

MONTANA DEPARTMENT OF TRANSPORTATION

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# ROAD DESIGN MANUAL

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## **Chapter 14**

### Specifications/Special Provisions/Detailed Drawings

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# Chapter 14

## Specifications/Special Provisions/Detailed Drawings

Chapter 12 presents Montana Department of Transportation's (MDT) procedures for the preparation of construction plans. In addition, contractors, material suppliers, and MDT personnel assigned to supervise and inspect construction use the *Standard Specifications for Road and Bridge Construction (Standard Specifications)*, Special Provisions and the *MDT Detailed Drawings* to assist them in the project design and construction. The Montana Public Works Specifications may also be used, particularly for urban projects and projects involving water lines and sanitary sewers. Chapter 14 describes the purpose of the Specifications, Special Provisions and Detailed Drawings. Chapter 14 also presents the guidelines for preparing Special Provisions.

The current *Standard Specifications*, Standard Special Provisions, and *MDT Detailed Drawings* are all available on the MDT Website. Links to these documents are provided below.

### 14.1 GENERAL INFORMATION

#### 14.1.1 Hierarchy of Importance

The *Standard Specifications*, *MDT Detailed Drawings*, Special Provisions, and construction plans are all essential parts of the contract. They are intended to complement each other and are used to describe and provide complete instructions for the work to be accomplished. If a discrepancy does exist between these documents, the following presents the hierarchy of importance among them:

1. "Question and Answer Forum" Information

2. Special Provisions
3. Table of Contractor Submittals
4. Plans
5. *Standard Specifications*
6. *MDT Detailed Drawings*

### 14.1.2 “Question and Answer Forum” Information

This is a forum for Contractors to submit questions they have about the advertised Contract Package that can be seen by all plan and specifications holders. MDT’s “Question and Answer Forum” can be found at the following link on the MDT Website:

[MDT “Question and Answer Forum”](#)

### 14.1.3 Special Provisions

Special Provisions are additions or revisions to the *Standard Specifications* setting forth conditions and requirements for a special situation on a particular project. Special Provisions are included in the contract documents for a specific project, and are not intended for general use. The design team prepares them for inclusion into the project documents. The Special Provision should also include the appropriate section number from the *Standard Specifications* (e.g., COLD MILLING [411]). Note that the section number is in brackets rather than parentheses. Section 14.2 discusses guidelines for preparing Special Provisions.

Standard Special Provisions are Special Provisions that are commonly applicable to many projects. The Engineering Construction Contracting Section (ECCS) has compiled a list of Standard Special Provisions for road and bridge items. This list is routinely updated and can be obtained from ECCS. The design team is responsible for calling out the number and title of the Standard Special Provisions that apply to road design items (e.g., No. 401-10 Fog Seal). Standard Special Provisions that require modification will have an “m” located after the date of initiation or revision. (e.g., 108-14 Sequence of Operations Revised 5-5-03 m). The design team should not send the text of the Standard Special Provision unless it contains revisions. The revisions should be highlighted. The design team must ensure that they are applicable for the particular project before their inclusion in the contract document. MDT’s Standard Special Provisions can be found at the following link on the MDT Website:

[MDT Standard Special Provisions](#)

### 14.1.4 Table of Contractor Submittals

The Table of Contractor Submittals is a Special Provision that provides directions to the contractor on the required submittals for approval throughout the execution of the contract. The table may not be all-inclusive and does not include submittals required by other Special Provisions. All submittals required by the contract, including those not listed in the table, are to be provided by the

contractor. If a discrepancy exists, submittals required by other Special Provisions in the contract take precedence over the Table of Contractor Submittals.

Additional information regarding the Table of Contractor Submittals can be found in the MDT Specifications Book and at the following link on the MDT Website:

[MDT Table of Contract Submittals](#)

## 14.1.5 Specifications

### 14.1.5.1 Standard Specifications for Road and Bridge Construction

The *Standard Specifications for Road and Bridge Construction* (*Standard Specifications*) are standards adopted by MDT for work methods and materials that are used for construction. The *Standard Specifications* are part of all construction contracts. They provide MDT's criteria for:

1. Bidding,
2. Awarding of the contract,
3. The contractor's duties,
4. Controlling the material quality,
5. The contractor and MDT's legal requirements,
6. Executing the contract, and
7. Measuring and paying for contract items.

The *Standard Specifications* are published in pdf form and are typically updated every six months.

A Standard Specification Revision Form must be submitted for all proposed changes to the *Standard Specifications* and addressed to the Construction Engineering Services Bureau for evaluation and action. If changes are approved they become Standard Specifications.

