Level I (AC) Examination Specifications

Specification Categories with Percentages of Questions on Examination

<table>
<thead>
<tr>
<th>CONSTRUCTION FUNDAMENTALS CONTENT AREA</th>
<th>2012 PERCENTAGE</th>
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<tbody>
<tr>
<td>I. COMMUNICATION SKILLS</td>
<td>13.0</td>
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<tr>
<td>II. ENGINEERING CONCEPTS</td>
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<tr>
<td>III. MANAGEMENT CONCEPTS</td>
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<tr>
<td>IV. MATERIALS, METHODS AND PROJECT MODELING &amp; VISUALIZATION</td>
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<tr>
<td>V. BIDDING AND ESTIMATING</td>
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<td>VIII. CONSTRUCTION SAFETY</td>
<td>7.0</td>
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<tr>
<td>IX. CONSTRUCTION GEOMATICS</td>
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<tr>
<td>X. PROJECT ADMINISTRATION</td>
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<td>TOTAL</td>
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</table>
I. COMMUNICATION SKILLS

A. Technical Reading
B. Technical Writing

II. ENGINEERING CONCEPTS

A. Engineering Material Properties
   1. Aggregate
   2. Concrete
   3. Masonry
   4. Steel
   5. Wood

B. Soil Mechanics
   1. Soil Composition, Types and Properties
   2. Soil Investigation Testing Methods and Soil Borings
   3. Types of Foundations
   4. Field Soil Identification Methods
   5. Volume Changes and Compaction Methods

C. Mechanics and Strength of Materials
   1. Formwork Design
   2. Beam Loads

D. Air and Fluid Mechanics
   1. Psychometrics
   2. Hydrology

E. Electricity

III MANAGEMENT CONCEPTS

A. Contract Forms
   1. Elements of a Contract
   2. Lump Sum
   3. Unit Price
   4. Design Build
   5. Cost Plus
   6. Construction Management

B. Business Entities
   1. Sole Proprietors
2. Partnerships and Joint Ventures
3. Corporations and LLC

C. Accounting and Financial Ratios
   1. Accounting Principles
   2. Financial Reports and Ratios

D. Management Systems
   1. Project Controls
   2. Technology
   3. Current Concepts

E. Business Ethics
   1. Constructor Code of Conduct
   2. Bidding, Purchasing and Professional Practice

IV. MATERIALS, METHODS AND PROJECT MODELING & VISUALIZATION

A. Construction Equipment
   1. Piling Equipment
   2. Sheet Piling, Cofferdams, Tie-backs
   3. Excavation Equipment
   4. Compaction Equipment
   5. Cranes and Lifting Equipment

B. Reading Drawings and Schedules
   1. Sitework
   2. Concrete and Forms
   3. Rebar
   4. Structural Steel
   5. Carpentry
   6. Exterior Finishes
   7. Doors and Windows
   8. Interior Finishes
   9. Mechanical Systems, Processes, and Equipment
  10. Electrical Systems, Controls, and Communications

V. BIDDING AND ESTIMATING

A. Bidding Process
   1. Bid Documents
   2. Scales
3. Types of Specifications
4. Laws, Regulations, and Codes
5. Site Evaluation and Walk-thru
6. Insurance and Bonds
7. Value Engineering and Life cycle Costing
8. Temporary Site Layout

B. Estimates
   1. Conceptual
   2. Total Future Costs
   3. Material Components
   4. Equipment Productivity

C. Quantity Takeoff
   1. Excavation
   2. Forms, Rebar, Concrete
   3. Rough Carpentry
   4. Interior Finishes

VI. BUDGETING, COSTS AND COST CONTROL
   A. Budgeting
      1. Work Breakdown Structure
   B. Cost Control
      1. Productivity Rates, Earned Workhours
      2. Unit Costs
      3. Forecasts at Completion
   C. Finalize Costs
      1. Retainage
      2. Back charges
      3. Payments

VII. PLANNING, SCHEDULING AND CONTROL
   A. Logical Sequences of Design, Procurement and Construction
      1. Multi Crew, Phase Durations, Activity Durations and Effective Durations
   B. Event Times, Calculations, and Scheduling Terminology
      1. Leadtime, Forward Pass, Backward Pass
      2. Total Float, Free Float, ES, EF, LS, LF, Critical Path(s), Completion Time
C. Schedule Analysis
   1. Crashing and Impact

