



CONSTRUCTION OPERATION

TECHNICAL-PROFESSIONAL

Grade 12

Three-Term Budget Of Work (BOW)
for Learning Competencies

**TECHNICAL-PROFESSIONAL
CONSTRUCTION AND BUILDING TECHNOLOGIES
Grade 12**

**Three-Term Budget Of Work
For Learning Competencies**

Please note that each Tech-Pro elective is completed in one term if delivered at Grade 12.

Elective	Construction Operation	
Prerequisite	None	
Content Standard	Demonstrate an understanding of concepts and principles in masonry.	
Performance Standard	The learners perform masonry works based on industry and safety standards.	
Week	Learning Competency	Suggested Activities
1	Discuss overview in masonry.	Masonry 360°: Exploring the Foundations of the Trade - This activity allows learners to explore the complete overview of masonry, including its definition, scope of work, materials, tools, safety practices, and career opportunities—through collaborative research and guided sharing, helping them understand masonry as both a technical skill and a profession in the construction industry. - Divide the class into small groups,

Week	Learning Competency	Suggested Activities
		assign each group a key aspect of masonry to research and present, then synthesize their outputs into a comprehensive class discussion on the overall scope of masonry. Project Preview: Understanding Masonry Before Construction - This activity engages learners in analyzing a simple masonry project scenario to identify required materials, tools, basic procedures, and safety considerations, enabling them to grasp the practical workflow and real-world application of masonry work. - Present a simple masonry project scenario and have student teams outline the materials, tools, steps, and safety measures involved, followed by a brief class presentation and discussion.
	Discuss masonry materials, tools and equipment.	Masonry Identification Challenge: Know It Before You Use It - This activity allows learners to examine, classify, and describe common masonry materials (e.g.,

Week	Learning Competency	Suggested Activities
		cement, sand, CHB, gravel), tools (e.g., trowel, level bar, plumb bob), and equipment (e.g., concrete mixer), helping them understand their functions, proper handling, and importance in construction work. ○ Prepare actual samples or images of masonry materials, tools, and equipment, then let learners rotate in groups to identify each item and explain its name, function, and proper use before presenting their findings to the class. ● Masonry Toolbox Mapping: Matching Materials to Purpose ○ This activity engages learners in analyzing how specific masonry materials, tools, and equipment work together in completing a construction task, strengthening their understanding of selection, function, and workplace safety. ○ Provide a simple masonry task scenario and have student groups create a chart matching the appropriate materials, tools, and equipment needed, including their specific functions, followed by a brief

Week	Learning Competency	Suggested Activities
		class discussion.
	Perform procedure in site preparations.	Site Ready Simulation: Preparing the Ground for Construction - This activity immerses learners in a simulated construction setup where they practice actual site preparation procedures such as clearing the area, checking levels, setting up batter boards, marking layout lines, and observing safety protocols. It develops their understanding of the correct sequence and importance of proper site preparation before masonry work begins. - Assign learner teams to a designated practice area and guide them to perform clearing, measuring, marking, and leveling procedures following proper safety and step-by-step site preparation standards. Layout and Leveling Workshop: Precision Before Construction - This hands-on activity focuses on developing learners' skills in site layouting and leveling using basic masonry tools such as tape measure,

Week	Learning Competency	Suggested Activities
		string line, plumb bob, and level bar, emphasizing accuracy, teamwork, and adherence to standard preparation procedures. ○ Provide a simple floor plan or measurement guide and have learners mark and level a mock construction site using appropriate tools while demonstrating correct procedural steps and safety practices.
2	● Perform procedure in excavation for foundation works.	● Foundation Dig Simulation: Excavation in Action ○ This hands-on activity allows learners to perform the step-by-step procedures in excavation for foundation works, including site marking, measuring dimensions, observing proper depth and width, ensuring alignment, and practicing safety precautions. It strengthens their understanding of accuracy, teamwork, and the importance of proper excavation as the base of structural stability. ○ Provide a scaled foundation layout and have student teams measure,

