



CONSTRUCTION INDUSTRY SKILLS PRIORITIZATION

FEEDBACK REPORT 2021



Feedback Report: Construction Industry Skills Prioritization

(Conducted on August 3, 2021 via Zoom Conference)

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I. Background

Construction in the country is in its prime years today with its rapid and continuous growth. Having such notable success, it is expected to continue playing its vital role in advancing the country's forecasted economic growth and will be in the limelight following the government's aggressive commitment to approve and implement complex infrastructure projects.

This industry is among the top 10 Key Employment Generators (KEGs) that has the potential to generate employment and contribute to the Philippine economy. In 2018, the construction industry had a total of Php2.3 trillion in Gross Value and contributed a total of Php1.3 trillion in Gross Profit for the economy. In terms of employment, the sector had a 9.4% share and employed 4 million workers out of the 41.3 million according to the 2018 Labor Force Survey released by the Philippine Statistics Authority.

TESDA as the authority in technical education and skills development in the Philippines ensures to address the needs of the industries in the development of its programs and standards. After receiving various requests for the construction sector, TESDA, with DPWH, Construction Industry Authority of the Philippines, DTI, DOLE, NEDA, and the industry will work together to assess the current and future skills needs as well as initiate training programs to develop skills requirements needed by the sector.

II. Objectives

The consultation intends to collect information on the current situation of the Construction sector in order to determine the necessary training related support and programs for the sector. Specifically, it intends to:

1. Determine the challenges and opportunities in Construction;
2. Present and validate the skills map for Construction; and
3. Determine the priority skills requirements for the sector.

III. Attendees

The following organizations/agencies served as participants and observers for the industry consultation:

Representatives and Industry Associations/Partners from:

- Philippine Constructors Association Inc. (PCA)
- Association of Carriers & Equipment Lessors, Inc. (ACEL)
- Lift Asia Elevator and Escalator Techno Services Corporation



- Monark Foundation Inc.
- Concepcion Otis Philippines Incorporated
- BAUER Foundations Philippines
- Philippine Water Works Association
- Philippine Institute of Certified Quantity Surveyors, Inc. (PICQS)

Representatives from the following Government Agencies:

- DOLE - Bureau of Local Employment
- DTI - Construction Industry Authority of the Philippines
- National Economic and Development Authority
- Department of Public Works and Highways
- TESDA QSO - Qualifications and Standards Office

Observers from the following Regional and Provincial Offices:

- Regional Operations Division Chief of TESDA IX
- Regional Operations Division Chief of TESDA Region X
- Acting Regional Director of TESDA Region IV-B
- Acting Provincial Director of TESDA Camiguin
- Provincial Directors from TESDA Bukidnon, TESDA Lanao del Norte, TESDA Misamis Oriental, TESDA Misamis Occidental, TESDA La Union, TESDA Ilocos Norte, TESDA Romblon, and TESDA Iloilo
- TESDA Pangasinan School of Arts and Trades
- TESDA Pangasinan Technological Institute
- Provincial Training Center Carmen
- TESDA Region VII

IV. Highlights of the Result

4.1. Presentation of the Industry Situationer

The construction industry is an integral component of the Philippine economy, generating around 336 billion Philippine pesos in gross value added in the fourth quarter of 2020 (Figure 1). In terms of capital formation, which refers to overall building expenditures by private and public businesses, the sector suffered major contractions in 2020, due mainly to the global coronavirus (COVID-19) pandemic.

Already reeling from the effects of COVID-19, the surging Delta Variant will make it more challenging, resulting in construction project delays and cancellations for both residential and non-residential. Specifically, Philippine Constructors Association (PCA) mentioned in the industry situationer that 74% of the sector are finding it difficult to fill up their required workforce. Wherein, 57% said that what they lack most are skilled workers and 49% said that "Quarantine Protocols" are preventing them from filling their requirements. Right now, 43% of



the workers have returned to the provinces and have not returned (PCA Survey for H1 2021). As a result, the majority of construction workers have been displaced or have lost their jobs permanently, causing the country's present employment situation to deteriorate. To help with recovery efforts, the government is now asking construction companies to look outside the domestic market and look for prospects abroad.

