



End of Course (EOC) Bank Blueprints

Mechanical, Electrical, and Plumbing

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About Test Blueprints

Test blueprints are created to provide guidance to Subject Matter Experts (SMEs) during the item writing phase of test development. In addition, we believe that they can assist those instructors who did not participate in item writing (and administrators) to understand the broad content of the item bank. Items are formally allocated across a course outline in a three-step process*:

1. CETE psychometricians use a formula which assumes that all competencies within a course outline are *essential* and of equal importance to produce a suggested test blueprint for review by Ohio Department of Education program specialists and SMEs.
2. SMEs review the blueprint as a large group before item writing for a specific EOC test. There and in small groups, SMEs review the course outline and have the ability to make changes to the blueprint with a documented rationale based on their experience and expertise.
3. Any revisions during small group work must be approved by the larger panel of SMEs attending an item writing workshop, which is the last step and produces the final blueprint which is summarized in this document.

Test blueprints can provide high-level guidance to instructors on preparing students for testing. It is important to keep in mind that the blueprint is a tool that is used when developing the test item bank during initial item writing and test creation. As with all tests, the End-of-Course test forms are a sample of the item bank.

Interpreting the Blueprints

Test blueprints display the total number of test items SMEs planned to write to a particular *outcome* (as designated in the course outline created by the Ohio Department of Education Office of Career-Technical Education or by a vendor). The blueprint describes structure of the item bank which is the total pool of test items created. Final test forms of 40-items are created from the item bank.

* This newer process for producing test blueprints was implemented October 1, 2015. Item banks created prior to this date were completed under a different blueprint process and therefore we are looking backward to provide the structure of the item bank. As revisions are completed for those career fields, for example Information Technology (2017-18), the blueprint process used will be the newer model.

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Construction Technology-Core and Sustainable Construction

ODE Subject Code: 178000

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 1. Business Operations/21st Century Skills		
1.01	Employability Skills	8.54
1.02	Leadership and Communications	7.32
1.03	Business Ethics and Law	4.88
1.04	Knowledge Management and Information Technology	2.44
1.05	Global Environment	4.88
1.06	Business Literacy	2.44
1.09	Financial Management	3.66
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	19.51
2.02	Personal Safety	6.10
Strand 6. Planning Design		
6.04	Construction Drawings	7.32
6.05	Construction Math	10.98
Strand 7. Construction and Facility Maintenance		
7.01	Construction Scheduling	7.32
7.02	Field Organization	7.32
7.05	Maintenance Operations	7.32



Carpentry and Masonry Technical Skills

ODE Subject Code: 178001

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	2.41
2.02	Personal Safety	2.41
Strand 3. Structural Construction		
3.01	Brick, Block, and Concrete	14.46
3.02	Site Management	6.02
3.04	Floor Framing	14.46
3.05	Wall Framing	14.46
3.06	Roof Framing	14.46
3.07	Exterior Finish Work	7.23
3.08	Stairs	15.66
Strand 6. Planning Design		
6.04	Construction Drawings	8.43
6.05	Construction Math	8.43



Mechanical, Electrical and Plumbing Systems

ODE Subject Code: 178002

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	11.11
2.02	Personal Safety	12.96
2.04	Equipment and Machinery Preventative Maintenance	3.70
Strand 4. Low Voltage Systems		
4.01	Electrical Theory	12.96
4.02	Circuits	12.96
4.04	Low Voltage Systems	9.26
4.05	Electrical Wiring	12.96
Strand 5. Environmental Systems and Plumbing		
5.01	Refrigeration	11.11
5.02	Heating, Ventilation, Air Conditioning/Refrigeration (HVAC/R) Systems Installation	12.96
5.03	Service Maintenance	14.29
5.06	Sheet Metal	20.00
5.07	Drainage	14.29
5.08	Water Systems	22.86
Strand 6. Planning Design		
6.04	Construction Drawings	14.29
6.05	Construction Math	14.29