Week	Learning Competency	Suggested Activities
		mark, and excavate a designated practice area following correct procedures, dimensions, and safety standards. • Excavation Process Drill: From Layout to Inspection ○ This structured activity focuses on mastering the correct sequence of excavation procedures—layout verification, ground breaking, soil removal, checking depth and levelness, and final inspection—while reinforcing tool handling skills and workplace safety practices. ○ Organize learners into work groups and assign them to execute and demonstrate each stage of the excavation process in sequence, with peer and teacher evaluation based on accuracy, procedure, and safety compliance.
3	• Perform procedures in formworks preparation.	• Formworks Assembly Workshop: Building the Mold for Concrete ○ This hands-on activity engages learners in preparing and assembling basic wooden formworks for a small

Week	Learning Competency	Suggested Activities
		concrete structure (e.g., footing or column), emphasizing correct measurement, cutting, alignment, bracing, fastening, and safety practices to ensure structural accuracy and stability before concrete pouring. ○ Provide a simple structural plan and guide learner teams to measure, cut, assemble, align, and brace formwork panels according to specifications while observing proper tool handling and safety procedures. ● Precision and Support Drill: Ensuring Strong and Stable Formworks ○ This activity focuses on mastering the step-by-step procedures in formworks preparation, including material inspection, layout marking, leveling, squaring, and installation of supports and braces to prevent deformation during concrete placement. ○ Assign learners to prepare and install formworks in a designated area, ensuring correct dimensions, squareness, leveling, and secure bracing, followed by a guided inspection and evaluation.

Week	Learning Competency	Suggested Activities
	Perform procedures in re-bars preparation.	Rebar Cutting and Bending Workshop: Shaping Structural Strength - This hands-on activity develops learners' skills in measuring, marking, cutting, and bending reinforcing bars (re-bars) according to specified dimensions and shapes based on a simple structural plan. It emphasizes accuracy, proper use of cutting and bending tools, and adherence to safety procedures to ensure structural integrity and correct reinforcement placement. - Provide a basic reinforcement plan and guide student teams to measure, mark, cut, and bend re-bars according to specifications while strictly observing proper tool handling and safety practices. Reinforcement Layout Simulation: Preparing Rebars for Installation - This activity focuses on preparing and arranging re-bars for footing, column, or beam reinforcement by practicing correct spacing, tying techniques, alignment, and inspection standards to ensure readiness for concrete pouring.

Week	Learning Competency	Suggested Activities
		Assign learners to assemble and tie prepared re-bars into a required reinforcement configuration based on a given layout plan, followed by teacher inspection for accuracy, spacing, and stability.
4	Perform procedures in scaffoldings preparation.	Scaffold Assembly Simulation: Building Safe Work Platforms - This hands-on activity allows learners to practice the correct procedures in preparing and assembling scaffoldings, including site inspection, base preparation, proper positioning, securing frames, installing platforms, and observing safety standards. It emphasizes structural stability, correct sequencing, teamwork, and strict compliance with safety protocols. - Guide student teams to assemble a basic scaffold setup in a designated area following standard step-by-step procedures and safety checks, then conduct a stability and safety inspection. Scaffold Safety and Stability Drill:

Week	Learning Competency	Suggested Activities
		Inspect Before You Work ○ This activity develops learners' competence in inspecting, adjusting, and ensuring scaffold stability before use, focusing on leveling, bracing, guardrails installation, load considerations, and hazard identification to prevent workplace accidents. ○ Assign learners to prepare and inspect a scaffold structure using a safety checklist, ensuring correct assembly, alignment, secure connections, and compliance with safety requirements before simulated use.

Suggested Performance Tasks	• Individual Performance Task: Wall Section Construction ○ This individual task assesses a learner's ability to perform masonry work independently, including proper mortar mixing, block/brick laying, leveling, alignment, joint finishing, and adherence to safety protocols, demonstrating precision and competency in a controlled setting. ○ Provide each learner with a small wall layout and materials, then have them construct the wall section individually while following correct masonry techniques, alignment, leveling, and safety standards. • Group Performance Task: Team Masonry Project ○ This group task evaluates collaborative skills in masonry work, requiring learners to plan, organize, and execute a larger masonry project (e.g., short wall or planter box) while applying proper techniques, workflow coordination, and strict safety standards. ○ Divide learners into teams and assign a group masonry project, then guide them to coordinate tasks, prepare materials, lay bricks/blocks, and finish the structure safely and according to industry standards.
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Content Standard	Demonstrate an understanding of concepts and principles in performing masonry works.
Performance Standard	The learners perform masonry works based on industry and safety standards.

