CHAPTER 1: TITLE SHEET and GENERAL LAYOUT

AREA OF ENVIRONMENTAL SENSITIVITY

It is important to show the areas of environmental sensitivity in the plan to make sure these areas are not impacted. These locations must be shown on the general layout sheets. It is recommended to also show them on the removal and construction plan sheets as well.

BRIDGE & APPROACH PLANS

There evidently is still some understandable confusion on when bridge approach work should be included in the bridge plan and when a separate road plan should be prepared.

When bridge work is planned and there is work to be done outside the bridge structure limits, that work is to be placed into a separate road plan. This includes but is not limited to guardrail, signing, traffic control, striping, drainage, lighting, pavement, etc.

If a separate road plan is required the designer needs to request a SP number from the District Artemis Program Coordinator. The road plan is then developed as a normal plan with its own sheet numbering, title sheet, estimate, tabulations, etc.

If no work is planned outside the bridge structure limits a separate plan will not be required. When only a traffic control plan has been developed for a bridge, then these sheets should be given to bridge and they will be numbered into their plans. If striping, signing, or lighting is needed only on the bridge, those sheets can also be incorporated into the bridge plan.

CONSTRUCTION PLAN FOR….

The description of work should reflect any major work such as alternate bid: alternate bituminous or concrete surfacing, grading, bituminous and/or concrete surfacing, ultrathin bonded wearing course, CPR, full depth reclamation, box culverts, ADA improvements, retaining walls, noise walls, bridges, signals, lighting, TMS, etc. Sidewalks, drainage, turn lanes, widening, utilities, etc. should not be included in the title. The only time that signing, striping, guardrail, erosion control, drainage, etc. should be in the title would be when that is the only work being done.

Examples would be:

“Construction Plan for Grading, Bituminous Surfacing and Signals”.

“Construction Plan for Signing”

EXCEPTIONS

There has been some confusion on when an area should be shown as an exception and how to show it.

A project typically runs from point A to point B along a specified alignment. Sometimes there are gaps where no work is being done. These gaps are typically considered an EXCEPTION if they are over 50 feet long. For example there is a 2 mile long overlay section but there is a 500 foot section where no work is being done. If in the 500 foot gap there is only…

Striping then it is NOT considered an exception.

Signing then it IS considered an exception.

Culvert then it is NOT considered an exception.

Guardrail then it is NOT considered an exception.

Sometimes a standalone project does not run along a continuous line but rather is sporadic as in a signal or culvert project. In these cases no length is stated in the length block, and no exceptions are listed. Rather the index map will show each location with a reference point.

Exception limits should be shown in the plan, as a minimum, on the index map, general layout, and construction plan views.

EXCEPTION CLARIFICATION

There has been some confusion lately on when/if a bridge is an exception. A bridge is NOT an exception if there are bridge sheets either in the plan or submitted separately to be advertised with the plan. This typically requires a bridge sub-contractor to perform the work.

When there is work on the bridge such as guardrail or striping only, the bridge would be considered an exception as it does do not require a bridge contractor to perform this work.

When the work is primarily off the roadway such as high tension cable, signing, snow fence, landscaping, etc. and it skips the bridge. The bridge would NOT be shown as an exception.

A box culvert is not considered a bridge when it comes to the length block and/or exceptions.

GOVERNING SPECIFICATIONS

All plans let after December 30, 2017 will be using the 2018 Spec Book. The Governing Specifications in the top right corner of these plans should state…

The 2018 Edition of the Minnesota Department of Transportation "Standard Specifications for Construction" shall govern.

For the few plans that get an exception to use the 2016 Spec Book should read…

The 2016 Edition of the Minnesota Department of Transportation "Standard Specifications for Construction" shall govern.