MDT *Standard Specifications* can be found at the following link on the MDT Website:

[MDT Standard Specifications](#)

## 14.1.6 MDT Detailed Drawings

The *MDT Detailed Drawings* provide details on various design elements that are consistent from project to project (e.g., guardrail, fencing, drainage details). They provide information on how to layout or construct the various design elements. *MDT Detailed Drawings* are provided at the following link on the MDT Website:

[MDT Detailed Drawings](#)

All proposed changes to the *MDT Detailed Drawings* must be addressed to the Construction Engineering Services Bureau for evaluation and action. Any

changes to the detailed drawings that are approved are included in the next round of changes.

Note that the first three numbers of the detailed drawing number are coordinated with the *Standard Specifications*. For example, Detailed Drawing No. 606-05 “Metal Guardrail” is referenced to Section 606 “Guardrail, Median Barrier Rail and Guide Post” in the *Standard Specifications*.

Users can download and review the drawings on the MDT Intranet or MDT Internet Web page (Contractor’s System). However, the design team will be unable to make changes to these files. In addition, all drawings are available on MDT’s Computer-Aided Design and Drafting (CADD) system. These CADD files can be copied and modified to make project specific details as necessary to be included in the plans.

## 14.2 SPECIAL PROVISION PREPARATION

Special Provisions are required whenever a project contains work, material, sequence of operations, or any other requirements that are necessary for the completion of the project, but are not “described completely” in the construction plans, *Standard Specifications* or the *MDT Detailed Drawings*. The term “described completely” should be interpreted to mean that the prospective bidder will be able to clearly understand the work to be accomplished, type of materials or equipment required, construction methods or details to be used, how the item of work will be measured, and the basis of payment. A Special Provision is also required for any experimental feature included with a project.

An overview of MDT’s experimental features process is provided on the MDT website at the following link:

[Experimental Projects Overview](#)

The following sections provide guidelines for preparing Special Provisions.

### 14.2.1 Preparation Steps

Do not prepare Special Provisions using the “cut-and-paste” method. Instead, the design team should use the following steps when preparing a Special Provision:

1. **Define Need.** Review existing specifications, detailed drawings or construction plans to ensure that there is a need for the Special Provision. If the topic is not adequately covered in one of the other contract documents, only then should a Special Provision be prepared.
2. **Research.** Research the topic so that complete and detailed information is available before writing the Special Provision. This may require contacting manufacturers, contractors, or suppliers for the latest information. Local conditions and problems should also be fully investigated.
3. **Format.** Prepare Special Provisions in the same manner as the *Standard Specifications*. Section 14.2.2 presents the format that should be used.

4. **Type.** Analyze the type of construction to be covered in the Special Provision to determine the type of Special Provision to be used. There are two basic ways to present Special Provisions: by materials and methods, and by performance presentation. The *materials or methods* presentation describes the procedure or materials that should be used to construct the element. The *performance* presentation describes the end result of construction; the types of procedures and materials to achieve the end result are at the contractor's discretion. Only use one or the other form of presentation. When applicable, the performance presentation is preferred over the material or method presentation.
5. **Develop Outline.** The outline should cover the basic requirements of the work to be completed or the materials to be used. It should define the essential physical characteristics of the material or work (e.g., dimensional limitations, time, strength, weight, size, shape, configuration). Organize all relevant factors under each appropriate heading.
6. **Writing the Special Provision.** Once the outline has been developed and all research has been completed, the first draft can then be prepared. The design team may want to review existing Special Provisions for guidance. The following presents several grammatical recommendations for preparing Special Provisions:
  - a. **Wordings.** Write the Special Provision in the active voice (sentence begins with a verb) and the imperative mood (sentence expresses a command).
    - i. **Active Voice:** For example, "apply rubbed finish to the exposed surface."
    - ii. **Passive Voice:** For example, "rubbed finish shall be applied to the exposed surface."
  - b. **Sentences.** Prepare the Special Provision using simple language and words. Keep words and sentences short (20 words or less), unless complexity is unavoidable.
  - c. **Paragraphs.** Limit paragraphs to three to four sentences.
  - d. **Terminology.** Words should be used consistent with the bid items and their exact meaning. Use the same word throughout; do not use synonyms. Avoid any words that have a dual meaning. Section 14.2.4 presents the recommended terminology that should be used. Omit extraneous words and phrases.
  - e. **Will.** The term "will" is only used to describe actions to be performed by MDT.
  - f. **Pronouns.** Avoid the use of pronouns, even if this results in frequent repetition of nouns.
  - g. **Punctuation.** Carefully consider punctuation using the minimum number of punctuation marks consistent with the precise meaning of the language. Ensure that there can be no doubt on the meaning of any sentence.