Week	Learning Competency	Suggested Activities
4	• Perform procedures in preparing concrete for pouring.	• Concrete Mixing Practicum: From Proportioning to Proper Consistency ○ This hands-on activity allows learners

Week	Learning Competency	Suggested Activities
		to perform the correct procedures in preparing concrete, including identifying materials (cement, sand, gravel, water), observing proper mix proportions, dry and wet mixing techniques, checking workability, and applying safety practices. It develops accuracy, teamwork, and understanding of how proper concrete preparation affects structural strength. ○ Provide the required materials and mix ratio, then guide student teams to measure, mix, and test the consistency of concrete following correct procedures and safety standards. ● Concrete Preparation Drill: Quality Before Pouring ○ This structured activity focuses on mastering the step-by-step process of preparing concrete for pouring, including site readiness, material inspection, proper batching, mixing sequence, and evaluating workability to ensure quality and durability before placement. ○ Assign learners to prepare a concrete

Week	Learning Competency	Suggested Activities
		mix based on a given specification and evaluate its readiness for pouring through teacher-supervised inspection and discussion.
5	Perform procedures in backfilling and compaction.	Backfill Basics: Filling and Leveling Foundations - This hands-on activity allows learners to perform the proper procedures in backfilling, including placing soil or aggregate into excavated areas around foundations, layering, leveling, and preparing for compaction. It emphasizes accuracy, sequence, and understanding how proper backfilling supports structural stability. - Guide student teams to place and evenly layer backfill material around a mock foundation, ensuring proper leveling and following safety procedures. Compaction Drill: Ensuring Strong and Stable Ground - This activity focuses on mastering compaction techniques using manual or mechanical methods to consolidate soil or aggregate, prevent settlement,

Week	Learning Competency	Suggested Activities
		and maintain stability for structural loads. Learners learn proper technique, tool use, and safety precautions. ○ Assign learners to compact each backfilled layer using tampers or mechanical compactors, ensuring uniform density, level surface, and adherence to safety standards.
6	• Perform procedures in laying block/ bricks.	• Bricklaying Fundamentals: Building the First Wall ○ This hands-on activity introduces learners to the proper techniques in laying bricks or concrete hollow blocks (CHB), including mixing mortar, spreading it evenly, placing units, checking alignment, leveling, jointing, and observing safety practices. It develops accuracy, attention to detail, and teamwork for quality masonry work. ○ Provide a simple wall layout and guide student teams to prepare mortar and lay bricks/blocks sequentially while ensuring correct alignment, leveling, and joint finishing under supervision.

Week	Learning Competency	Suggested Activities
		• Wall Construction Drill: Precision and Quality in Blocklaying ○ This activity focuses on performing complete block/brick laying procedures, emphasizing consistent spacing, vertical and horizontal alignment, bond patterns, and finishing, while reinforcing proper tool handling and workplace safety. ○ Assign learners to construct a small wall section following a given plan, ensuring proper mortar application, alignment, jointing, and adherence to safety standards, with teacher evaluation for quality and technique.
7	• Perform procedures in plastering concrete surfaces.	• Surface Preparation and Plastering Basics ○ This activity introduces learners to the proper procedures for plastering concrete surfaces, including surface cleaning, wetting, applying scratch and brown coats, smoothing, and finishing, emphasizing accuracy, texture, and adherence to safety practices. ○ Guide student teams to clean and wet

Week	Learning Competency	Suggested Activities
		a concrete surface, then apply and level the plaster layers using trowels, ensuring smoothness, even thickness, and proper finishing techniques. • Precision Plastering Drill: Finishing for Strength and Aesthetics ○ This hands-on activity focuses on mastering the step-by-step plastering process on small wall panels or mock surfaces, including mixing plaster to the correct consistency, applying even coats, and achieving uniform texture and proper curing. ○ Assign learners to prepare plaster mix and apply it to a designated wall section, checking for even coating, smooth finish, correct thickness, and compliance with safety procedures.
8	• Perform pre-cast balusters and handrails installation.	• Pre-Cast Baluster Placement Workshop ○ This hands-on activity allows learners to practice installing pre-cast balusters, including measuring spacing, preparing the base, leveling, securing the balusters, and checking alignment to ensure structural stability and aesthetic consistency.