INDEX MAP

There are frequent cases when even a magnifying glass is of little benefit when viewing a title sheet index map. The particular problem in mind and a way to resolve it, is well stated in the Technical Manual, Article 5-292.606 A1: "*Judgment should be exercised regarding the project map size. In many cases the maps are too small in scale, while on others, too much area not related to the project is shown. By limiting the project map to the project itself and adjacent area, larger scale maps can often be utilized"*. Be sure to label major roadways and cities to assist in finding the project locations.

The project limits should be labelled with a begin and end SP number and stationing and include all bridge numbers/locations.

In those cases where the work is in a certain location as in an intersection then the project could be circled and labelled as "Project Location" with the SP # , reference point, and stationing.

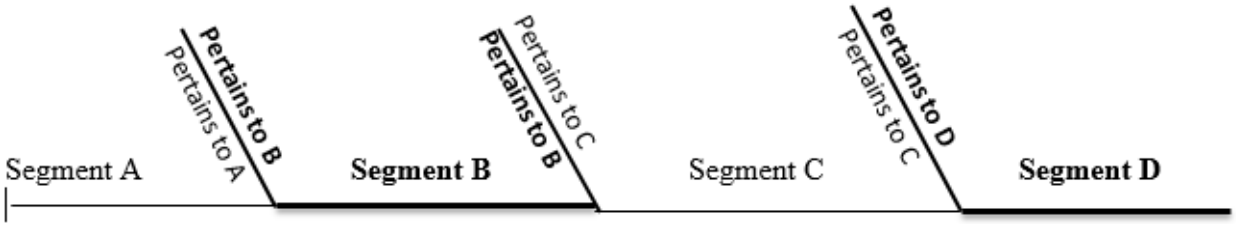
LEADER LINES

There has been some confusion regarding what side of a leader line the information should be written on.

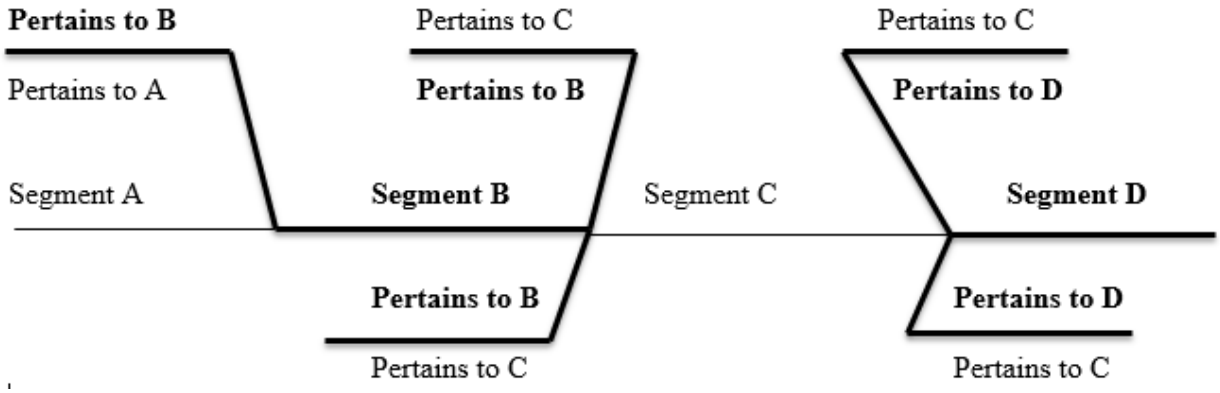
The information placed on the leader line should reference the side of the leader line that it applies to. Sometimes this may appear awkward but if you imagine the leader line as a dividing line it divides the information on either segment of the roadway.

The begin, end of an SP number and/or an exception needs to be on the correct side of the leader line. The stationing and roadway name is not as critical as it typically pertains to both sides of the leader line.

