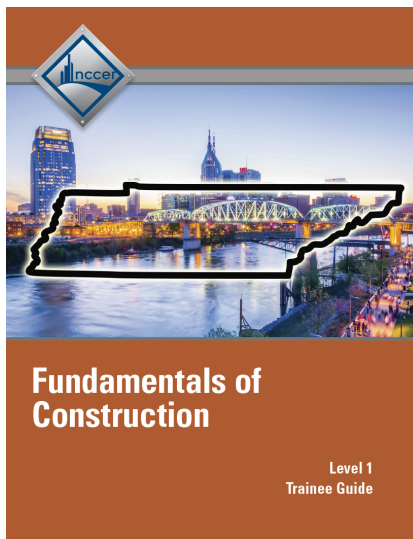


Pearson

Tennessee CTE 2016 Adoption: Fundamentals of Construction

Tennessee Fundamentals of Construction (Level 1), Trainee Guide

ISBN: 9780134529639



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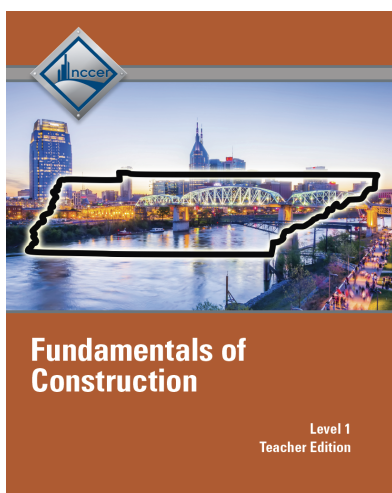
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Tennessee CTE 2016 Adoption: Fundamentals of Construction

Tennessee Fundamentals of Construction (Level 1), Teacher Edition with Online Access

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Tennessee Construction Level 1 Trainee Guide

Pearson Response to TN Reviewer Comments

List of Changes

- An addendum containing new material was added the Trainee Guide.
- A corresponding addendum containing new material was added to the Instructor Guide.
- Tables of Contents for the Trainee Guide and the Instructor Guide were updated to show the addition of the addenda.

Addenda Details

The **Trainee Guide Addendum (Tennessee Learning Addendum)** contains college and career readiness content and eight additional NCCER modules:

00101-15 Basic Safety
44105-08 Construction Documents
44101-08 Introduction to Project Management
00108-15 Basic Employability Skills
00107-15 Basic Communication
00105-15 Introduction to Construction Drawings
26103-14 Introduction to Electrical Circuits
26104-14 Electrical Theory

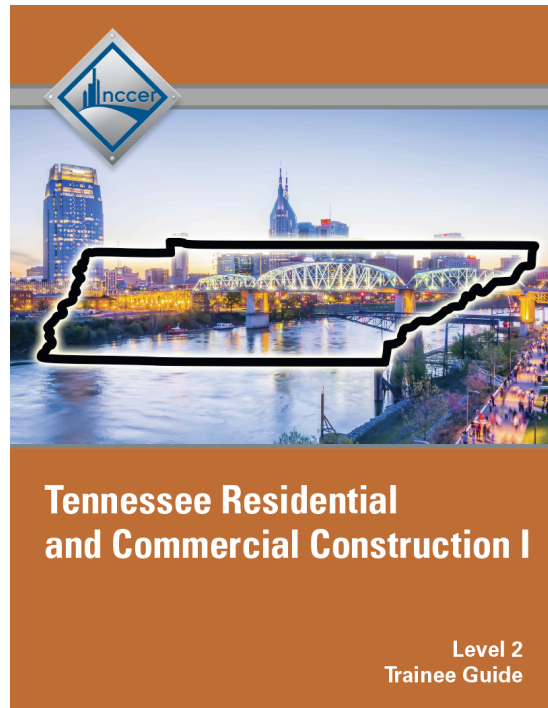
The **Instructor Guide Addendum (Tennessee Teaching Addendum)** contains college and career readiness content and the instructor support for the same eight additional NCCER modules:

00101-15 Basic Safety
44105-08 Construction Documents
44101-08 Introduction to Project Management
00108-15 Basic Employability Skills
00107-15 Basic Communication
00105-15 Introduction to Construction Drawings
26103-14 Introduction to Electrical Circuits
26104-14 Electrical Theory

