DESIGN SCENE

OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT PROJECT DESIGN SERVICES UNIT

July 2014– Page 1

Chapter Headings

By: Y. Crocker

To clear up some confusion the Design Scene chapter headings will be revised as follows….

Chapter 1….TITLE SHEET and GENERAL LAYOUT
Chapter 2…QUANTITIES and TABULATIONS
Chapter 4….EARTHWORK and SOILS & CONSTRUCTION NOTES
Chapter 6…STAGING and BYPASS
Chapter 8…INPLACE TOPOGRAPHY and REMOVALS
Chapter 18 …GENERAL NOTES and MISCELLANEOUS

These will change in the index, the Design Scene/Sample Plan Cross Reference, and the chapters themselves.

Chapter 1 – Project & Legislative Numbers *(revised section)*

By: Y. Crocker with assistance from Peter Morey & Jeffrey Saholt

This section is revised to read as follows:

For many years Mn/DOT has used the Low S.P. number method to identify the project. Any other S.P. numbers that are part of the overall project are identified as Associated S.P. numbers. The new method (Prime S.P. number) will replace the current method of Low S.P. number as stated in Technical Memorandum No. 10-01-SCE-01.

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, as 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.

Chapter 2 – Maintenance and Restoration of Haul Roads *(revised section)*
By: Y. Crocker with assistance from Paul Johns

Replace this section with the following….

The pay item 2051.501 "Maintenance and Restoration of Haul Roads" Lump Sum should be used on all projects that require raw materials to be hauled to or from the job site. Such as projects that include, but are not limited to, Borrow items, Bituminous materials, Concrete materials.

Stand-alone projects such as crack repairs, landscaping, striping, guardrail would not need the pay item in the SEQ.

Chapter 5 –Utilities *(revised section)*
By: Mollie Zauner

Chapter 5 has been replaced with the following….

General Information
Experience shows that proactive utility coordination early in the design of a project minimizes the amount of effort needed later in the design life and during construction. It also helps the state avoid costly unexpected problems and claims. Mn/DOT has developed a 14-step utility coordination process that emphasizes communication among all parties involved. This process is outlined in detail in the Mn/DOT *Utilities Manual*, which is available online at http://www.dot.state.mn.us/utility/projectdelivery.html .

Many federal and state laws, rules, and regulations govern how the state handles utilities on its projects. They are listed below.

- Federal Laws
  - 23 USC 109(I)
  - 23 USC 123
- Federal Regulations
  - Part 645 of title 23 of Code of Federal Regulations
- Federal Guidelines
  - *Program Guide: Utility Adjustments and Accommodations on Federal Aid Highway Projects*, Sixth Edition, January 2003, FHWA-IF-03-014
  - *Highway/Utility Guide*, June 1993, FHWA-SA-93-049
- Minnesota State Constitution
  - Article 1, section 13
  - Article 14, section 2

- Minnesota Statutes
  - Section 161.20, subdivision 1
  - Section 161.45
  - Section 161.46
  - Section 222.37, subdivision 2
  - Section 216D.04
- Minnesota Rules
  - Parts 8810.3100 through 8810.3600

The "Laws, Rules, and Regulations" section on pages 7 through 9 of the *Utilities Manual* briefly describes each of these items and provides links to the actual documents.

Mn/DOT's 14-Step Utility Coordination Process

A brief overview of the 14-step utility coordination process is described below.

Step 1: Utility Identification

Find utility owners the project may affect by contacting Gopher State One Call and using any other methods available (e.g., historical permits, old plans, etc.). Send the Utility Identification Letters to any utility owners who do not respond.

Step 2: Utility Information Meeting

Send the Utility Information Meeting Letter to the utility owners. Prepare for, hold, and follow up on the Utility Information Meeting. Request information from the utility owners.

Step 3: Review of Information from Utility Owners

Receive and review information that the utility owners provide. Contact them about any errors or inaccuracies.

Step 4: Utility Design Meeting

Send the Utility Design Meeting Letter to the utility owners. Prepare for, hold, and follow up on the Utility Design Meeting.

Step 5: Request for Utility Relocation Plans

Request detailed relocation plans and schedules from the utility owners.

Step 6: Utility Coordination Follow Up

Review the relocation plans and schedules and follow up with the utility owners if there are any questions.