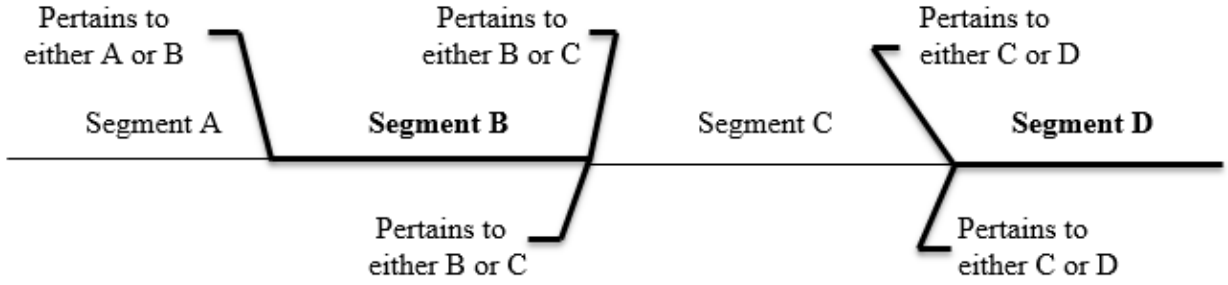
The following diagram explains it in simpler terms….



A more complicated example would be…



If you are still confused by this you might think about not using the horizontal line at all as the following example shows….



LENGTH BLOCKS

Each plan should contain a length block for each SP number. The length block should include the SP number and if more than one roadway applies then the TH should also be listed with the SP in parenthesis.

If the roadway is divided it should include a note which states…THE PROJECT LENGTH AND DESCRIPTION IS BASED ON XX ROADWAY ALIGNMENT OR ROADWAY.

The Gross length should be calculated using the stationing (including the equation lengths) not the reference points as these are not always true miles. If stationing is not available then reference points can be used to determine the lengths for the length block.

It should also include all bridge lengths on the project. This does NOT include culverts. If a divided roadway it would only be the bridges on the alignment or roadway stated above.

It should include the exception length, if any. If a bridge is an exception then it should be included in both the bridge length AND the exception length.

The net length should be the difference between the gross length and the exception.

The beginning and ending reference points also need to be included at the end of the length block.

In some cases a standalone project does not run along a continuous line but rather is sporadic as in a landscaping, signals, lighting, signing, traffic management system and traffic control plans. These plans may NOT require a length block to be filled in with lengths. But at a minimum the length block should only contain the begin and end reference points.

LOCATED ON….

The description of the project location should reflect the beginning and ending location of the project. This should include the TH number, a cross road or water feature name of where the project begins and where the project ends. The referenced location should be shown on the index map. If there is more than one TH then more than one line of information should be included. It should not use reference points, bridge numbers, or city limits/names as location descriptions.

It is recommended that the city/county are shown on the index map. If they are shown on the index map then they not need to be included in the located on section.

PARTICIPATION PROJECTS

On projects where there is participation with municipalities (city, county, etc.) and different funding. The "General Layout" would be a good place to show where the splits occur if they don't show up on the title sheet. In addition the tabulations & estimate are to show the splits.

See Chapter 18 of the Design Scene…"MUNICIPAL AGREEMENTS FOR STATE LET PROJECTS" for more information.

PROJECT CONTACTS FOR BIDDERS

Previous plan convention suggests designers include their name and telephone number on the title sheet of the Plan. There is concern regarding bidders contacting several different sources to obtain project information during the time plans and proposals are on sale, prior to the letting date.

The District should provide the name and number of the Resident Engineer in the special provisions for bidders to contact. The designers' name, excluding telephone number, should be listed on the title sheet.

DO NOT place any names, phone numbers, and/or websites in the plan! The SWPPP sheets are the only exception to this.

PROJECT NUMBERS

The Prime S.P. number will now be shown on the Project Submittal Memo.

For many years MnDOT has used the Low S.P. number method to identify projects. But this sometimes resulted in the Low S.P. changing with the addition or deletion of work. Therefore, this method (Prime S.P. number) will replace the past method of Low S.P. number.