The **Tennessee Teaching Addendum** also contains additional instructor support for Tennessee Department of Education Standards: Safety (1), Career Exploration (5) and (6), Construction Industry Principles (7), Site Layout (9), Foundation Systems and Properties of Concrete (11), (12), and (15), Framing Systems Overview (16), Floor Framing Systems (19), Wall and Ceiling Framing Systems (22), Wall and

Ceiling Framing Systems (23), Business and Project Management (27), (28), and (30)

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**To the
Tennessee Learning Expectations
for
Residential & Commercial
Construction I**

TEXTBOOK NARRATIVE FOR THE STATE OF TENNESSEE

Tennessee Residential and Commercial Construction I (Level 2), ©2017
ISBN: 978-0-13-452963-9

SUMMARY:

This custom text contains selected modules from NCCER's Construction Technology curriculum designed by highly qualified subject matter experts and includes theoretical and practical skills, and is ideal for programs in construction. It consists of modules from various NCCER programs and is available in full color.

To provide a comprehensive, user-friendly resource, the text incorporates various features to provide students with the proper tools to get started in the trade. These features include:

- Learning objectives, Performance Tasks, and Trade Terms are found at beginning of each module
- Color illustrations and photographs are used throughout the text to highlight important concepts and help clarify complex instructions
- Special Features provide a head start for those entering the field by presenting technical tips and professional practices from operators in various disciplines
- Safety features are set off from the main text in highlighted boxes and organized into Notes, Cautions, and Warnings based on the potential danger of the issue being addressed
- Going Green looks at ways to preserve the environment, save energy, and make good choices regarding the health of the planet
- Did You Know features offers hints, tips, and other helpful information from the trade
- Step-by-step instructions guide students through technical procedures and tasks
- Each module presents a list of Trade Terms that are discussed within the text and defined at the end of each module
- Review Questions at the end of each module are provided to reinforce the knowledge students have gained

Supplements:

A printed Teacher Edition, ISBN 978-0-13-452964-6, contains an instructor's copy of the student edition as well as lesson plans for each module.

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Standards for Residential & Commercial Construction I**

Tennessee Department of Education Standards for Residential & Commercial Construction I	Tennessee Residential and Commercial Construction I (Level 2), ©2017
Residential & Commercial Construction I	
Course Standards	
Safety	
1) Identify safety hazards on a jobsite and demonstrate practices for safe working conditions. Accurately read, interpret, and demonstrate adherence to safety rules, including but not limited to rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines, and state and national code requirements. Be able to distinguish between the rules and explain why certain rules apply. Perform a hazard assessment for a given task such as changing the light bulbs in a classroom. Explain the steps necessary to safely perform the task, outlining procedures to follow in the case of an emergency. (TN Reading 3, 4, 6; TN Writing 2)	68112-09 Electrical Safety SE/TE: Entire Module 00105-15 Basic Safety SE/TE: See SE/TE Addenda
2) Maintain safety records and demonstrate adherence to industry-standard practices regarding general machine safety, tool safety, equipment safety, electrical safety, and fire safety to protect all personnel and equipment. For example, when operating tools and equipment, regularly inspect and carefully employ the appropriate personal protective equipment (PPE), as recommended by Occupational, Safety & Health Administration (OSHA) regulations. Incorporate safety procedures when operating tools and equipment, such as hand and power tools, ladders, scaffolding, and lifting equipment. Complete safety test with 100 percent accuracy. (TN Reading 3, 4)	68112-09 Electrical Safety SE/TE: Entire Module 00105-15 Basic Safety SE/TE: See SE/TE Addenda
3) Follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication Standard (HazCom), such as locating and interpreting material safety data sheets (MSDS). Demonstrate safe procedures to move materials by planning the movement, properly lifting, stacking, and storing materials, and selecting proper materials-handling equipment. (TN Reading 3, 4)	68112-09 Electrical Safety SE/TE: 7.0.0-8.0.0, 12.0.0-15.0.0 00105-15 Basic Safety SE/TE: 1.3.0-1.3.5, 6.1.0, 6.1.4 See SE/TE Addenda
Tools & Equipment	
4) For each of the systems covered in this course, identify and select the proper tools and accessories, critique the readiness of the tools, use the tools to accomplish the desired tasks, and then return the tools and accessories to their proper storage locations. For example, demonstrate the ability to safely use a darby or bullfloat to level a concrete surface and effectively clean and store the tool. (TN Reading 3; TN Math N-Q)	68103-09 Handling and Placing Concrete SE/TE: 3.0.0-3.2.7, 5.1.0-5.2.0, 10.0.0-11.2.0 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 6.0.0
Career Exploration	