Step 7: Utility Design Change Meeting (optional)

The Utility Design Change Meeting is only necessary when there is a major change to the design of the project that will affect utilities. Prepare for, hold, and follow up on the Utility Design Change Meeting.

Step 8: Gopher State One Call Verification
Contact Gopher State One Call no more than 90 days before plan submittal to see if there have been any changes or additions to existing utilities.

Step 9: Review of Utility Relocation Plan, Schedule, and Permit Submittal
Review the relocation plan, schedule, and permit application with Construction.

Step 10: Reimbursement and Utility Agreements (if necessary)
FYI…The Utility Agreements and Permits Unit performs this step when there are utility agreements on a project.

Step 11: Notice and Order and Utility Relocation Permit
FYI…The Utility Agreements and Permits Unit issues Notice and Orders.

Step 12: Utility Information in Contract Documents
Include all utility information in the request for bids.

Step 13: Construction
Construction coordinates any actual relocation in the field.

Step 14: Payment and Close Out (if necessary)
FYI…The Utility Agreements and Permits Unit handles payments closes out any utility agreements.

Abbreviated Utility Coordination Process
The state requires the districts to use the full, 14-step utility coordination process on all projects, with a few exceptions. Projects that may qualify for the abbreviated process include those that:

- Have a timeframe less than 12 months;
- Are stand-alone bridge replacement, removal, renovation, and repair projects;
- Have no new right of way;
- Are mill and overlay projects;
- Require excavation but the exact location of excavation is determined in the field; and
- Require excavation for work with little latitude for adjustment in the field.

Refer to the "Project Categories for Abbreviated Process Application" on pages 82 through 90 of the *Utilities Manual* for more information about these projects and which steps you can eliminate from the process.

Depicting Utility Facilities on Plans

State law dictates how we must address utilities on our construction plans. If any required utility information is missing, the state is responsible for the costs for any damages to facilities or disruptions of service.

Although it is best to have separate utility sheets, you can include utility information on other plan sheets if necessary. The *Utilities Manual* contains sample utility sheets.

General Requirements

- If there is a petroleum or high-pressure gas line in the vicinity of the project, include a warning note on the title sheet of the plan. (e.g. WARNING! PETROLEUM PIPELINE CROSSING)
- Ensure that the names of the utility owners on the plan sheets are the correct, legal names of those companies or agencies. Refer to UMART or the contact list on the Utilities website, http://www.dot.state.mn.us/utility/contacts.html , for the most current names. Do NOT include contact names, phone numbers and/or e-mail addresses on the plan sheets, but include them in the special provisions.
- Include the utility quality level note:
  The subsurface utility information in this plan is utility quality level ___. This utility quality level was determined according to the guidelines of CI/ASCE 38-02, entitled, "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data." This not must be included in the plan whether utilities are affected or not.
- State whether electric facilities are transmission or distribution. Include the voltages of all power lines that are 69 kV or more.

Utility Tabulations

You must include ALL utility facilities that appear on the plan sheets in the tabulations, and you must include ALL utility facilities that appear in the tabulations on the plan sheets. Do not duplicate facilities in the plan sheets. Do not tab facilities that are too far away to appear on the plan sheets.

A sample of a utility tabulation is shown below.

Station	Location	In-Place Facility	Action			Utility Owner
			Leave As Is	Adjust	Relocate	
1+00 to 2+00	3 ft RT to 10 ft RT	buried telephone	X			CenturyLink
2+00 to 3+00	10 ft RT to 9 ft RT	buried telephone	X			CenturyLink
3+00	9 ft RT	telephone pedestal			X	CenturyLink

If you have a long project but will only affect utilities in specific locations, only show and tab utilities in those specific locations. For example, if you have a ten-mile mill and overlay project with two culvert replacements, provide plan views of the culvert replacements that show the utility facilities and tabulate those facilities. If there are other utility owners that have facilities in the project limits but not in the vicinity of the specific work, include the following statement and list the names of the utility owners:

> The following utility owners have facilities within the limits of the project but will not be affected.

No Affected Utilities

If there are no utility facilities in the project limits, include the utility quality level note and the following sentence:

> There are no utility facilities within the project limits.