Similarly, the COVID-19 pandemic's lockdown limitations had a significant impact on the Philippine government's biggest infrastructure project, the "Build Build Build" program. The program was launched in response to the administration's desire to help the country achieve a better developed and connected living for Filipinos while also creating new jobs. However, according to official data, only a few projects were completed in 2021, and 31 more are expected to be completed in 2022.

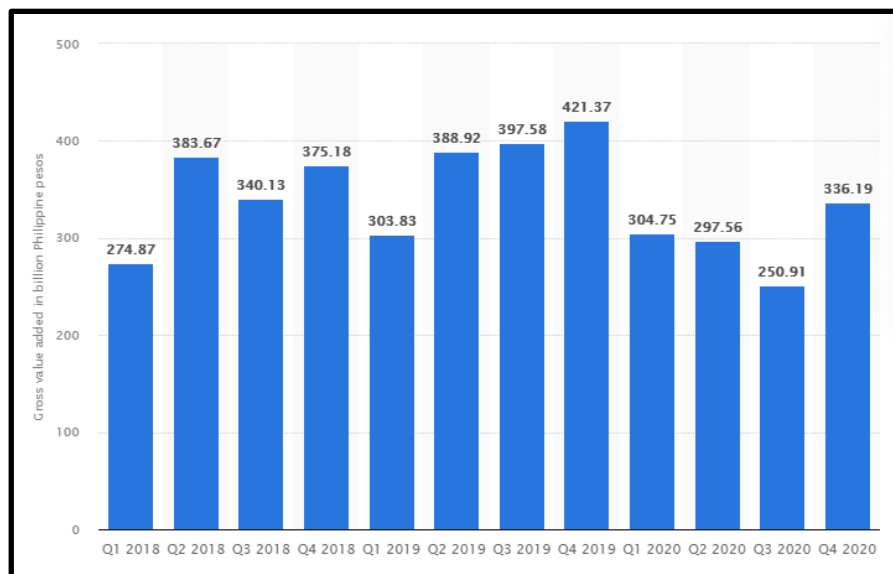


Figure 1. Construction sector's gross value added in the Philippines from the first quarter of 2018 to the fourth quarter of 2020 (Source: Statista 2021).

It was also highlighted in the consultation that beyond the pandemic, future plans of the construction industry (figure 2) must be systematically analyzed and prepared with the help of the government and other sectors.