VIII. CONSTRUCTION SAFETY

A. OSHA Administrative
   1. EMR
   2. General Duty Clause
   3. Site Procedures, MSDS
   4. Competent Person and Due Diligence

B. Standard Safety Procedures
   1. Handrails
   2. Ladders
   3. Fire Extinguishers
   4. Excavations setbacks, travel distances
   5. Recordkeeping and Employee Posters

C. Safety Procedures Interpretation
   1. Sloped and Shored Excavations
   2. Scaffolding
   3. Personal protection
   4. Electrical Protection

IX. CONSTRUCTION GEOMATICS

A. Equipment
   1. Tapes, Plumb Bobs, Level Laser, Batter Boards

B. Topography Map
   1. Contours

C. Calculations
   1. Horizontal Distances
   2. Vertical Control Elevations

X. PROJECT ADMINISTRATION

A. Procurement of Resources
   1. Subcontractors
   2. Materials
   3. Equipment
B. Duties/Responsibilities
   1. Construction Management and Engineering Job Descriptions
   2. Organizational Chart
   3. Design, Procurement and Construction Team
   4. Craft Trade Descriptions

C. Job Site Mobilization
   1. Site Layout Considerations
   2. Shop drawing, Product Data Submittal and Review Process
   3. Contract Clauses, Changes, Claims, Dispute Methods
   4. Quality Control, Inspection and Government Regulations

D. Job Site Administration
   1. Human Resources
   2. Project Documentation

E. Project Closeout
   1. Punch Lists, Substantial Completion, Occupancy
   2. Documentation Turnover
   3. Final Payment/Completion

F. Environmental Controls
   1. Sustainability
   2. Storm Water
   3. Hazardous Materials
Level II (CPC) Examination Specifications

Specification Categories with Percentages of Questions on Examination

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<th>APPLICATION &amp; ANALYSIS CONTENT AREA</th>
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<td>I. PROJECT SCOPE DEVELOPMENT</td>
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<td>II. EMPLOYMENT PRACTICES</td>
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<td>III. WORKING RELATIONSHIPS</td>
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<tr>
<td>IV. CONSTRUCTION START-UP AND SUPPORT</td>
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<tr>
<td>V. CONSTRUCTION RESOURCE MANAGEMENT</td>
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<tr>
<td>VI. CONSTRUCTION COST CONTROL</td>
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<td>VII. PROJECT CLOSEOUT</td>
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<td>VIII. CONSTRUCTION RISK MANAGEMENT</td>
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I. PROJECT SCOPE DEVELOPMENT

A. Project Participants Roles
   1. Owner
   2. Architect
   3. Engineer
   4. Professional Constructor
   5. Government Agencies

B. Conceptual Estimating
   1. Assemblies Estimating
   2. Model Area Estimating
   3. Scope Development Classification Systems

C. Budget Monitoring
   1. Project Budget
   2. Construction Budget
   3. Contingency
D. Design Schedule
   1. Schematic Design Schedule
   2. Design Development Schedule
   3. Bid Scope Development Schedule
   4. Procurement and Lead-time Schedule

E. Design Review/Recommendation Process
   1. Schematic Design Schedule
   2. Design Development Schedule
   3. Bid Scope Development Schedule
   4. Procurement and Lead-time Schedule

F. Cost Analysis Design Phases
   1. Value Engineering
   2. Value Analysis
   3. Life Cycle Costing
   4. Variance Analysis
   5. Constructability
   6. Feasibility

G. Site Analysis
   1. Environmental Conditions
   2. Site conditions, Site survey and Geological conditions
   3. Regulatory agencies, permits

H. Bid Scope Development
   1. Trade Bid Packages
   2. Bid Breakdown and Proposal form requests

I. Bid Document Development
   1. Notice to Bidders, Instructions to Bidders, Addenda, General Requirement
   2. Pre-qualification of Bidders
   3. Pre-bid Meetings

J. Bid Analysis and Selection/Recommendations
   1. Construction Bid Scope Analysis
   2. Subcontractor and Vendor Evaluation

K. Construction Contracts and Construction Schedule
   1. Construction Contracts
   2. Construction Project Schedule with Lead times, Inspections
II. EMPLOYMENT PRACTICES

