reference:
            a. Tiff Creation – Oce Scanning Document (User Document)
                i. Step by step instructions on how to create Tiff images using an Oce scanner.
    iii. Plot files option
        1. If a user is creating plot files to process tiff files, the following outline is provided for reference:
            a. OCE TDS800 (or equivalent)
                i. Create HPGL2 files
                ii. Send the files to the Oce Repro Desk digital job preparation software
                iii. Submit HPGL2 files to a tiff print queue
                iv. Establish naming convention per tiff guidelines
                v. Process tiff images

5. Create a check set of plans
    a. Optional:
        i. Projects **less than 400** sheets
            1. At the District's discretion, create one (1) full size paper check set of plans from the tiff images. This is suggested to verify the tiff images print correctly and that no visual deficiencies are present (i.e. scale, resolution, quality, etc).
    b. Required:
        i. Projects **greater than 400** sheets
            1. Create ten (10) random test images five (5) working days before the project is submitted to Central Office for a quality review.
            2. Notify Tina Collins when the images are ready for review
                a. Email: Tina.Collins@dot.state.oh.us
6. Copy the tiff files to the Central Office server
    a. \\CTRFS100\D01$ (Each District has their own share. For example, D01$, D02$)
    b. Place the tiff images in the following folder:
        i. \\CTRFS100\D01$
            1. Plans
                a. CTY-PID
    c. A separate tiff image folder is provided for each District and Central Office as referenced above. Only the District has write access to their corresponding project folder with the exception of common folder, \\CTRFS100\TEMP$. All Districts can write and access the common folder.
7. Submit the final plan package
    a. Projects **less than 400** sheets
        i. If a project is less than 400 plan sheets, and the District is able, it would be preferred to submit the tiff images at least one day early; if not, then submitting the tiff images per the Ellis File Date is still acceptable.

b. Projects **greater than 400** sheets
    i. If a project is greater than 400 plan sheets, it is required to submit the tiff images at least **one full working day** early. The one working day suggestion provides the Office of Contracts adequate lead time to print the required paper copies.
c. Title sheet
    i. Scan a copy of the District signed title sheet and place the image on the Central Office Server.
    ii. Contracts will print the scanned image and forward the document to the ODOT Director for final signature.
    iii. After the ODOT Director signs the title sheet, the revised sheet will be scanned replacing the previous version.
d. Notify the Office of Contracts
    i. Notify the Office of Contracts using the following Lotus Notes Email List:
        1. Cen.Contracts.PlanSubmittal
    ii. Once notified, the Office of Contracts (Reproduction) will produce three (3) sets of paper prints and deliver the copies to the Office of Estimating.
e. Plan package submittal form
    i. Submit the final plan package in accordance with the Plan Package Submittal Form per the Office of Contracts, Attn: Debra Neal-Harris.
    ii. http://intranet.dot.state.oh.us/estimating/PlanPackages/PlansSubForm.doc
f. Record set of plans
    i. The record set of plans will be the electronic tiff files stored on the Central Office server.
    ii. The server location is provided below:
        1. \\itcpl100\planimgs

Pre-Addenda Phase – Replacing Sheets

During the Pre-Addenda phase if a plan sheet requires replacement, proceed as directed below:

1. Verify the Pre-Addenda Phase
    a. The Pre-Addenda Phase is defined as the time frame up to the **"Estimate Completed"** date per the Construction Contract Milestone Date Report provided by the Office of Estimating. The report is available on-line through the following web page:
        i. http://portal.dot.state.oh.us/Divisions/Construction/estimating/default.aspx
            1. Listed Under the "Milestone Dates" Category by Year.
        ii. Access the report to confirm your Estimated Completed date.
    b. Any changes beginning on the Estimated Completed date and beyond will require an addendum.
2. Correct the plan sheet as required
    a. If a plan sheet requires revision, the Office of Estimating will notify the District via email explaining the correction.
    b. The Office of Estimating **will not** make the plan revisions.
    c. The District will be responsible to make the necessary correction(s) and resubmit the file per Step 2 as indicated below.
3. Replace the existing plan sheet(s)
    a. Replace the existing sheet(s) on the Central Office server as listed under the "Initial Submission" with the revised document. Replace the file "in-kind" with the same file name as originally submitted (**DO NOT RENAME THE FILE)**.

b. The Central Office file location will keep the current plan sheets until the Office of Estimating assigns a project number. Once the project number is assigned, the project will enter a "lock-down" phase where file updates will not be permitted. If a change is required once the project number is assigned and the project is advertised, then the Project Manager will have to issue a formal addendum to the project.