Week	Learning Competency	Suggested Activities
		○ Guide student teams to mark the layout, position, level, and secure pre-cast balusters along a railing line, ensuring correct spacing, alignment, and safety compliance. ● Handrail Installation Drill: Aligning and Securing Safety Rails ○ This activity focuses on attaching handrails to pre-cast balusters, emphasizing accurate measurement, leveling, fastening, and finishing, while ensuring both functional safety and visual appeal. ○ Assign learners to measure, cut (if needed), level, and fasten handrails onto pre-cast balusters, verifying stability, alignment, and adherence to safety procedures.

Suggested Performance Tasks	• Individual Performance Task: Brick/Block Wall Construction ○ This task assesses an individual learner's ability to perform masonry work independently, including proper mortar mixing, brick or concrete hollow block (CHB) laying, checking alignment and level, finishing joints, and observing safety protocols. ○ Provide each learner with a wall layout and materials, then have them construct a section of wall individually while ensuring correct techniques, alignment, leveling, and adherence to safety standards. • Group Performance Task: Collaborative Masonry Structure ○ This task evaluates a team's ability to plan and execute a masonry project together, such as building a short wall, planter box, or column, emphasizing coordination, proper tool use, workflow management, and compliance with industry and safety standards. ○ Divide learners into small teams and assign a masonry project, then have them collaborate to prepare materials, lay bricks/blocks, finish joints, and complete the structure safely according to industry standards.
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Content Standard	Demonstrate an understanding of concepts and principles in performing plumbing works.
Performance Standard	The learners perform plumbing works based on industry and safety standards.

Week	Learning Competency	Suggested Activities
8	• Prepare common plumbing materials, tools and equipment for installation.	• Plumbing Workshop Materials Identification

Week	Learning Competency	Suggested Activities
		○ This activity introduces learners to common plumbing materials (pipes, fittings, valves, seals) and their purposes, helping them understand how to select the correct items for installation tasks. ○ Provide actual plumbing materials or images and have learners identify, classify, and explain the function of each item in preparation for installation. ● Plumbing Tools and Equipment Familiarization Drill ○ This hands-on activity develops learners' knowledge of essential plumbing tools and equipment (pipe cutters, wrenches, plungers, soldering kits), emphasizing proper handling, safety, and readiness for installation work. ○ Assign learners to inspect, handle, and demonstrate the correct use of plumbing tools and equipment while observing proper safety procedures.
9	● Perform plumbing installation based on lay-out plan.	● Pipe Routing and Fitting Workshop ○ This hands-on activity allows learners

Week	Learning Competency	Suggested Activities
		to practice installing plumbing pipes and fittings according to a given layout plan, emphasizing accuracy, proper alignment, connection techniques, and adherence to safety and building standards. ○ Provide a plumbing layout plan and guide learners to measure, cut, assemble, and align pipes and fittings according to the plan while ensuring secure connections and compliance with safety practices. ● Functional Plumbing Installation Drill ○ This activity focuses on performing a complete plumbing installation, including positioning fixtures, connecting supply and drainage lines, testing for leaks, and ensuring the system functions as intended based on the layout plan. ○ Assign learners to follow a layout plan to install plumbing lines and fixtures, then conduct a water flow and leak test to verify correct installation and proper functionality.
	● Perform piping joints and connections based on job specifications.	● Pipe Joint Assembly Workshop

Week	Learning Competency	Suggested Activities
		○ This hands-on activity allows learners to practice various types of piping joints—such as threaded, welded, solvent-cemented, and flanged connections—ensuring they understand proper alignment, sealing techniques, and compliance with job specifications. ○ Provide different pipe types and fittings, then guide learners to assemble joints according to specified connection methods while ensuring proper alignment, sealing, and safety practices. ● Piping Connection Accuracy Drill ○ This activity focuses on performing precise piping connections for a simulated plumbing system, emphasizing correct measurement, fitting selection, tightening, leak-proofing, and adherence to specifications. ○ Assign learners to connect pipes and fittings according to a given layout plan and job specification, then check for alignment, secure joints, and leak-free performance.