A. Employment Law
   1. Equal Employment Opportunity
   2. American with Disabilities Act
   3. Immigration Act

B. Discrimination Law
   1. Hiring Discrimination
   2. Employment Discrimination
   3. Sexual Harassment
   4. Hostile Work Environment

C. Management Responsibilities
   1. Management Liability
   2. Employment Documentation

D. Construction Labor Law
   1. Davis-Bacon Act
   2. Fair Labor Standards Act
   3. Norris-LaGuardia Act
   4. National Labor Relations Act
   5. Labor-Management Relations Act (Taft-Hartley Act)
   6. Doctrine of Separate Gates
   7. Minority Goals

III. WORKING RELATIONSHIPS

A. Team building Skills
   1. Leadership Qualities
   2. Team Strengths and Weakness
   3. Communication and Listening Skills
   4. Minimize Interpersonal Conflict
   5. Coaching skills

B. Presentation and Facilitation Skills
   1. Meeting Preparation
   2. Meeting Leadership Skills
   3. Roberts Rules of Order
   4. Meeting Documentation

C. Problem Solving and Negotiation Skills
   1. Problem Identification/Root Causes
2. Problem Solving Methods
3. Dispute Resolution Skills

IV. CONSTRUCTION START-UP & SUPPORT

A. Job Site Set-up
   1. Field office(s)
   2. Material receiving, storage, truck routes, lay down and staging areas
   3. Temporary facilities

B. Site Procedures
   1. Field Documentation Procedures
   2. Public Relations
   3. Submittal Schedule and Procedures
   4. Quality Control Procedures
   5. Sustainability Considerations

V. CONSTRUCTION RESOURCE MANAGEMENT

A. Project Progress
   1. Submittals
   2. Production Control

B. Material Control
   1. Design and Government Regulations
   2. Material Components and Unit Cost
   3. Procurement Process

C. Subcontractor Control
   1. Subcontractor Progress
   2. Subcontractor Coordination

D. Tools and Equipment Control
   1. Maintenance and Operation Records
   2. Equipment Production
   3. Operator Qualifications

E. Personnel Control
   1. Qualifications Evaluation
   2. Performance Evaluation
   3. Training
VI. CONSTRUCTION COST CONTROL

A. Cost Comparison and Forecasting
   1. Budgets and Cost Breakdown Structure
   2. Productivity Rates and Earned Work hours
   3. Forecast Costs at Completion

B. Changes and Claims Impact
   1. Changes and Cost Impact
   2. Crashing and Schedule Impact

C. Contract Interpretation
   1. Changes
   2. Notification

D. Progress Payment Terms
   1. Subcontractor and Vendor Evaluation
   2. Partial Lien Releases
   3. Title/Ownership

E. Financial Statements
   1. Financial Calculations and Ratios

VII. PROJECT CLOSEOUT

A. Closeout Process
   1. Punch Lists
   2. Substantial Completion
   3. Final Completion
   4. Occupancy
   5. Commissioning Start-up and Owner Personnel Training
   6. Demobilize Site

B. Claims Closeout Procedures
   1. Resolution

C. Documentation Turnover
   1. Warranty Protocol
   2. Owner and Operating Manuals
   3. Project Record Documents (As Builts)

D. Final Payment Procedures
   1. Retainage
2. Lien Releases
3. Final Draw

VIII. CONSTRUCTION RISK MANAGEMENT

A. Risk Assessment
   1. Accident and Injury Statistics and Costs
   2. Project Uncertainty and Risk Allocation
   3. Loss Ratio and Risk

B. Workers Compensation Costs and Liability
   1. Workers Compensation and Experience Modification Rating
   2. Criminal Liability and Due Diligence
   3. Project Management Safety Liability

C. Safety Process and Culture
   1. Behavior-Based Safety
   2. Safety Management Techniques
   3. Safety Orientation
   4. Pre-task Safety Planning
   5. Workplace Focused Safety (Drugs)

D. Safety Procedures and Documentation
   1. General Duty Clause
   2. Multi-employer Work Sites
   3. Written Documentation Requirements
   4. Confined Space Requirements
   5. Scaffolds
   6. Lock-out, Tag-out Requirements
   7. Hazardous Communication and MSDS
   8. Fall Protection and PPE
   9. Excavation

IX. ETHICS

A. Business Ethics
   1. Bidding, Procurement and General Public/Media
   2. Reputation and Confidentiality

B. Professional Practice Ethics
   1. Constructor Code of Conduct