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5) Referencing data from U.S. Department of Labor and other sources, explain an apprenticeship. Write persuasively to describe the benefits of the apprenticeship approach of on-the-job training paired with related training for individuals seeking construction careers. Use a variety of sources to gather data, cite each source, and briefly describe why the chosen source is reliable. (TN Reading 1, 7, 8; TN Writing 1, 8, 9)	See TE Addendum
6) Research apprenticeships and postsecondary institutions (colleges of applied technology, community colleges, and four-year universities) in Tennessee and other states that offer construction-related programs. Write an informative paper or develop an infographic identifying entry requirements for a specific apprenticeship or postsecondary program of study, and the secondary courses that will prepare students to be successful in the program. (TN Reading 1, 3; TN Writing 4, 7)	See TE Addendum
Construction Industry Principles	
7) Investigate and report on the process for determining the zoning regulations for a particular building site. Describe how zone designation and regulations such as setbacks, ground coverage, and maximum height impact the design and placement of a building on a given site, citing findings from the investigation. (TN Reading 2, 3, 4; TN Writing 2)	See TE Addendum
8) Explain inspection procedures used to enforce building codes during the construction of a residential or commercial building, outlining the roles and responsibilities of the building inspector and the contractor and the intervals at which inspections are performed. (TN Reading 2, 3, 4)	44101-08 Introduction to Project Management SE/TE: 5.3.0 See SE/TE Addenda
Site Layout	
9) Describe the basic procedures by which surveyors create site drawings. Read and interpret a site drawing to determine the steps, personnel, equipment, and materials needed to prepare a site for construction. Relate the site features labeled on the plan to the layout and topography on the actual site. Develop a timeline and action steps needed to complete a site layout. (TN Reading 1, 2, 4, 6, 7; NCCER 68101-09)	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 2.0.0-3.0.0 See SE/TE Addenda
10) Apply the appropriate mathematical principles, tools, equipment, and procedures to accurately lay out a site, including:	
a. Estimating distances by employing pacing techniques. (TN Math N-Q; NCCER 68101-09)	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 8.0.0

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Tennessee Department of Education Standards for Residential & Commercial Construction I	Tennessee Residential and Commercial Construction I (Level 2), ©2017
b. Completing precise measurements with manual or electronic equipment, using mathematical concepts as necessary, such as converting decimal feet to feet and inches or applying right triangle rules such as the 3-4-5 rule. For example, in the process of staking the corners of a building using taping procedures, calculate the diagonal of the building by plugging the length and width of the building into the Pythagorean Theorem. Then, use the diagonal value to locate the third corner and check the completed layout for accuracy. (TN Reading 3; TN Math N-Q, G-SRT; NCCER 68101-09)	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 7.0.0-7.4.2, 15.0.0
c. Describing the tools, equipment, and procedures involved in establishing elevations on a site. For example, use a builder's level to determine site and building elevations. (TN Math N-Q; NCCER 68101-09)	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 6.0.0-6.6.0
d. Annotating site layout data using proper field note techniques. (TN Writing 4; NCCER 68101-09)	Construction Technology: 68101-09 Site Layout One: Distance Measurement and Leveling SE/TE: 12.0.0
Foundation Systems and Properties of Concrete	
11) Draw on construction texts and other technical documents to compare and contrast types of foundation systems and footings. Create a written report or visual description outlining the structure and properties of each type. Describe the conditions, costs, and other factors that influence the decision to use each type of system. (TN Reading 2, 4, 5, 7; TN Writing 2; NCCER 68102-09)	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms SE/TE: 9.2.0-9.4.3 See SE/TE Addenda
12) Describe the composition of concrete by listing the materials used to make concrete. Analyze the factors that impact the compression strength of concrete, such as the water-cement ratio. Identify additional materials used in concrete construction, such as reinforcement materials and forms. For example, create a comparison chart outlining the materials, forms, and reinforcement used in concrete for a sidewalk versus a bridge. (TN Reading 2, 4, 5, 7; TN Writing 2, 9; TN Math N-Q; NCCER 68102-09)	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms SE/TE: Entire Module. See SE/TE Addenda
13) Calculate the total volume of concrete and the specific materials necessary for a given project based on construction drawings and specifications. Use the information to estimate the amount of each material needed to mix concrete for the project. (TN Reading 4, 6; TN Math N-Q, G-GMD, G-MG; NCCER 68102-09)	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms SE/TE: 7.0.0-7.2.1