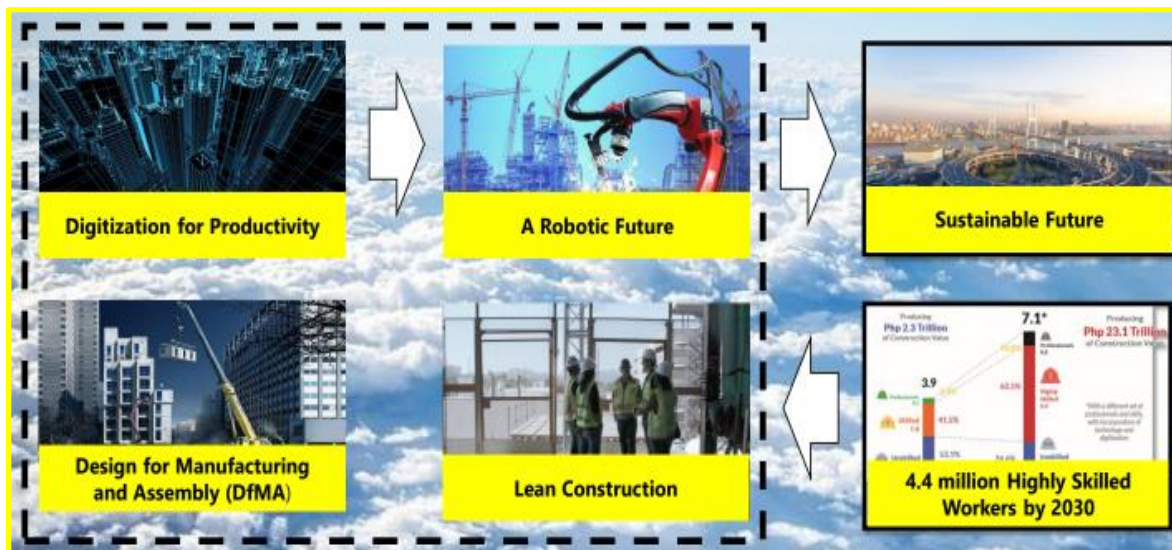


Figure 2. Future plans framework for the Construction Sector in a common data environment. (Source: PCA - Industry Situationer).

In line with this, the responsibility resulting from the prioritization of infrastructure development in the country does not solely lie on the construction sector alone; but is stretched out to different sectors - one of which is education.

With aggressive plans to boost infrastructure building- and thereafter use this as leverage for national economic development- the education sector must undertake thoughtful interventions. These interventions include equipping the people with necessary knowledge and skills (figure 3) in the delivery of construction services especially when it comes to digitization for productivity. Labor-intensive work like construction activities require practical skills.



