Civil Engineering Writing Project - Grammar & Mechanics Lesson 2

VERB TENSE – REPORTING METHODS

1. Objectives and important terms

By the end of this unit, you should be able to

- use verb tense for accurate meaning when reporting methods, including describing past actions and integrating statements about current locations and purposes
- recognize and correct the most common errors in verb tense made by civil engineering students when they report methods.

Important terms and concepts for understanding correct verb tense choices

verbs: Words that describe actions or express existence – e.g. *conduct, use, measure, is*
tense: Verb forms that express time meanings. Tense appears in both active and passive voice.

tense	verb in active voice	verb in passive voice
past	*conducted*	*was conducted*
present	*conducts*	*is conducted*
future	*will conduct*	*will be conducted*

Verb tenses can also be used in perfect and progressive forms (expressing meanings about the duration or continuation of actions). Notice the tense is on the first part of the verb phrase (past/present: *had/has*, *was/is*).

tense	verb in active voice	verb in passive voice
past perfect	*had conducted*	*had been conducted*
present perfect	*has conducted*	*has been conducted*
past progressive	*was conducting*	*was being conducted*
present progressive	*is conducting*	*is being conducted*

imperative: A verb form used to give commands, instructions, advice, and warning – for example, ***Place*** *the sample on the scale.* ***Be*** *careful.*

If you want more explanation of all verb forms, consult a thorough grammar reference (see resources on the Civil Engineering Writing Project website). Language Unit 5 covers active and passive voice in detail.

2. Background: Verb tense and meaning

A. Verb tenses express meanings about the time frame of activities. They must be used accurately when you write for engineering or your content is wrong – just as an error in a calculation makes your content wrong.

Basic distinctions in the meaning of verb forms

Verb form	Most common meaning	Examples
past tense	happened in the past, was true in the past	The length of the sample **was measured**. We **conducted** all work according to the 2015 Oregon Standard Specifications for Construction.
present tense	is happening now, is true now, or is true generally	The length of the sample **is measured**. We **conduct** all work according to the 2015 Oregon Standard Specifications for Construction.
future	will happen or be true in the future	The length of the sample **will be measured**. We **will conduct** all work according to the 2015 Oregon Standard Specifications for Construction.
imperative form	commands, instructions, advice, and warnings (similar to "You must...")	**Measure** the length of the sample. **Conduct** all work according to the 2015 Oregon Standard Specifications for Construction.

B. Some writers have heard a rule that all the verbs in a paragraph must be in the same tense. That is not correct. Sometimes tenses are consistent in a paragraph; sometimes they are not. The tense depends on the meaning being expressed. Example 1 uses present, past, and future. Example 2 uses only past tense. Both have accurate use of verb tense.

Example 1. From the executive summary of a hydraulic analysis for a new bridge

The Sweet Creek Bridge #0327 is located on the West Waterford Highway (SR-22) at MP 42.86 at the Waterford - Anderson County Line. The bridge, which was built in 1932, lies partially in the Washington National Forest. It is a narrow concrete structure, 6.7 meters wide and 101 meters long. Its sufficiency rating is 42.4 (1999). Its average daily traffic (ADT) is 2700 (1997).

The new bridge will be located to the east (upstream) of the existing structure. It is designed to be a three span structure, 16.8-meters wide and 109 meters long. The proposed ADT is 4320 (2017).

The paragraph begins in present tense to describe the current bridge location.

It changes to past tense to tell when in the past the bridge was built.

It returns to present tense to describe more characteristics of the current bridge.

The second paragraph begins with the future to tell where the new bridge will be.

It then changes to present tense to describe the design and proposed ADT because those are currently true. (The plans and proposed ADT exist now even if the new bridge is not built.)

Example 2. From the section of a practitioner report that describes the methods for a storm sewer system analysis

A runoff analysis was performed of the properties adjacent to the proposed improvements to check pipe capacities and size the new storm lines. The area east of Highway 213 was divided into sixteen sub-basins based on inlet spacing and other features. The sub-basins were labeled alphabetically from A to P. The peak flows were used to check existing pipe capacities and make upgrades as necessary.

Past tense is the only verb tense in the paragraph because all the verbs describe past actions.

3. Verb Tense for Reporting Methods

A. The methods used for collecting and analyzing data are important in the practice of engineering. You must state what you did accurately, including the time frame. When you describe completed procedures and processes, you are describing past activities – so you need past tense. Wherever methods are reported – in a lab report section, in a few sentence in a site visit memo, in multiple sections of an investigation and design report – past tense will dominate. You saw this in Example 2.

B. Present tense occasionally is needed in a methods description. The most common reasons are the following.

Reason for present tense	**Example from methods descriptions in practitioner reports and student lab reports**
1. stating what is in an appendix, figure, or table	The 500-year discharge was analyzed in the HEC-RAS model. The input and output for the HEC-RAS analysis is presented in the Appendix. (Stormwater report) We used two equations to find theoretical and measured values. The calculations are included in the Appendix. (Student lab report – methods section)
2. explaining the purpose or components of a method or tool	Levels of Service for the First Avenue/NW Chavez Street intersection were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. (Design report) The apparatus used to conduct this experiment was the Technovate Fluid Circuit System, Model 9009 (Figure 1). This pipe system is comprised of copper pipes of varying diameters (1-inch, 3/4-inch, and 1/2-inch) through which water is pumped. (Student lab report – apparatus section)
3. describing a location or other physical characteristics of an existing structure or project area	The project site is within a known sensitive area for cultural resources. A record search identified 14 known recorded historical sites... (Design report) Note: This use is uncommon in student lab reports. Locations and structures (such as characteristics of the building where the lab took place) are usually not important for the methods.