Selection of the Prime S.P. number should be based on the purpose and need for the project, the main reason why this project is being undertaken. The selection of the Prime S. P. number should be based primarily on the segment of roadway most likely to remain as part of the project in case adjustments become necessary to the project termini. The Prime S.P. number is most likely to be the identifier that will show as the Letting project.

Any other S.P. numbers that are part of the overall project are identified as Associated S.P. numbers.

Project numbers should be left to a minimum on a construction plan. Designers should review their design work authorities to see if any can be dropped. Any time we have at least 2 with the same control section (such as S.P. 4911-xx) for a proposed contract, all but the low SP should be dropped. For example you have on the plan SP 4911-01, SP 4911-02, and SP 4911-03. Use only SP 4911-01 to cover all the areas for control section 4911. Construction and future record keeping for the project will be simplified.

Occasionally there are projects that are district-wide or state-wide in nature. These projects can still occur and the S.P. number used to identify them will be considered the Prime S.P. number.

If you do not know what your Prime S.P. number is you should contact your PUMA (Project Unification Management Application) Coordinator for assistance.

A frequent question on plan sheets is the need for T.H. number for identity purposes. The T.H. number, followed by the primary statutory route number, (T.H. 94=392) should only be shown in the bottom right corner on the title sheet. The T.H. number, (T.H. 94) is required in the lower right hand corner on all the other plan sheets, behind the S.P. number. This simply identifies the sheet better.

When there are multiple SP's be consistent and use, at a minimum, the prime SP and TH on every sheet. You can list all SP's and TH as long as you are consistent throughout the plan.

When there is more than one SP on the title sheet the entire T.H. number, followed by the primary statutory route number, (T.H. 94=392) should be shown for all SP's even if the TH and Legislative numbers are the same.

Sometimes there are multiple Legislative Routes on the same roadway. These can change over the course of a route and over time. When in doubt use the statutory route number that represents the greatest extent of the highway route or the lower number.

REFERENCE POST LOCATIONS ON CONSTRUCTION PLANS

For a number of years now, some designers have been tying our road plan stationing to reference posts on the title sheets with the length of projects tabulations. The terms "Milepoint" and mile post are outdated and are now called Reference Points and Reference Posts.

The green numbered Reference Posts are set on the roadway shoulder from road stationing and are used by Road Inventory, Traffic Engineering, Accident Data, Pavement Management, Soils and Preliminary Engineering. These Reference Posts are approximately 1 mile apart (but can be more or less than a mile apart) and allow a person to relate physical roadway features to plan or

highway stationing. Our present trunk highway system has an established Reference Post system. Once set, a Reference Post stays at the same station for the life of that highway alignment. On divided highways, Reference Posts are set on the northbound or eastbound alignment, with another post at right angles on the other roadbed.

Reference points are based on reference posts. They are used to locate features between reference posts. A reference point has the format of PPP+xx.xxx where PPP is the number of the previous post and the +xx.xxx is the distance past the post to the feature of interest. If that distance becomes greater than a mile before the next post is reached, the "+" part of the reference point looks like this "+01.xxx" and so on. A reference point exactly at a reference post (e.g. mile marker post 104) would be shown as 104+00.000 do not write it as 104.000 as that can lead to confusion on whether it is a reference point or a true mile point.

This type of referencing allows for a maximum of 99.999 miles between posts. The last digit has an accuracy of 5.28 ft.. Measurements are made in an increasing route mileage direction Reference Posts. For example, Reference Point 104+00.231. This

Reference Point represents a point that is 0.231 miles past post number 104 (or 0.231 x 5280' = 1219.68 feet past post 104). Whenever Reference Posts are used, they should be prefixed with Reference Post, (R.P.) To prevent confusion with alignment data. In other words, Reference Post 104 is shown as: R.P. 104 = Sta. 327 + 78. Roadway stationing is shown to an even foot.