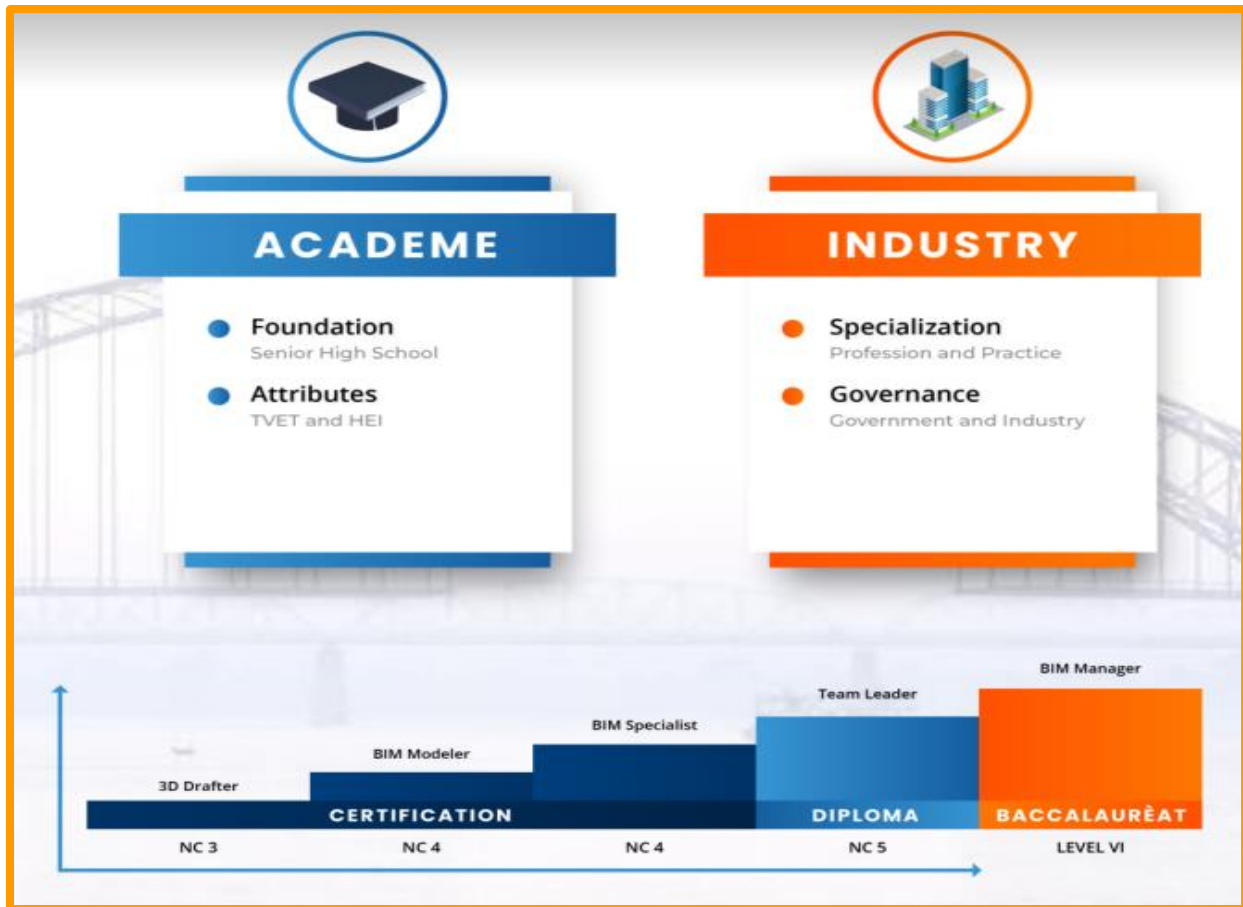


Figure 3. Philippine Qualifications Framework (Source: PCA - Industry Situationer).

4.2. Challenges and Opportunities

Based on the discussions made during the Industry Consultation on Skills Requirements on the Construction Sector, the following were the challenges and opportunities currently faced by them, as described by the resource speakers. These were divided into several Aspects: Economic, Employment, Education, and Others.

While there are challenges in different aspects listed here, TESDA can only address the challenges that are under its mandate, specifically the one that relates to the low level of competency of construction workers, particularly for workers whose prerequisite or requirement is equivalent to a TVET program. Whereas, the other Education concerns can be addressed by the PCA in collaboration with the agency mandated under higher education.



Other concerns/challenges that can be addressed by other agencies, such as those specific to PCA in terms of policy, can be brought to the attention of PCA's governing board.

Table 1. Summary of Challenges and Opportunities.

Areas	Challenges	Opportunities
Economic	Rising cost of materials (highly irregular) and slow turnover	
	Recovery of costs or claiming for the escalation of prices from the principals/Shrinking profit margins	Construction Roadmap of the Philippines 2020 - 2030
	Pessimistic suppliers	
	Long payment cycle of clients	Infrastructure for growth and development
	Covid-19 pandemic, IATF protocols (less efficiency)	Construction backlogs/New constructions (MPB/DPWH projects, FMR projects, Private clients)
	Delay in delivery of goods and services and project delays	
	<ul style="list-style-type: none"> ● Sales growth ● Increased unemployment 	<ul style="list-style-type: none"> ● Ample government projects that can be an option considering the execution of projects in time for the election year ● To learn techniques and expertise of economies for construction ● Build, Build, Build Program ● Quantity Surveying Career option ● Inter telecom industry (Ex. pipe laying of fiber optics, construction of civil communication towers)
	Technology adoption	Provide more business opportunities
	Foreign contractor competition	Various mega projects in the Middle East
	Incompetence in the profession leading to rising cost of variations and dispute	
High exchange rates		
Employment	Lack of competencies and trainings in the profession	High demand in Quantity Surveyors locally and abroad as well as opportunities for cost planners, digital measurers, contract administrator, and health science