C. Imperative verb are used in methods only when directing a reader to an appendix or visual – e.g. *see Figure 3*.

D. Future is not needed in methods sections unless you are proposing future work, for example in proposals or in design reports that discuss planned future actions. Those uses are not covered here.

4. Common Errors to Avoid When Reporting Methods

These errors are especially common in student lab reports. However, lab reports should be the easiest sections to write because they usually just report past actions! More advanced reports, such as for large design projects, tend to require more switching into present tense to describe purposes, locations, and other current characteristics.

1. **Do not switch between past and present when you are narrating a past sequence of activities.**
   A change in verb tense is a change in time meaning. If you are simply describing past actions, use past tense.

   Incorrect

   The MTS **was started**, and the test **begins**. The specimen **is pulled** one tenth of an inch per minute until...

   Correct

   The MTS **was started**, and the test **began**. The specimen **was pulled** one tenth of an inch per minute until...

2. **Do not use the imperative (command) verb form when you describe past actions.**
   Lab instructions are usually written using imperatives because they are instructions. Your description of what you did should use past tense.

   Incorrect

   After each specimen **was labeled**, the tension tests **were conducted**. **Place** two pieces of reflective tape approximately 1 one inch apart...

   Correct

   After each specimen **was labeled**, the tension tests **were conducted**. Two pieces of reflective tape **were placed** approximately 1 inch apart...

Be careful not to copy lab manual instructions word for word even if you change imperatives to past tense. The instructions were written by someone else and copying them is plagiarism. You need to write a coherent narrative of your actions in your own words.

5. Practice

a) Complete the following methods description using the correct tense for the verb in brackets. (This student is using passive voice rather than any human agents at the request of the instructor.)

Student Lab Report

Identical tensile test procedures were performed on all test specimens. Each of the metal specimens ____1____ [*have*] an indentation near the center to ensure that the fracture point would occur in this region. Tension tests ____2____ [*conduct*] as follows.

Two pieces of reflective tape ____3____ [*place*] approximately 1 inch apart in the center of the specimen where the indentation ____4____ [locate]. The width and the thickness of the specimen at this location ____5____ [*measure*] using a Vernier caliper. Then the specimen ____6____ [*secure*] in the MTS Load Frame. A laser extensometer ____7____ [*place*] into position to measure the deformation of the specimen. The laser extensometer ____8____ [*use*] to measure the original distance between the pieces of reflective tape. The MTS ____9____ [*set*] to elongate the specimen one tenth of an inch every minute.

b) The following methods descriptions contain some variation in verb tense. For each underlined verb, decide whether the tense expresses accurate meaning. If not, change the tense to make it accurate. The verbs are numbered for your reference.

Student Lab Report

A compression test was performed[1] on moisture-cured concrete specimens 7 days, 14 days, and 21 days after mixing. Each specimen has[2] a diameter of 6 inches and a height of 12 inches, in accordance with ASTM standards. Each specimen is positioned[3] vertically between two bearing blocks in a compression apparatus (see Figure 1). A load was applied[4] hydraulically through the upper block at a rate of 30 psi/sec. The load will be applied[5] continuously until specimen failure.

Transportation Safety Analysis Report

The Phantom Creek Advanced Curve Warning System (ACWS) consists[6] of the following key elements at each sign location: a dynamic message sign (DMS), a radar unit for speed measurement, a controller unit and computer software to manage the speed inputs and (locally) modify the sign message. Fortunately, the existing sign bridges had[7] sufficient structural capacity to accommodate the DMS without modifications. Each DMS was installed[8] overhead on an existing sign bridge as shown in Figure 3.3. For speed measurement a radar unit was used[9]. The radar units were pole-mounted[10] near the sign bridges on the right shoulders at heights of 20 feet above the pavement. The sensors use[11] Doppler technology to detect vehicle speeds and travel direction, which is[12] important for filtering vehicles traveling in the opposite direction. The devices have[13] two detection modes: strongest and fastest. Throughout the duration of this study, the fastest mode was selected[14].

c) Below are a student's notes for writing up part of the methods section for a lab she just completed. The lab concerned the properties of wood. Use the notes to write sentences reporting the methods.

- next part of lab – compression test parallel to grain
- block of spruce, dimensions 2 in. x 2 in. x 8 in. – placement: lengthwise on platform of controlled deformation machine
- load - applied through a metal bearing plate
- deformation – measurement by the LVDT (linear variable differential transformer)
- magnitude of load applied to the block – measurement by the load cell (similar manner to beam used in static bending test)
- load increase incrementally until failure

d) Review the methods reporting in a paper you have written (either a lab report or another kind of report that required reporting how an investigation was conducted). Analyze at least six sentences in the methods section, revising any errors you made in verb tense. Show your original and revisions.

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