Construction Electrical Systems

ODE Subject Code: 178007

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	5.75
2.02	Personal Safety	4.60
2.04	Equipment and Machinery Preventative Maintenance	4.60
Strand 4. Low Voltage Systems		
4.01	Electrical Theory	28.74
4.02	Circuits	9.20
4.03	Codes and Regulations	6.90
4.05	Electrical Wiring	18.39
Strand 6. Planning Design		
6.04	Construction Drawings	10.34
6.05	Construction Math	11.49



Residential Electrical Systems

ODE Subject Code: 178008

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	8.51
2.02	Personal Safety	4.26
2.04	Equipment and Machinery Preventative Maintenance	0.00
Strand 4. Low Voltage Systems		
4.01	Electrical Theory	25.53
4.02	Circuits	11.70
4.03	Codes and Regulations	12.77
4.04	Low Voltage Systems	3.19
4.05	Electrical Wiring	24.47
Strand 6. Planning Design		
6.04	Construction Drawings	5.32
6.05	Construction Math	4.26



Commercial and Industrial Construction Electrical Systems

ODE Subject Code: 178009

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	12.05
2.02	Personal Safety	6.02
2.04	Equipment and Machinery Preventative Maintenance	3.61
Strand 4. Low Voltage Systems		
4.02	Circuits	3.61
4.03	Codes and Regulations	14.46
4.05	Electrical Wiring	31.33
4.06	Motors and Power	10.84
Strand 6. Planning Design		
6.04	Construction Drawings	12.05
6.05	Construction Math	6.02



Pipefitting and Plumbing Systems

ODE Subject Code: 178010

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Business Operations/21st Century Skills		
2.01	Site Safety	5.43
2.02	Personal Safety	5.43
2.04	Equipment and Machinery Preventative Maintenance	1.09
Strand 5. Environmental Systems and Planning		
5.07	Drainage	31.52
5.08	Water Systems	23.91
Strand 6. Planning Design		
6.04	Construction Drawings	17.39
6.05	Construction Math	15.22



Residential and Commercial Plumbing Systems

ODE Subject Code: 178011

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 5. Environmental Systems and Planning		
5.07	Drainage	36.47
5.08	Water Systems	47.06
5.09	Fuel Piping	12.94
Strand 6. Planning Design		
6.04	Construction Drawings	3.53



Heating and Cooling Systems

ODE Subject Code: 178012

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	7.41
2.02	Personal Safety	2.47
2.04	Equipment and Machinery Preventative Maintenance	6.17
Strand 5. Environmental Systems and Plumbing		
5.02	Heating, Ventilation, Air Conditioning/Refrigeration (HVAC/R) Systems Installation	40.74
5.03	Service Maintenance	23.46
5.05	Boiler Systems	2.47
5.09	Fuel Piping	4.94
Strand 6. Planning Design		
6.04	Construction Drawings	4.94
6.05	Construction Math	7.41



HVAC Refrigeration

ODE Subject Code: 178013

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	6.25
2.02	Personal Safety	3.75
Strand 5. Environmental Systems and Plumbing		
5.01	Refrigeration	48.75
5.03	Service Maintenance	20.00
5.09	Fuel Piping	6.25
Strand 6. Planning Design		
6.04	Construction Drawings	7.50
6.05	Construction Math	7.50



Sheet Metal

ODE Subject Code: 178014

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	8.75
2.02	Personal Safety	11.25
Strand 5. Environmental Systems and Plumbing		
5.06	Sheet Metal	46.25
Strand 6. Planning Design		
6.04	Construction Drawings	16.25
6.05	Construction Math	17.50



Telecommunications/Low Voltage Systems

ODE Subject Code: 178015

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	2.25
2.02	Personal Safety	4.49
Strand 4. Low Voltage Systems		
4.03	Codes and Regulations	5.62
4.04	Low Voltage Systems	42.70
4.05	Electrical Wiring	28.09
Strand 6. Planning Design		
6.04	Construction Drawings	3.37
6.05	Construction Math	13.48



Alternative Power Generation Systems

ODE Subject Code: 178016

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	9.76
2.02	Personal Safety	6.10
Strand 4. Low Voltage Systems		
4.03	Codes and Regulations	10.98
4.05	Electrical Wiring	0.00
4.07	Alternative Power Systems	42.68
Strand 5. Environmental Systems and Plumbing		
5.04	Energy Audit	2.44
Strand 6. Planning Design		
6.04	Construction Drawings	4.88
6.05	Construction Math	23.17