The method utilized a set of numbered reference posts (also called "mile posts") that are physically placed along a roadway. The first post (post 0) is not usually placed along the roadway but is assumed to exist at the beginning of the route. The remaining posts are numbered consecutively and are usually placed one mile apart. Any point along a roadway can be located by providing (1) a reference post number, (2) the distance from that reference post, and (3) an indication of the direction from the reference post.

Examples:

200 + 00.000 a location exactly at reference post 200.

350 + 00.500 a location half a mile from reference post 350. The location is half a mile beyond post 350 (towards the end of the route).

423 + 00.250 a location a quarter mile beyond reference post 423.

All plans should be tied to Reference Posts in addition to the traditional stationing information. The beginning and ending Reference Points shall be shown on the title sheet within the length block at a minimum and all the Reference Posts locations shall be shown on the general layout or plan sheets.

Stationing of Reference Points will be assigned by the Transportation Data & Analysis Office.

On existing alignment, submit the beginning and ending stationing and the length of project. On new alignment, send a copy of alignment including stationing of corporate limits, public road, crossings and county lines. The Transportation Data & Analysis Office will make the calculations and return the Reference Points with stationing to the designer within a couple of weeks.

In the near future, we hope to update 5-292.608 in the Technical Manual to account for these Reference Posts and Reference Points.

ROADWAY PROJECT MAPPING APPLICATION (RPMA)

The Roadway Project Mapping Application (RPMA) references a frozen subset of Linear Referencing System (LRS), which is the Highway Performance Monitoring System (HPMS) data that is sent to FHWA on an annual basis.

RPMA must be used to determine the begin and end reference points of a project. The log point listing and Videolog use the old, frozen TIS data from 2014 and should no longer be used. By using these systems there is the risk of corrupting data, and the project location data could be inaccurate.

RPMA is based on a straight horizontal line and does not take into account hills and valleys as the old systems did. Therefore, the reference point values could be substantially different.

RPMA is only accessible internally. Therefore, outside users will need to contact their MnDOT project manager for assistance with this.

RPMA can be found at MnDOT A to Z…go to "Roadway Data"…go to "Roadway Project Mapping Application (RPMA)…go to "Launch Roadway Project Mapping Application".

RPMA versus FIELD MARKERS

Since the start of using the Roadway Project Mapping Application (RPMA) in our plans there have been some cases where RPMA does not agree with where the reference posts are in the field.

This is because RPMA is based on a straight horizontal line and does not take into account hills and valleys as the old systems did. Therefore, the reference point values as shown in the field could be substantially different than those shown in RPMA. How do you handle this in the plan as it could be confusing for contractors using it in the field?

If they disagree the designer needs to request a RACER update the RPMA information. To do this go MnDOT A to Z under RACER and click on "application". This will place it in the LRS which will be updated into RPMA every 18-20 months. Until it is updated you may use it in the plan as long as the RACER request has been made.

There has also been confusion regarding what to use for the title sheet. Use the reference points shown as ###+00.### not the carto miles.

STATIONING VS REFERENCE POINT

There has been some confusion on when to use stationing and reference points. Every project requires reference points to be shown on the title sheet length block. When using reference points they need to be written in the standard format of XXX+XX.XXX.

If stationing is available it should be used throughout the plan. If stationing is not available then reference points can be used to help define the project limits and locations of the work within the plan.

If desired both stationing and reference points may be used to define the project. However the plan views and tabulated charts should be consistent to either show all as reference points or stationing.

STIP AMENDMENTS

Designers need to check that the work and limits outlined on the plan match the STIP. The STIP may be updated periodically throughout the course of the year for project additions, advancements, changes in scope, cost, and other types of changes. These changes are accomplished either by a Formal STIP Amendment or an Administrative STIP Modification. Every effort should be made to keep Formal STIP Amendments and Administrative STIP Modifications to a minimum.

For guidance on the type of amendment and the process please check out the STIP Guidance website at….