4. Place a copy of the red-line edits / mark-up plan on the server
    a. Place the mark up copy in the SAME folder as the plan sheets
    b. Name the file using the following naming convention
        i. "MarkUp_month/date/year_###"
            1. Where "###" = corresponding plan page number
            2. Example:
                a. MarkUp_04042007_004.tif
5. Notify the Office of Contracts regarding the changes
    a. After the electronic plan sheet is replaced, email the changes to the following Lotus Notes email list:
        i. Cen.Contracts.PlanSubmittal
        ii. The list includes the following individuals:
            1. Tina Collins
            2. Steve Trendy
            3. Debra Neal-Harris
            4. Tony Palka

Addenda Phase – Replacing Sheets

Note: The existing Addenda Procedure established by the Office of Contracts **remains unchanged** and is not altered as a result of the tiff submissions. The following items pertain only to the plan sheet revision(s) and not the formal Addenda Procedure.

During the Addenda phase, if a plan sheet requires replacement, proceed as follows:

1. Verify the Addenda Phase
    a. The Addenda Phase officially begins per the **"Estimate Completed"** date as defined in the Construction Contract Milestone Date Report provided by the Office of Estimating. The report is available on-line through the following web page:
        i. http://portal.dot.state.oh.us/Divisions/Construction/estimating/default.aspx
            1. Listed Under the "Milestone Dates" Category by Year.
        ii. Access the report to confirm your Estimated Completed date.
    b. Any changes from this date forward will require an addendum.
2. Correct the plan sheet as required
    a. If a plan sheet requires revision, the Office of Estimating will notify the District via email explaining the correction.
    b. The Office of Estimating **will not** make the plan revisions.
    c. The District will be responsible to make the necessary correction(s) and resubmit the file per Step 2 as indicated below.
3. Replace the existing plan sheet(s)
    a. Once the project is advertised the existing plan files will be deleted from the "Plans" folder. The only location where the files can be updated will be in the "Addenda" folder.
    b. Replace the existing sheet(s) on the Central Office server as listed under the "Addenda" folder with the revised document. Replace the file "in-kind" with the same file name as originally submitted **(DO NOT RENAME THE FILE)**.
    c. Use the same District location that we are using for plans:
        i. \\CTRFS100\D01$
            1. Addenda
                a. CTY-PID

4. Place a copy of the red-line edits / mark-up plan on the server
    a. Place the mark up copy in the "Addenda" folder.
    b. Name the file using the following naming convention.
        iii. "MarkUp_month/date/year_###"
            1. Where "###" = corresponding plan page number
            2. Example:
                a. MarkUp_04042007_004.tif
5. Notify the Office of Contracts regarding the changes
    a. After the electronic plan sheet is replaced, email the changes to the following Lotus Notes email contacts:
        i. prebid@dot.state.oh.us
            1. Gary Angles
        ii. Cen.Contracts.Addenda
            1. The list includes the following individuals:
                a. Tina Collins
                b. Tony Palka
                c. Brian Moore

Plan Package Submission

Designers must create and submit the plan package submittal documentation in electronic format as a single PDF file. The following process outlines the steps required to create, name, and submit the plan package documents electronically:

1. Verify the plan package documents
    a. Review the plan package submittal documentation for accuracy and completeness prior to creating the electronic file
    b. All original documentation will remain at the District (i.e. Right of Way Certification Form and Environmental Consultant Form).
2. Create an Adobe PDF file
    a. Assemble the submission documents into one (1) PDF file
3. Name the file
    a. File names shall conform to the following naming convention
        i. PID - PlanPackage.pdf
        ii. Where PID references the Project ID
4. Copy the PDF file to the Central Office server
    a. \\CTRFS100\D01$ (Each District has their own share. For example, D01$, D02$)
    b. Place the PDF file in the following folder:
        i. \\CTRFS100\D01$
            1. Plans
                a. CTY-PID
5. Notify the Office of Contracts
    a. After the PDF file is placed on the Central Office Server, email the following Lotus Notes email list:
        i. Cen.Contracts.PlanSubmittal
    b. At the Project Manager's discretion, designers can indicate the plan package submittal document has been placed on the Central Office Server in the same email notifying Contracts when the Tiff images are available.
6. Plan Logging (Ellis)
    a. Upon receipt of the plan package submittal package, Reproduction will print one (1) copy of the plan package submittal document and deliver it to Debra Neal-Harris. Debra will notify the district of any issues with the submission and log the project into Ellis.