If utility facilities are present but the project will not affect them, tabulations are not necessary. In those cases, in addition to the information provided in the *General Requirements* section above, use one of the following notes or something similar in the plan:

- No utilities are affected by this project.
- This project does not include excavation, therefore no utilities will be affected.
- The utilities on this project are located outside the limits of excavation and will not be affected.
-

In addition to one of the statements above, include following language followed by a list of the utility owner names:

- The following utility owners have facilities inside the limits of the project.

Left In-Place Out-of-Service vs. Abandoned

On occasion, utility owners will stop using certain facilities without removing them from the right of way. If you have a project where this is going to happen, make sure you use the correct term to describe the situation. In general, you should use the phrase “Leave In-Place Out-of-Service” for the affected facilities. This language tells the utility owner that it will retain ownership and responsibility, and therefore liability for the facilities. The term “Abandon,” however, turns responsibility and liability of the facilities over to the state.

Utility Locations and Elevations

Show the location of all utility facilities on the plan, profile, and cross section sheets of the plan. Appendix M of the *Utilities Manual* shows the standard symbols to use to represent each facility.

If you do not know the depth of underground facilities, use the following assumptions on the cross-section sheets:

- Telecommunications: 3.0 feet below the surface;

- Gas: 2.5 feet below the surface;
- Electric: 3.5 feet below the surface; and
- Water: 7.5 feet below the surface.

Utility Agreements and Permits Unit (Utilities Unit)

The Utilities Unit must send copies of the plan and Notice and Orders to ALL utility owners that need to adjust or relocate their facilities because of our construction, whether there will be an agreement or not. Utility agreements are only necessary when money is changing hands. The Utilities Engineer makes the final decision about whether utility work is reimbursable, so always check before making promises to utility owners. There are three situations in which the state MAY reimburse utility owners.

- The utility owner must relocate facilities from a location on which it has a property right, such as an easement.
- The relocation meets the requirements of a municipality's first move.
- The project is on interstate right of way.

Agency agreements are receivable agreements that are required when Mn/DOT's contractor will be placing, adjusting, or relocating utilities as part of the construction contract. A bridge attachment is the most common type of work covered by an agency agreement.

Chapter 10 - Diamond Grinding

By: Brett Troyer

A Boiler plate provision is completed for this operation and must be included in the special provisions for these projects. The provision allows for the slurry to be placed within MnDOT Right of Way on vegetated slopes and within the median. This provision lists areas that require the slurry to be collected and disposed of off the Right of Way.

The plans must show federally recognized tribal reservation boundaries. Identification of federally recognized tribal reservation boundaries may be found on the following website: http://mn.gov/indianaffairs/tribes.html.

All Areas of Environmental Sensitivity (AES) must be shown in the plans. Areas of Environmental Sensitivity are as follows:

(1) MnDNR Public Waters Inventory (PWI).
(2) National Wetland Inventory (NWI).
(3) Calcareous fens.
(4) Permanent vegetation designated for preservation, such as areas adjacent to the right of way identified as a 'Site of Biodiversity Significance' or 'Native Plant Community' by the DNR Minnesota Biological Survey (MBS).
(5) Prairie remnants, including but not limited to areas adjacent to Railroad Rights-of-

way Prairies.
(6) Wooded areas with specimen trees.
(7) Locations with Federal or State listed Threatened or Endangered plant species.
(8) Locations with Federal or State listed Threatened or Endangered aquatic species.
(9) Historic properties.

For identification of items 1- 5, the following web link will provide the needed information: http://deli.dnr.state.mn.us/data_search.html

For identification of items 6-9 information and direction will be provided by the Office of Environmental Stewardship (OES) staff through the project's Early Notification Memo (ENM) process.

In addition to the AES locations the following must also be identified on the plans:

(1) Curb and gutter sections that convey storm water to catch basin inlets into a closed drainage system (storm sewers).
(2) Inlet structures that utilize a piping system to convey storm water directly into stormwater treatment ponds or AES.
(3) Bridge deck grinding.
(4) Stormwater treatment ponds.
(5) Infiltration/filtration basins.

If there are little or no opportunities to deposit the slurry in a project area the plans should identify that all the slurry must be picked up and hauled away to a slurry pit or facility that will accept the material.