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14) Analyze factors influencing the curing of concrete, such as the weather, moisture, and the use of control joints. For example, write an explanatory text outlining the procedures necessary to ensure concrete cures properly for a given date and location, including procedures to prevent cracking and recommendations for the spacing of control joints. (TN Reading 2, 3, 4, 5; TN Writing 2, 4; TN Math N-Q; NCCER 68103-09)	Optional Supplement- Construction Technology: 68103-09 Handling and Placing Concrete SE/TE: 7.0.0
15) Apply the appropriate tools, equipment, and procedures to safely place concrete and cleanup after a concrete project. Work in teams to safely and properly employ tools and personal protective equipment (PPE), and follow procedures to construct a simple concrete form, place concrete into the form, and strike-off (screed), level, smooth, edge, and joint concrete to finish the project. (TN Reading 3, 4; NCCER 68102-09)	Construction Technology: 68102-09 Introduction to Concrete, Reinforcing Materials, and Forms SE/TE: 4.0.0-6.3.4 See SE/TE Addenda
Framing Systems Overview	
16) Distinguish among the basic types of wood framing systems, such as platform frames, balloon frames, and post-and-beam frames. Create a chart to define and compare the pros and cons of each, citing examples of when each is used. (TN Reading 1, 2, 7; NCCER 68106-09)	Construction Technology: 68106-09 Floor Systems SE/TE: 2.0.0-2.4.0 See SE/TE Addenda
Floor Framing Systems	
17) Identify the components which make up a floor frame, analyzing the purpose of and interrelationships among each component and explaining the sequence in which each is constructed. (TN Reading 2, 3, 4, 5; NCCER 68106-09)	Construction Technology: 68106-09 Floor Systems SE/TE: 4.0.0-4.5.3
18) Read and interpret construction drawings to determine floor system requirements such as the proper girder and joist size for a given span and floor load, and estimate the amount of material needed to frame a floor assembly. (TN Reading 1, 4, 7; TN Math N-Q; NCCER 68106-09)	Construction Technology: 68106-09 Floor Systems SE/TE: 3.0.0-3.4.0, 7.0.0-8.2.0
19) Describe the procedures necessary to fasten sills to the foundation and construct a floor assembly. Apply the appropriate tools, equipment, and procedures to build a floor assembly. Work in teams to install girders, lay out and install floor joists, install bridging and blocking, and apply subflooring. (TN Reading 3; NCCER 68106-09)	Construction Technology: 68106-09 Floor Systems SE/TE: 5.0.0-6.0.0 See SE/TE Addenda
Wall and Ceiling Framing Systems	
20) Explain the procedure to lay out a wood frame wall, defining and describing the components such as plates, studs, partitions, door and window openings, bracing, and other components. (TN Reading 3, 4; NCCER 68107-09)	Construction Technology: 68107-09 Wall and Ceiling Framing SE/TE: 2.0.0-3.1.0

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21) Read and interpret drawings to determine wall and ceiling frame requirements for a given residential or commercial structure. For example, calculate the length of a stud and estimate the amount of material needed to frame a wall and ceiling assembly. (TN Reading 4; TN Math N-Q; NCCER 68107-09)	Construction Technology: 68107-09 Wall and Ceiling Framing SE/TE: 7.0.0-8.5.0
22) Work in teams to construct a wall frame and ceiling assembly by implementing required safety techniques, tools, and equipment. Accurately measure and lay out the frame; accurately level and plumb the walls. (TN Reading 3; TN Math N-Q; NCCER 68107-09)	Construction Technology: 68107-09 Wall and Ceiling Framing SE/TE: Entire Module. See SE/TE Addenda
23) Compare and contrast the different tools, procedures, and fastening methods used in steel wall framing versus wood wall framing in building construction. Outline the major similarities and differences in each and write persuasively to provide a recommendation to a client for a specific project. (TN Reading 2, 3, 4; TN Writing 1, 4, 9; NCCER 68107-09)	Construction Technology: 68107-09 Wall and Ceiling Framing SE/TE: Entire Module. See SE/TE Addenda
Electrical Systems	
24) Describe how different levels of electrical shock affect the human body. Research current OSHA standards and other regulations specific to electrical systems to identify methods and equipment to reduce the risk of injury due to electrical shock. Drawing on evidence from textbooks and OSHA standards, apply lockout/tagout procedures to ensure safe working conditions. For example, perform a lockout/tagout to prepare to work on an electrical device. (TN Reading 1, 2, 3, 4; TN Writing 9; NCCER 68112-09)	Construction Technology: 68112-09 Electrical Safety SE/TE: 2.0.0-4.4.0
25) Citing technical data, explain the interrelationships among sources of current, voltage, resistance, and power in electric circuits and the units to quantify each (amperes, volts, ohms and watts). Demonstrate understanding of the operation of electrical circuits (series, parallel, and series-parallel circuits) and relate it to the physical laws, such as Ohm's law and Kirchhoff's law, that govern the behavior of electrical circuits and devices such as the function of resistors in electrical circuits. Accurately apply these physical laws to solve problems. For example, use Ohm's law to calculate the current flow of a circuit for an electric dryer with a given voltage and resistance. (TN Reading 2, 3, 4, 5; TN Math N-Q, A-SSE, A-CED; TN Physical Science 2; NCCER 26103-14)	Optional Supplement- Electrical Level One: 26104-14 Introduction to Electrical Theory SE/TE: Entire Module 26103-14 Introduction to Electrical Circuits: 4.0.0-8.3.0 See SE/TE Addenda
Construction Drawings & Specifications	