Suggested Performance Tasks	Individual Performance Task: Fixture Installation - This task assesses a learner's ability to install a plumbing fixture (e.g., faucet, sink, or toilet) independently, including proper measurement, pipe connection, sealing, alignment, and adherence to safety and industry standards. - Provide each learner with a plumbing fixture and materials, then have them install it individually following correct procedures, proper pipe connections, and safety practices. Group Performance Task: Residential Plumbing Layout Installation - This task evaluates a team's ability to install a complete plumbing layout for a small-scale project, including supply and drainage lines, fixture connections, leak testing, and safe use of tools, emphasizing teamwork, accuracy, and compliance with industry standards. - Divide learners into small teams and assign a residential plumbing layout, then have them collaborate to install pipes and fixtures, test for leaks, and ensure adherence to safety and industry standards.
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Content Standard	Demonstrate an understanding of concepts and principles in basic construction management.
Performance Standard	The learners perform project cost and estimates for basic construction services.

Week	Learning Competency	Suggested Activities
10	Discuss the basic concept of construction management	Construction Management Overview Workshop

Week	Learning Competency	Suggested Activities
		○ This activity introduces learners to the key concepts of construction management, including project planning, scheduling, budgeting, resource allocation, safety, and quality control, helping them understand how construction projects are effectively organized and executed. ○ Divide learners into small groups to research and present different aspects of construction management, followed by a class discussion synthesizing their findings into a comprehensive overview. ● Project Planning Simulation: Applying Construction Management Principles ○ This activity engages learners in a simulated construction project where they apply basic construction management concepts, such as sequencing tasks, assigning responsibilities, and estimating timelines and resources, to reinforce understanding of real-world project organization. ○ Provide a sample construction scenario and have learners create a simple project plan with task sequencing,

Week	Learning Competency	Suggested Activities
		assigned roles, and timelines, then discuss how effective management impacts project success.
	Perform basic project cost and estimates for construction services.	Construction Cost Estimation Workshop - This activity introduces learners to estimating basic construction costs by analyzing materials, labor, equipment, and overheads, helping them understand how to prepare a simple project budget for small-scale construction tasks. - Provide learners with a sample project plan and list of materials, then guide them to calculate material costs, labor rates, and total project estimate following standard computation methods. Project Budget Simulation Drill - This activity engages learners in preparing a mock construction budget and cost estimate, including quantities, unit costs, and total expenses, reinforcing practical skills in financial planning for construction projects. - Assign learners a small-scale

Week	Learning Competency	Suggested Activities
		construction scenario and have them create a detailed cost estimate sheet covering materials, labor, and equipment while checking for accuracy and completeness.
	Simulate basic cost and estimates for basic construction projects.	Mini Project Cost Simulation - This activity allows learners to simulate preparing a cost estimate for a small-scale construction project, including calculating material quantities, labor costs, and basic overhead, helping them understand how estimates guide project planning and budgeting. - Provide learners with a simple construction project plan and materials list, then have them calculate total costs, including labor and materials, to create a complete project estimate. Construction Budget Role-Play Drill - This activity engages learners in a simulated project scenario where they take on roles (project manager, estimator, supplier) to prepare and justify a basic project budget, promoting critical thinking and practical application of cost estimation

Week	Learning Competency	Suggested Activities
		principles. Assign learners project roles and have them collaboratively simulate calculating and presenting a project budget, including materials, labor, and minor contingencies, based on a given construction scenario.
Suggested Performance Tasks	Individual Performance Task: Basic Cost Estimation of a Small Project - This task assesses a learner's ability to calculate the cost of a simple construction project, including materials, labor, and minor overheads, applying standard estimation methods and ensuring accuracy in computations. - Provide each learner with a small-scale construction project plan and materials list, then have them individually compute quantities, unit costs, and total project cost following proper estimation procedures. Group Performance Task: Collaborative Construction Budget Simulation - This task evaluates a team's ability to prepare a complete project estimate for a basic construction task, involving collaboration to calculate material requirements, labor costs, equipment needs, and contingencies while ensuring realistic and accurate budgeting. - Divide learners into groups, assign a small construction project scenario, and have them collaboratively prepare a detailed cost estimate and budget sheet, then present and justify their calculations to the class.	