

State of Michigan

CONCRETE

Business and Law examination specifications and suggested study materials are contained in the Candidate Information Bulletin.

Topic Information	# of Items
PLANNING AND ESTIMATION	10
Estimating Concrete Projects	
Read and interpret plans and specifications	
Evaluate concrete job sites for existing conditions, setbacks, obstructions, and access	
Take measurements and create sketches and specifications to define scope of work for concrete project estimates	
Calculate amounts of soil, concrete, and other debris for export	
Estimate material requirements and costs	
Estimate equipment and subcontracted service requirements and costs	
Pull the proper permits	
Planning Concrete Projects	
Collaborate with ready mix suppliers to determine concrete mix designs	
Prepare for climate impact on concrete placement	
Locate and secure utilities (MISS DIG)	
Prepare concrete placement schedules	
Site Preparation	16
Determining Property Lines and Easements	
Identify, flag, and post property lines and easements	
Demolition, Grading, and Excavating	
Determine elevations to control drainage, and install erosion control devices according to Stormwater Pollution Prevention Plan (SWPPP) requirements	
Demolish concrete, asphalt, landscaping, and debris from job sites, including removal and disposal	
Prepare for concrete installation by grading and compacting the soil/base material	
Identify proper soils for concrete projects	
Excavate soil for footings, caissons, trenches, and underground structures	
Layout and Forming	
Procedures for using and maintaining levels, tape measures, transits, lasers, and string lines for concrete job	
Set forms to finish grade/elevation of concrete	



Installing Drains and Moisture Barriers	
Install drains (e.g., perforated, solid) and weep holes to divert water from concrete flatwork and walls	
Install moisture barriers behind concrete walls and under slabs	
Installing Reinforcement and Embedded Items	
Install embedded hardware, rebar, decorations, and expansion joints into forms to strengthen the concrete	
Complete required inspections for concrete projects with regulatory agencies, architects, and engineers	
Concrete Application Procedures	14
Placing and Finishing	
Place concrete into footings or forms to finish height including vibrating and screeding	
Finish concrete to level and consolidate (e.g., bull float, edge, trowel)	
Install concrete footings, pads, slabs, foundation walls, retaining walls, flatwork, and specialty work	
Install control joints to prevent cracking	
Apply specified finish to concrete (e.g., hard trowel, broom, sand, stamps)	
Curing and Testing	
Cure concrete to control hydration/cracking and protect it from freezing	
Complete tests prior to and during pours to ensure compliance with specifications and standards	
Finishing Procedures	9
Applying Overlays, Stains, and Sealers	
Use appropriate overlays, stains, and sealants to protect surfaces (e.g., dampproofing, waterproofing)	
Stripping Forms, Repairing, Grouting, and Caulking	
Strip forms from concrete	
Clean concrete, repair cracks, flakes, and curling (e.g., grouting, patching, grinding, caulking)	
Perform concrete sawing and drilling	
SAFETY AND PUBLIC PROTECTION	6
MIOSHA Regulations	
Follow MIOSHA regulations for maintaining a safe work environment (e.g., sanitation, emergency action plans, first aid kits, safety training, fall protection, safe use of tools, equipment, ladders, and scaffolds)	
Site Safety and Personal Protection	
Set up barriers and traffic patterns to protect concrete work, the public, and workers	
Prevent injuries and exposure to harmful conditions by using personal protective clothing and respiratory equipment	
Environmental Safety Concerns	
Use required dust/silica reduction systems when operating power tools or equipment on concrete	
Dispose of contaminated materials generated at job sites in accordance with regulations (e.g., stain, sealer, acid)	

Suggested Study Materials

Except for the Michigan Laws, Rules, Codes and Standards, neither the Department nor PSI endorses any of the materials listed. However, we try to ensure that the references are currently available and consist of recognized industry standards.

If the answer to a specific examination question could differ because of conflicting information contained in the suggested study materials, the legal requirement, such as a law, regulation, board or commission rule, or building code, takes precedence over (overrides) any other reference. If two legal requirements appear to conflict, the Michigan specific law, regulation, board or commission rule, or building code, takes precedence over the national one. Information from the suggested study materials listed here takes precedence over information from all other sources or persons.

This is only a sample of the available reference materials that contain information about the professions. These materials contain neither all of the general trade knowledge required to be competent in any specific area nor all of the information on which you will be tested. Also, please be aware that reference materials may go out of print or be otherwise unavailable.

Please contact a library, community college, currently practicing builder or contractor, Code enforcement agency, or other specialists in the profession for additional information or reference material.

These examinations are CLOSED BOOK, so the following reference materials suggested as study resources are not allowed in the examination center.

- *Michigan Residential Code*, 2015, Michigan Department of Licensing and Regulatory Affairs, Bureau of Construction Codes, PO Box 30255, Lansing, MI 48909, (517) 241-9313, <https://www.michigan.gov/lara/0,4601,7-154-10575--00.html>
- *Michigan Occupational Safety and Health Act: Act 154 of 1974*, Michigan Department of Licensing and Regulatory Affairs Occupational Safety & Health Administration, 525 W. Allegan Street, P.O. Box 30643, Lansing, MI 48909-8143, https://www.michigan.gov/lara/0,4601,7-154-11407_52824---00.html
- *International Building Code*, 2018, International Code Council, (800) 786-4452, www.iccsafe.org
- *The Contractor's Guide to Quality Concrete Construction*, Third Edition, 2014, ISBN 978-0-87031-167-3, American Concrete Institute, 38800 Country Club Drive, Farmington Hills, MI 48331, (248) 848-3800, www.concrete.org

- *Placing Reinforcing Bars*, Ninth Edition, 2011, Concrete Reinforcing Steel Institute, 933 North Plum Grove Rd, Schaumburg, IL 60173, Phone (847) 517-1200, www.crsi.org
- *Carpentry and Building Construction*, 2016, Mark D. Feirer and John L. Feirer, ISBN: 978-0-02-140244-1, McGraw-Hill Education, 8787 Orion Place, Columbus, OH 43240, www.mheducation.com/prek-12
- *SP-4 Formwork for Concrete*, 2014, David W. Johnston, ISBN: 9780870319129, American Concrete Institute, 38800 Country Club Drive, Farmington Hills, MI 48331, (248) 848-3800, www.concrete.org

