

Minnesota Public Drainage Manual

Chapter 3 – IV. Engineering and Environmental Considerations - Detailed survey and engineer's final report

Summary

After the DNR issue a commissioner's preliminary advisory report, the drainage authority will conduct a hearing on the engineer's preliminary report and review the commissioner's preliminary advisory report. If the project is not dismissed, the county or joint board drainage authority will order the engineer to make a detailed survey with plans and specifications for the proposed drainage project. (**See Section IV, A**).

There are two basic purposes of a detailed survey:

- To collect such additional information as is needed to address problems raised during the preliminary hearing, to modify the preliminary plan as directed by the drainage authority, or to evaluate and address concerns raised by the commissioner's preliminary advisory report, and
- To obtain additional detailed information necessary for the staking and construction of the project;

The required elements of a detailed survey are described in **Section IV, B**.

The engineer's final report should essentially include all the information incorporated in the engineer's preliminary report, any additional information obtained during the detailed survey, and the extra items require in [Minn. Stat. § 103E.285](#). Details for engineer's final report are provided in **Section IV, C**.

Following the engineer's final report, the DNR Commissioner is required to issue a final advisory report which makes findings as to whether the engineer's final report is adequate and whether the proposed drainage project is of public benefit or utility under the environmental and land use criteria. (**See Section IV, D**)

A. General

The engineer must consider several factors when determining the relative scope of the preliminary and final surveys. If insufficient detail is taken during the preliminary survey, much of the previous work may be retraced during the final survey, resulting in extra costs. However, if the preliminary survey is too detailed, much of the work will not be utilized if substantial project changes are made during the hearing process. Likewise, regulatory and reviewing agencies may request additional field data during the preliminary survey stage. It is recommended that the preliminary survey be made as complete as possible, meaning that the work is completed close to the standards demanded during the final survey. It is the responsibility of the engineer to select the appropriate level of detail at the preliminary survey stage to provide accurate estimates of the proposed project's cost, to meet the needs of reviewing agencies, and at the same time minimize surveying costs of the project.

Note: Caution must be exercised during the preliminary survey to ensure that costs do not exceed the petitioner's surety bond. As the preliminary survey becomes more detailed in nature, the engineer must keep the petitioners' attorney and the drainage authority informed about

cumulative costs - including an estimate of costs yet to be incurred. Additional surety bonds may need to be provided as work progresses.

After the engineer's preliminary report has been filed with the drainage authority (as required by [Minn. Stat. § 103E.251](#) or [Minn. Stat. § 103D.711](#)) the DNR will issue a commissioner's preliminary advisory report to the drainage authority as outlined above.

The drainage authority will conduct a hearing on the engineer's preliminary report. The commissioner's preliminary advisory report is reviewed at that hearing and public testimony is taken. Provided that the project is not dismissed, the county or joint board drainage authority will order 'the engineer to make a detailed survey with plans and specifications for the proposed drainage project and submit a detailed survey report to the drainage authority as soon as possible." [Minn. Stat. § 103E.265](#). No further reports are required for a watershed drainage authority.

B. Detailed Survey

There are two basic purposes of a detailed survey:

- To collect such additional information as is needed to address problems raised during the preliminary hearing, to modify the preliminary plan as directed by the drainage authority, or to evaluate and address concerns raised by the commissioner's preliminary advisory report; and
- To obtain additional detailed information necessary for the staking and construction of the project.

The elements of and procedures for the detailed survey are outlined in [Minn. Stat. § 103E.271](#). The engineer's efforts related to the detailed survey culminates in the production of plans and specifications and a detailed survey report to the drainage authority.

[Minn. Stat. § 103E.271 Subd. 2](#) specifies the requirements for the detailed survey: all drainage lines are to be surveyed at 100 foot and stations and elevations must be referenced to standard sea level datum, if practical. However, in using the terminology "if practical," Drainage Law implies that there is latitude for the engineer to exercise professional judgment and experience in establishing the level of the detailed survey. This may include taking cross sections at intervals greater than 100 feet (i.e., 200 feet) if the topography is flat and unchanging, or utilizing other sources of topographic data (e.g. LiDAR) for preparing portions of the survey. Deviations should be noted with sufficient rationale to provide justification for the drainage record.

From the standpoint of project construction, sufficient detail must be provided so that the contractor can bid on and construct the project with minimal ambiguity. In addition, a system of benchmarks for both vertical and horizontal control must be established along the project alignment at no greater than one mile intervals for future construction staking convenience. These construction-related tasks are most easily accomplished during the final survey.

Sometimes a project alignment or outlet is significantly changed during the preliminary hearing. Realignment may also come about due to right-of-way problems, mitigation of potential damage to wetlands, or for other reasons. Changes made in the project during the preliminary hearing often result in a substantial additional work during the final survey.

During the final survey, the engineer is given flexibility in deviating from the alignment decreed in the preliminary hearing, if necessary, to drain property likely to be assessed into the proposed drainage project. Such changes may include:

- Additional ditches and/or tile that are necessary;
- Outlet extensions; or
- Additional outlets.

Additional concerns relative to the detailed survey need to be addressed at this time. It is highly likely that the final survey will become part of the permanent record of the proceedings for years to come. Original survey notes and the drawings prepared from them will become permanent records if the project is constructed. Therefore, the engineer must be sure that the survey work is accurate and of high quality. Benchmark locations should be shown on the plans, and their description and elevations should be tabulated. A final design water surface profile and ditch and tile gradelines, reflecting all changes, should be shown as part of the final profile drawings. The engineer shall revise the detailed survey report by applying as-built information to the original drawings. (See **Section XII** of this manual and [Minn. Stat. § 103E.295](#)).