Powerline/Hi-Voltage Power Transmission

ODE Subject Code: 178017

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	7.35
2.02	Personal Safety	8.82
2.03	Equipment Operation	10.29
2.04	Equipment and Machinery Preventative Maintenance	5.15
Strand 4. Low Voltage Systems		
4.01	Electrical Theory	47.79
4.02	Circuits	5.15
4.03	Codes and Regulations	8.09
4.05	Electrical Wiring	7.35
Strand 6. Planning Design		
6.04	Construction Drawings	5.15
6.05	Construction Math	2.21



Construction Safety and Crew Leadership

ODE Subject Code: 178018

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 1. Business Operations/21st Century Skills		
1.02	Leadership and Communications	2.30
1.03	Business Ethics and Law	3.45
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	13.79
2.02	Personal Safety	10.34
2.03	Equipment Operation	11.49
2.04	Equipment and Machinery Preventative Maintenance	5.75
Strand 3. Structural Construction		
3.03	Excavation	11.49
3.10	Remodeling	10.34
Strand 4. Low Voltage Systems		
4.03	Codes and Regulations	8.05
Strand 5. Environmental Systems and Plumbing		
5.08	Water Systems	2.30
5.09	Fuel Piping	2.30
Strand 7. Construction and Facility Maintenance		
7.04	Custodial Operations	10.34
7.05	Maintenance Operations	8.05



Plan Reading
ODE Subject Code: 178019

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 3. Structural Construction		
3.02	Site Management	9.41
Strand 6. Planning Design		
6.01	Proposals	21.18
6.04	Construction Drawings	44.71
6.05	Construction Math	24.71



Construction Management

ODE Subject Code: 178022

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 1. Business Operations/21st Century Skills		
1.01	Employability Skills	4.71
1.03	Business Ethics and Law	1.18
1.06	Business Literacy	2.35
1.07	Entrepreneurship/Entrepreneurs	3.53
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	18.82
Strand 3. Structural Construction		
3.02	Site Management	14.12
Strand 6. Planning Design		
6.01	Proposals	11.76
6.02	Community Planning	5.88
6.05	Construction Math	14.12
Strand 7. Construction and Facility Maintenance		
7.01	Construction Scheduling	5.88
7.02	Field Organization	17.65



Facility and Building Maintenance

ODE Subject Code: 178024

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.01	Site Safety	9.68
2.02	Personal Safety	7.53
2.03	Equipment Operation	2.15
2.04	Equipment and Machinery Preventative Maintenance	17.20
Strand 3. Structural Construction		
3.07	Exterior Finish Work	29.03
3.09	Interior Finish Work	5.38
Strand 5. Environmental Systems and Plumbing		
5.05	Boiler Systems	2.15
Strand 6. Planning Design		
6.04	Construction Drawings	26.88



Principles of Wood Construction

ODE Subject Code: 178030

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.1	Site Safety	16.84
2.2	Personal Safety	10.53
Strand 3. Structural Construction		
3.4	Floor Framing	10.53
3.5	Wall Framing	24.21
3.6	Roof Framing	10.53
3.7	Exterior Finish Work	3.16
3.9	Interior Finish Work	10.53
3.10	Remodeling	3.16
Strand 6. Planning Design		
6.1	Proposals	3.16
6.5	Construction Math	7.37



Fundamentals of Architecture and Construction

ODE Subject Code: 178040

Outcome #	Outcome Name	% Items Approved by SMEs
Strand 2. Safety, Tools and Equipment		
2.1	Site Safety	12.63
2.2	Personal Safety	8.42
Strand 3. Structural Construction		
3.2	Site Management	5.26
3.3	Excavation	8.42
3.4	Floor Framing	3.16
3.5	Wall Framing	13.68
3.6	Roof Framing	5.26
3.7	Exterior Finish Work	5.26
3.8	Stairs	3.16
3.9	Interior Finish Work	5.26
Strand 6. Planning Design		
6.3	Drafting	8.42
6.4	Construction Drawings	10.53
6.5	Construction Math	10.53