- h. **Parentheses.** Avoid the use of parentheses (). Instead, use commas or rewrite the sentence.
  - i. **Numbers.** It is usually unnecessary to write numbers both in words and figures. Write numbers less than or equal to ten as words. Write numbers higher than ten numerically. When writing dimensions, use fractions (e.g.,  $\frac{1}{2}$ ",  $\frac{1}{8}$ ") and/or numerals (e.g., 0.20', 10.00', 1.7 gallons). Do not write 2" x 4"; instead, write 2" by 4". Times and dates should be written numerically. Decimals less than one should be preceded by the zero, such as "0.02".
7. **Reviewing.** Review previously completed paragraphs as succeeding ones take shape. Where necessary, redraft preceding paragraphs to reflect later thoughts.

The design team should prepare and distribute the preliminary draft of the Special Provisions for review and comment at the Plan-in-Hand review. The design team will be responsible for incorporating the review comments into the final draft. The final draft will also be distributed for comment at the final plan review.

8. **Coordination.** The design team should coordinate with other units to ensure that Special Provisions are not duplicated (e.g., "Detour" or "Traffic Control and Sequence of Operations" written by both the Bridge Bureau and the Road Design Section). Where this occurs, combine the information into a single Special Provision that meets the needs of the project.
9. **Presentation.** Present Special Provisions as follows:
- a. Type Special Provisions specific to a project in MS-Word format. Type Standard Special Provisions that are modified in the Word format with the changes in bold type. When modifying a Standard Special Provision, other than addition to active field information, delete the revision date from the title.
  - b. Identify Standard Special Provisions that are used without modification by their title and number. Identify only those Special Provisions that apply to road design items.

### 14.2.2 Format

Prepare Special Provisions in the active voice and in the same format as the *Standard Specifications*. The sections of the Special Provision that should be addressed include:

- 1. **Description.** Describe the work to be performed, with references to specifications, plans or other Special Provisions that further define the work. Where necessary or desirable for clarity, describe the relationship of this work item to other work items or other phases of construction.
- 2. **Materials and/or Equipment.** Designate the materials and/or equipment to be used in the work item and establish its requirements. Delineate complete specifications of the properties of each material and the method of tests. References may be made to American Association of State Highway and Transportation Officials (AASHTO), American Society for Testing and Materials (ASTM), or other recognized specifications.



3. **Construction Details.** Describe the sequence of construction operations or the desired end product. Do not mix the two types of presentations as described in Section 14.2.1. Where practical, use the performance presentation. This will permit the contractor to use improved equipment, as well as new and advanced ideas in construction methods. Only use the presentation for the sequence of construction operations if it is critical to achieving the desired result. Specify quality control and quality assurance requirements, and specify who is responsible for testing.
4. **Method of Measurement.** Describe the components of the completed work item that will be measured for payment, the units of measurement and whether measured in original position, in transporting vehicles or in the completed work. Designate any modifying factors and other requirements needed to establish a definite, measured unit (e.g., disturbed or undisturbed, temperature, and waste).
5. **Basis of Payment.** Describe the units for which payment will be made, and define the scope of work covered by such payment. Ensure consistency with the bid items.

### 14.2.3 Guidelines

In addition to Sections 14.2.1 and 14.2.2, the following presents several guidelines the design team should consider when developing Special Provisions:

1. **Completeness.** When developing the Special Provision, ensure that the essentials have been included and that each requirement is definitive and complete. The Special Provision should not be vague.
2. **Consistency.** Ensure the Special Provision is consistent with other documents of the contract.
  - a. Use consistent names for bid items when discussing materials. Do not use multiple terms to discuss one item.
  - b. Refer to definitions and terms in the Standard Specifications to ensure consistent use of common terms.
3. **Clarity.** To ensure the Special Provision is clearly presented, review the following:
  - a. Clearly delineate the method of measurement and payment.
  - b. When referencing MDT in general, use Project Manager. When a specific point of contact is required, use the appropriate title or specific name and include contact phone number.
  - c. Make a clear, concise analysis of the job requirements for general conditions, types of construction and quality of work. Do not leave the contractor in doubt on what will be required.
  - d. Give directions, never suggestions.
  - e. Never assume the Project Manager or contractor “knows” what is meant.
  - f. Do not use phrases such as “as approved by the Project Manager,” “at the discretion of the Project Manager,” or “as directed by the

Project Manager” in place of definite work requirements. Such phrases may lead to confusion or misunderstanding. Avoid conflicting or ambiguous requirements. Every specification should have only one meaning.