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<p>26) Inspect and interpret a full set of construction drawings and specifications for a construction project including civil, architectural, structural, mechanical, plumbing, electrical, and fire protection drawings and specifications. Read and interpret different drawing types including plan view drawings, elevation view drawings, section drawings, detail drawings, and schedules. Explain the relationship between different types of drawing and the importance of cross-referencing different types of drawings with one another and cross-referencing drawings with specifications. For example, explain how a floor plan, elevation, and detail drawing may all be used to inform the reader about the layout and material of a given building component, such as a cabinet layout or an exterior wall. (TN Reading 1, 2, 4, 5, 6, 7, 9; NCCER 44105-08)</p>	<p>See SE/TE Addenda 44105-08 Construction Documents SE/TE: 4.0.0-4.3.0 00105-15 Introduction to Construction Drawings: Entire Module. See SE/TE Addenda</p>

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Business and Project Management	
27) Describe strategies used to promote collaboration, trust, and clear communication among internal and external parties on a job site. Practice effective verbal, nonverbal, written, and electronic communication skills for working with colleagues, employers, clients, and other personnel while demonstrating the ability to: listen attentively, speak courteously and respectfully, resolve obstacles in construction, and respond to criticism. For example, assume the roles of a construction business owner and a potential client, listen to the needs of the potential client, and respond to the potential client by email; explain the services provided by the company and the next steps needed to begin the project. Other role playing could include a construction business owner and a potential subcontractor. (TN Reading 2, 3; TN Writing 2, 4; NCCER 00108-09)	See SE/TE Addenda 00108-15 Basic Employability Skills SE/TE: 3.0.0-3.5.1 See SE/TE Addenda 00107-09 Basic Communication Skills SE/TE: Entire Module
28) Describe the components and purpose of a basic contract document for a residential project. Recognize the relationship and responsibilities of various parties to a contract. Write a basic contract for a construction job, such as a carpenter's contract to complete a deck addition for a residential client. (TN Reading 2, 3, 4, 5; NCCER 44105-08)	See SE/TE Addenda Project Management: 44105-08 Construction Documents SE/TE: 5.0.0-5.8.0
29) Interpret construction drawings to determine the correct materials, tools, and equipment needed to complete a construction project. Plan and implement the steps needed to complete the project, adhering to inspection procedures and employing safe practices throughout. Draw from print and electronic examples to create and publish a material list, cost estimation, construction schedule, and inspection checklist for a project, applying the components of the documents to the given project. (TN Reading 2, 3; TN Writing 4, 6)	See SE/TE Addenda 00105-15 Introduction to Construction Drawings: Entire Module
30) Log daily activities completed during a construction project over an extended period of time. Document important facts concisely in a daily report as would a project manager on a jobsite, including daily progress, equipment and materials used, personnel involved, and other work-related activities. Review and revise as appropriate. (TN Reading 3; TN Writing 2, 5, 10)	See SE/TE Addenda 00107-15 Basic Communication: 2.3.0
Portfolio	
31) Update materials from coursework to add to the portfolio started in <i>Fundamentals of Construction</i> . Continually reflect on coursework experiences and revise and refine the career plan generated in the prior course, using technology where appropriate. Include photographs or illustrations and written descriptions of sequential progress in construction projects. (TN Writing 2, 4, 5, 6)	N/A