Areas	Challenges	Opportunities
		Demand for certified skilled workers (i.e. HE mechanic) More demand for skilled /specialized works (more workforce needed)
	Accreditations has limited assessment and availability (also due to pandemic)	
	<ul style="list-style-type: none"> • Lack of skilled workers • Shortage in skills of a Quantity Surveyor/Demand for Quantity Surveyor • Old employees' resistance to change (i.e. slow technology adoption) 	<ul style="list-style-type: none"> • Education and training • Position opening
	Aging workforce	
	High attrition rate	
	Salaries and benefits not industry competitive	
	Low productivity	
	Slow movement of workers due to strict safety protocols	Opportunistic surge of manpower coming from companies that are downsizing
	New employees or fresh graduate's workplace attitude/behavioral aspects (ex. impatient, hard to keep for long term employment)	<ul style="list-style-type: none"> • Preparedness of the K-12 graduates to enter the profession in Quantity • Cleanse the org from underperforming personnel
	SOP in safety & security has been changed, more PPE's	
		Fast hiring process
Education	Training fees	Enrollment to TESDA trainings and other trainings
	Time constraint in training (i.e. Delayed in compliance training, conflict to work schedule)	
	Lack of knowledge in the importance of new innovations	
	Less training courses offered due to limited slot / Lack of Training and seminars	
	Mostly virtual trainings due to strict safety protocols	
	<ul style="list-style-type: none"> • Education not fit to current position (qualification mismatch) • No NC certificate 	<ul style="list-style-type: none"> • Update on training for skilled workers (reskilling) • Acquire National Certification related to field



Areas	Challenges	Opportunities
		<ul style="list-style-type: none"> • Online education is quite accessible and abundant (i.e. free webinars and literature) • Multi-skilled workers
	Lack of soft skills (i.e management skills), technical skills (workplace application) for fresh graduates	Actual day to day application of skills
	Lack of the right training in quantity surveying	Upskilling of Engineers to learn the right QS competencies
	No Diploma course in Quantity Surveying for the K-12 graduates	Creating a Diploma in Quantity Surveying in partnership with PCA and TESDA through PICQS
	Adaptability in 5D BIM (3D to 7D; discussion for 8D) and digital measurement and Data Analytics	Modernization of the QS profession by integrating 5D BIM and Data Analytics
	Lack of training courses for new technology (BIM/Estimating tools, etc.)	
	Minimal access to digital technology for communication & coordination	Project management
	Upgrade of software/digital tools	
Others	Money	Projects
	Sales	<ul style="list-style-type: none"> • More clients • Project delays
	Work professionalism	
	Work environment	Safety and health management
	Behavioral aspects of workers	
	Aging skilled workers	
	Work Location for some employees only	
	Lack of recognition from the government that Quantity Surveying is an important profession	

Alongside the risky business as caused by the COVID-19 pandemic and the various health and safety protocols in place, skilled workforce shortage and acceleration of digitization and other technology are among the trends and challenges that the Construction sector faced in 2021. For instance, although there is a large number of employed workers, skills mismatch exists, making it difficult to fill the needed positions.



Further, to oppose the effects of the pandemic and the observed slacking of private investments and constructions after the elections period, the PCA is advocating for the 30-year Infrastructure Master Development Plan. However, the proposal is still pending in the Senate.

Other notable feedback includes the concerns raised for Building Information Modelling (BIM) and Quantity Surveying.

For BIM, there is a Competency Standard being offered for Basic 3D BIM Modelling Level III issued in 2020. Moreover, according to PCA, the Training Regulation being developed will cover 3D to 4D. However, the industry noted that BIM has different dimensions from 3D to 7D, and there are also on-going discussions for the 8th dimension. The 5D needed for Quantity Surveying is also an entirely different model.

Meanwhile, for the Quantity Surveying profession, the Chairperson of PICQS mentioned that there is a need to introduce Quantity Surveying especially to K12 graduates to prepare them for transferable skills from learning institutions/schools to the corporate world.

The PCA also clarified that contrary to what other agencies and organizations perceive, Quantity Surveyors are different from Geodetic and Civil Engineers. In fact, PICQS noted that the functions of a Civil Engineer may be delegated to a Quantity Surveyor, also addressing the long-standing problem of being overworked yet underpaid.

Additionally, as reflected in Table 1, some government agencies, for instance, the Professional Regulatory Commission, do not even consider Quantity Surveying as a profession. Further, in a Senate hearing for the Bill for Quantity Surveying sponsored by Senator Trillanes IV in 2017/2018, the Civil Engineering discipline is particularly having strong objections.