- g. Never conceal difficulties or hazards from the contractor.
4. **Conciseness.** Write each Special Provision as concise as practical. When reviewing the Special Provision, consider the following suggestions:
- a. Avoid duplications between the Special Provision and any related contract documents. When referencing Specifications, refer only to the appropriate Section number, do not identify the subsection.
  - b. Do not give reasons for a Special Provision requirement.
  - c. Do not provide additional information that is unnecessary for the preparation of bids and the accomplishment of the work.
  - d. Once stated, do not repeat any instruction, requirement, direction or information given elsewhere in the contract documents.
  - e. Do not include mandatory provisions that are required in general by the contract.
  - f. Minimize the use of cross references.
5. **Correctness.** To ensure that the Special Provision is written correctly, review the following:
- a. Where practical, independently cross-check every factual statement.
  - b. Do not include items that cannot be required or enforced.
  - c. Ensure that the Special Provision does not punish the contractor or supplier.
  - d. Ensure that the Special Provision does not unintentionally exclude an acceptable product, construction method or any equipment. If suppliers/products are specified in the provision, include the phrase “or approved equal”. When feasible, it is better to list specific material property requirements rather than identifying proprietary methods/materials that meet those requirements.
  - e. Ensure that the provision does not change the basic design of the item.
  - f. Do not specify impossibilities. The practical limits of workers and materials must be known and recognized.
  - g. Specify standard sizes and patterns wherever practical.
  - h. Avoid personal whims.
  - i. Ensure that the contractor will not be held responsible for the possible inaccuracy of information furnished by MDT.
  - j. Ensure that sufficient attention has been provided to assessing the durability or reliability of the material or procedure discussed. The use of permanent and recognized standards should be quoted to ensure that the specified performance or characteristics are achieved. If not, the testing criteria should be completely and accurately defined.

- k. Make a careful, critical examination of manufacturers' or trade associations' recommendations, and require supporting evidence before adopting them.
- l. Keep requirements stringent. A strong requirement can be relaxed more economically, when the need arises. Weak specifications cannot be strengthened without increasing cost and generating claims.
- m. Ensure that the provision gives directions that are consistent with the standard practice currently used by MDT.

#### 14.2.4 Terminology

1. **Abbreviations.** Generally, avoid abbreviations. However, they may be used if they are defined and the definitions are consistent with the accepted meanings.
2. **Amount, quantity.** Use "amount" when writing about money only. When writing about measures of volume, such as cubic yards, use "quantity."
3. **And/or.** Avoid using "and/or"; instead, use "and" alone, or "or" alone, or "or ... or both." For example, "Unless otherwise specified by the plans or Special Provisions or both,...".
4. **Any, all.** The word "any" implies a choice and may cause confusion. Use the term "all" in place of "any." For example, "Correct all defects."
5. **As per.** Do not use "as per"; instead, use "as stated," "as shown," "conforming to," or other similar phrases.
6. **At the contractor's expense.** Do not use the phrase "at the contractor's expense"; instead use, "at no cost to the state" or "absorbed in the cost of other contract items."
7. **Balance, remainder.** Use the term "balance" when referring to money. Use "remainder" to describe something or material left over.
8. **Coarse, course.** Use "coarse" to describe textures and "course" for layers.
9. **Conform.** Use the word "conform" to refer to dimensions, sizes, and fits that must be strictly adhered to (e.g., "cut bolt threads conforming to American Standards Association (ASA) Standards, Class 2 fit, coarse thread series"). Where a better product is acceptable, use the phrase "meeting the requirements of..." (e.g., aggregates meeting the specification requirements when tested in accordance with AASHTO T27.)
10. **Contractor.** Use the word "contractor" in place of the word "bidder" when writing Special Provisions for construction. Only use "bidder" for proposals.
11. **Or equivalent.** Use this phrase for only minor parts. The contractor may not know what is truly equivalent before awarded the contract. It is better to clearly specify those things that will be accepted as "equivalent."

12. **Proposal.** Do not use the word “proposal” when the word “contract” is intended. Only use “proposal” to describe requirements during the bidding process.
13. **Resisting, resistant.** Do not use “corrosion-resisting,” but instead use, “corrosion-resistant.”
14. **Said.** Do not use “said pipe” or “said aggregates,” but instead use “this pipe” or “these aggregates.”
15. **Same.** Do not use “same” to replace a pronoun like “it” or “them” standing alone, such as “connected to same,” “specified for same,” “same will be given consideration,” “conforming to requirements for same.” Rewrite the sentence to clearly describe what is meant.
16. **Shall, will.** Do not use “shall.” Use “will” to describe actions performed by MDT. Be careful with the use of “will” as action by MDT may be unintentionally implied.
17. **Such.** Do not end a sentence with the word “such.” “Such” usually means “of this or that kind,” or similar to something stated. Instead, either state that which is actually meant, name the work to be completed, or rephrase the sentence.
18. **Symbols.** Do not use the following symbols when writing Special Provisions:

<u>Symbol</u>	<u>Write Instead</u>
/	per, or “a”
X°	°F or degree Fahrenheit
%	percent
+	plus
–	minus
x	by

19. **The.** Do not eliminate “the” for brevity.
20. **Thoroughly.** Avoid using the adverb “thoroughly” (e.g., thoroughly wet, thoroughly dry, thoroughly clean) as it is unenforceable. Preferably, state the value of the intended requirements (e.g., in percent, in dimensions, or in number of passes).