STIP Amendment Guidance

TITLE SHEET ACCESS

The title sheets can be accessed on a computer with microstation by the following address:

Internal = ProjectWise Standard Drawings

These files includes both English title sheets for Process A and Process B plans as well as State Aid and Building Removals.

TITLE SHEET MATERIAL

From this day forward do NOT use Mylar for title sheets. It has been determined that is not an acceptable material for editing. Therefore, use Vellum for all title sheets as it has shown that it can be edited if necessary.

TITLE SHEET SIGNATURE BLOCK

Each District is responsible for reviewing their final plans prior to submittal to the Pre Letting Services Section. The title sheet shall be signed as recommending for approval by the District Materials Engineer, District Traffic Engineer and District Hydraulics Engineer when these functional groups have provided input to the design. If they have not provided input they do not need to sign the plan. In these cases remove their signature block.

ALL title sheet signatures must be wet (original) signatures and cannot be computer generated (electronic).

For a consultant designed plan (State Letting): the District Materials, Hydraulics or Traffic Engineer shall review and sign the plan before C.O. functional group review.

For agreement plans (let by others - not designed by MnDOT): The plan will go through the C.O. functional group review.

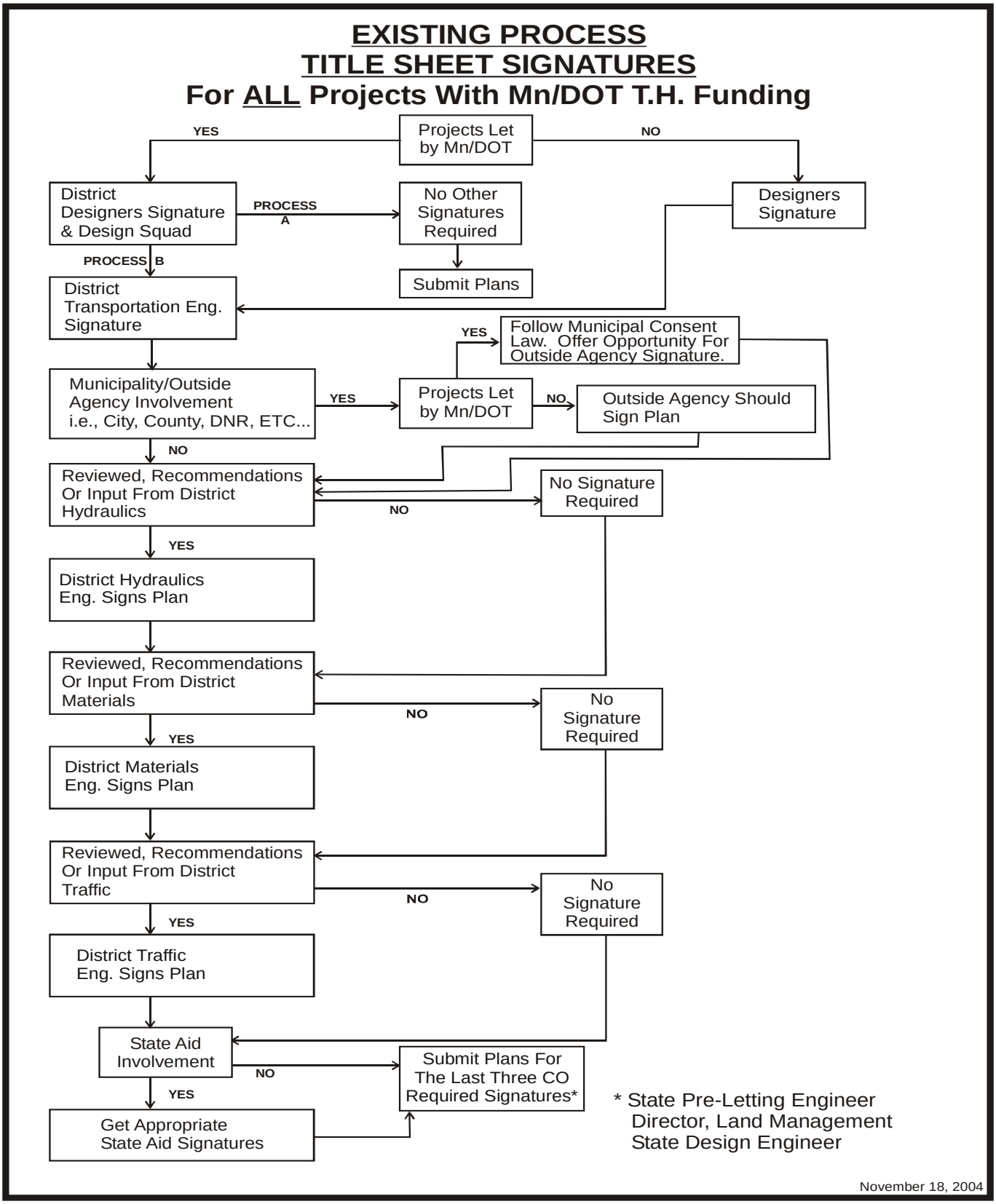
For cooperative plans (State letting): If other work is inserted into our plan, it is understood we are approving the work on MnDOT right-of-way.