Chapter 10 – Subgrade Preparation

By: Y. Crocker

In the 2005 Spec Book it stated that…"***Payment for subgrade preparation, as a separate item, will be made only when the roadbed or other course being prepared was constructed under a previous contract."***

The 2014 Materials Lab Supplemental Specifications for Construction book does not contain this language. Therefore, if subgrade preparation is required on your project you either need to note it as "Incidental" or use the pay item …2112 SUBGRADE PREPRARTION.

Chapter 18 – Design Exceptions *(revised section)*
By: Y. Crocker with assistance from Darwin Yasis

Replace this section with the following…

A design exception occurs when a highway project design includes geometric design elements that fail to satisfy criteria set forth as policy by MnDOT and/or the Federal Highway Administration (FHWA). Failure of the design to meet the standard for any of the **13 Critical Design Elements** requires approval of a ***formal design exception***.

It is expected that …
- There will be early coordination
- The design exception does not duly degrade the safety and operational performance of the roadway
- The compatibility with the adjacent roadway segments will be maintained
- The design exception will exercise good design practice and engineering judgment.

The Design Exception submittal package should be sent to the C.O. Geometrics Unit for approval by the State Design Engineer. It should include, but not be limited to…
- A general description of the project background
- An evaluation of the design exception
- An explanation of justification
- Review and approval from…
  - The State Bridge Engineer for bridge related projects
  - The FHWA on Full Federal Oversight Projects

This taken into consideration when determining approval of a design exception include, but are not limited to…
- Consideration of Safety and Operations
- Consideration of Crash History and Roadway Character
- Cost to Attain Full Standard and Impact on Environmental Features
- Degree of Reduction
  - Impact on other Standards
  - Mitigation

A rule of thumb for successful design exception justification is that two conditions are successfully asserted:
1. No reasonable, feasible, and practical solution to provide standard values, OR non-standard value is advantageous in some ways and results in an overall superior design.
2. Use of non-standard values for the elements in question will not be expected to unduly degrade the safety or operational performance of the proposed facility.

Cost by itself is NOT a good justification.
Remember to keep design exception information with the design file.

Chapter 18 – Grammar Tips

By: TJ Melcher

There has been some confusion regarding which words to use in which cases. Therefore, I will attempt to explain this…

affect vs. effect

What's the difference between affect and effect? Well the majority of the time (English is such a funny language), you use affect as a verb and effect as a noun. Affect can be thought of as something that was an influencing action, while effect is known as the result.

- The bridge replacement on Highway 59 near Plummer has affected motorists for three months with its detour.
    - Verb (conveys an action or occurrence): Affected motorists describes the action of what happened.
- The bridge replacement on Highway 59 near Plummer has had an effect on motorists for three months with its detour.
    - Noun (person, place, thing or idea/concept/experience)- Effect on motorists describes the idea/concept/experience of what happened.

So what are those rare instances in which affect can be a noun and effect is a verb? Well, when the influencing nature of affect is an abstract concept it turns into a noun. As in, "Motorists displayed a happy affect after the bridge replacement on Highway 59." Conversely, effect can be a verb when it's used as an action, like "to bring about." "MnDOT hoped to effect change with the bridge replacement on Highway 59."

i.e. vs. e.g.

These two abbreviations are commonly misused by writers and typically folks tend to use i.e. when e.g would be more appropriate, how can you remember the difference? Well first it helps to define them; i.e. is Latin for id est, which means "that is" and is used to further explain something. E.g. is short for exempli gratia, which means "for example," and is used when you are giving an example to help illustrate your point. An easy way to remember the difference is to visualize that i.e. means "in essence" and e.g. stands for eg zample (example).

- I need fifty-two folding protractors (i.e., like the ones we bought last year).
- Insert literary elements (e.g., alliteration, similes, metaphors) to make your writing more

interesting.

To further define the differences think of it this way. Use i.e. (in essence) to specifically clarify what you're actually talking about: MnDOT received extra funding (i.e., Corridors of Commerce) to improve safety along the Highway 2 corridor and intersections.

On the other hand, e.g. allows you to introduce a few examples to help emphasize your point, but it isn't a finite list of all possibilities. It's just a few examples: MnDOT receives extra funding (e.g., HSIP, CIMS) to improve safety along corridors and intersections.