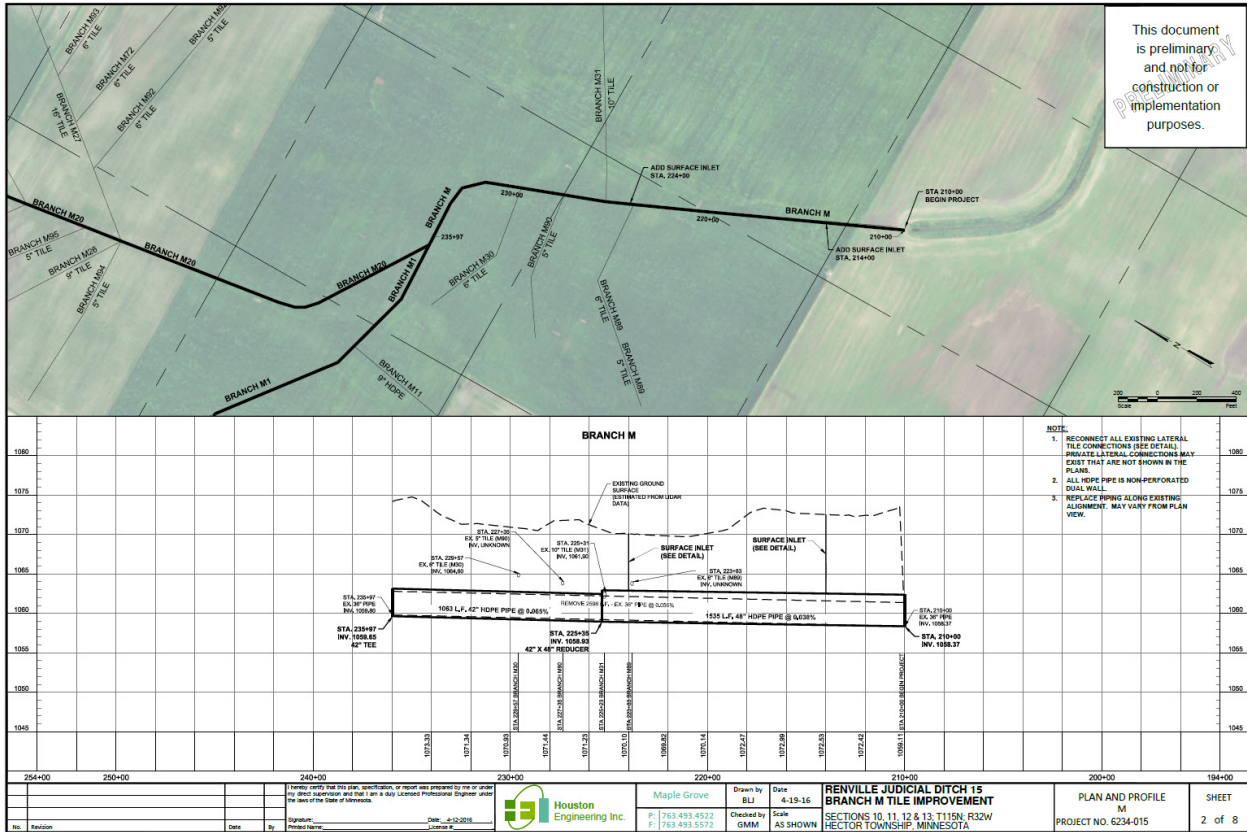
C. Engineer's Final Report

The drainage code is specific regarding the minimum contents of the engineer's final report (see [Minn. Stat. § 103E.285](#)). The engineer's final report should essentially include all the information incorporated in the engineer's preliminary report, any additional information obtained during the detailed survey, and the extra items required in [Minn. Stat. § 103E.285](#). In addition, it is recommended that the engineer's detailed survey report should consider recommendations contained in the commissioner's preliminary advisory report and preliminary hearing testimony, and the likely conditions of any required permits for the project.

The engineer's final report needs to be complete and thoroughly address all remaining items. This report establishes much of the public record for the decision to order the project. It will be filed with the drainage authority, and then submitted to the DNR for a second review. The DNR then files a final advisory report with the drainage authority. Information may need to be extracted from the report for future litigation, drainage system maintenance or repair, or improvements.

Since the engineer's final report is a modification and extension of the engineer's preliminary report, it may follow the same basic format.

Examples of engineer's final reports can be found in **Appendix 14**.



D. Advisory Review of Detailed Survey Report

[Minn. Stat. § 103E.301](#) gives the DNR two primary tasks during the review of the engineer's final report. First, the commissioner's final advisory report must make findings as to whether the engineer's final report is adequate. During its review, the DNR should try to answer the following questions:

- Is the detailed survey report complete and in accordance with the provisions of chapter 103E?
- Is the detailed survey report an acceptable plan to drain the property affected?
- Is the proposed drainage project of public benefit or utility under the environmental, land use, and multipurpose water management criteria in section [Minn. Stat. § 103E.015, subdivision 1](#)?
- Is a soil survey needed?
- Has the engineer fully evaluated the adequacy of the outlet?

If the answer to all of the above questions is yes, then the commissioner's final advisory report should state that the engineer's final report is adequate.

The commissioner's final advisory report includes a finding as to whether the proposed drainage project is of public benefit or utility under the environmental and land use criteria. The commissioner's final advisory report may find the engineer's final report is adequate yet also recommend that the drainage authority not proceed with the proposed project as planned. In this instance, the commissioner will have found that the public costs identified by the engineer (e.g., destruction of wildlife habitat, increased flooding downstream, etc.) exceed the public and private benefits of the proposed project.

As with the preliminary report, the final engineer's report must be submitted to BWSR if the drainage authority is also a watershed district. The nature of this review and advisory report is nearly identical to that of the preliminary report.