For plans that have, for instance, no hydraulic considerations, their signature area can be removed.

Even though designers are required to sign every sheet in the plan, the signing of the title sheet is still required. There are several examples of title sheets with signature blocks in the system (see article above "TITLE SHEET ACCESS"). There is also one showing a state aid signature block.

The design engineers signature must include his/her printed name as required by the Minnesota Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience and Interior Design (AELSLAGID). An example can be found at… Minnesota Licensure Board Stamps and Seals

See following flow chart for the signature process for all projects:


EXISTING PROCESS
TITLE SHEET SIGNATURES
For ALL Projects With Mn/DOT T.H. Funding
Projects Let by Mn/DOT
YES
NO
District Designers Signature & Design Squad
PROCESS A
No Other Signatures Required
Designers Signature
PROCESS B
Submit Plans
District Transportation Eng. Signature
YES
Follow Municipal Consent Law. Offer Opportunity For Outside Agency Signature.
Municipality/Outside Agency Involvement i.e., City, County, DNR, ETC...
YES
Projects Let by Mn/DOT
NO
Outside Agency Should Sign Plan
NO
Reviewed, Recommendations Or Input From District Hydraulics
No Signature Required
NO
YES
District Hydraulics Eng. Signs Plan
Reviewed, Recommendations Or Input From District Materials
NO
No Signature Required
YES
District Materials Eng. Signs Plan
Reviewed, Recommendations Or Input From District Traffic
NO
No Signature Required
YES
District Traffic Eng. Signs Plan
State Aid Involvement
NO
Submit Plans For The Last Three CO Required Signatures*
YES
Get Appropriate State Aid Signatures
* State Pre-Letting Engineer
Director, Land Management
State Design Engineer
November 18, 2004

SP18-P.CDR(1)

TRIBAL LANDS

It is strongly encouraged that, if applicable, all federally recognized tribal land boundaries be identified in the plan. As a minimum these should be shown on the general layout sheets if applicable. If there are no general layout sheets then show the boundaries on the title sheet index map. This will assist in providing direction for MnDOT policy, procedures, and requirements when working on or near tribal lands and assists in being mindful of issues of tribal sovereignty and jurisdiction. More information can be found at MnDOT A to Z, "Tribes and Transportation" and "Tribal Lands" websites.

WHEN DO YOU NEED ANOTHER SP

With the new federal requirements we can no longer let side work within ½ mile be part of the original SP. Therefore, whenever work is being done on a separate control section, even if it is less than ½ mile, it will probably require a separate SP number.

There are rare exceptions to this so if the designer believes theirs is a rare case they need to verify with the Project Design Services Engineer to be sure.