However, the lack of understanding and appreciation to the profession can be attributed to the lack of industry awareness. But following a series of actions from PCA and PICQS including the paid Masterclass Certificate in Quantity Surveying, the industry realized the importance of the occupation and the foreseen demand. Currently, there is no licensure program for Quantity Surveyor but there is an assessment of professional competency.

A project is said to have a minimum of at least one Quantity Surveyor and in some cases, a big project would have them as another team. PICQS also noted that the qualification leads to Construction Engineering Management, which provides an opportunity for the development of a Level 3 to Level 5 Diploma. This would open employment opportunities for K-12 graduates.



4.3. Skills Requirements

Technical Skills

The resource speakers were asked to validate the skills map of their industry. With the intensification of construction in the country comes the growing demand for workers who can deliver the services needed by the industry. Table 2 shows the validated skills map that summarizes the technical skills requirements of the Construction industry.

Table 2. Summary of the Technical Skills Requirements of the Construction Industry.

Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
Vertical Construction	Accounting Staff	S, L	M		
	Admin Assistant	L	L/M		
	Alimak Operators	S	M		
	Backhoe Operators	L	L/M	Scarcity of applicant due to other competition	Strengthen sourcing strategies
	Crane Operators (Mobile)	L	L/M		
	Crane Operators (Tower Cranes)	L	L/M		
	Dump Truck Drivers	L	M		
	Finishing Carpenters	L	M/H		
	Finishing Masons	L	M/H		
	Foreman	L	M		
	General Foremen	L	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Leadmen	L	M		
	Rough Carpenters	L	M/H		
	Service Vehicle Drivers	S	L/M		
	Transit Mixer Truck Drivers	L	M		
	Unskilled Workers (Laborers / Helpers)	L	M/H		
	Welders	L	M/H		
	Billing & Collection Staff	S, L	M		
	Boom Truck Drivers	L	M		
	Certified Scaffolders	L	M/H		
	Community Relations Officer	S, L	L/M		
	Compactors	L	M		
	Construction Manager	L	L/M	<ul style="list-style-type: none"> No qualified applicant Some Demand High Pay 	Strengthen sourcing strategies
	Project Manager	L	L/M		



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	Project Supervisors	L	L/M	<ul style="list-style-type: none"> No qualified applicant Some Demand High Pay 	Training
	Cost Planning & Control	S, L	M		
	Contract & Commercial Management Specialists	S	L/M		
	Cost Engineers	L	L		
	Document Controller	S, L	L/M		
	Drilling Rig Operators	L	M		
	Electricians	L	M/H		
	Elevator Installation Technician	L	M		
	Environment, Safety & Health Engineers/Officers	S	L/M	No qualified applicant and lack certifications	Strengthen sourcing strategies
	Equipment Dispatchers	S, L	L/M		
	Equipment Maintenance Supervisors	L	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Equipment Supervisors (Project Management)	S, L	L/M		
	Equipment Technicians	L	M		
	Equipment Tool Keepers	L	M		
	Erection Crew/Erectors	L	M/H		
	Field Engineers	L	L/M	Some qualified applicants have no License	<ul style="list-style-type: none"> • Strengthen sourcing strategies • Training
	Quantity Surveyors	S, L	L/M		
	Formworks Crew	L	M/H		
	Generator Set Tenders	L	M		
	Gondola Tenders	S	M		
	Grader Operators	L	M		
	Heavy Equipment Mechanic (Advance)	L	L	Qualified applicant may lack certification and experience	Strengthen sourcing strategies
	Riggers	L	M		
	Materials Engineer	L	L/M		
	HR Assistants / Timekeepers	L	L/M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Human Resource Staff	S, L	M		
	Liaison Staff	S, L	M		
	Logistics & Support Staff	S, L	M		
	Maintenance Technician	L	L/M		
	Master Electrician	L	M/H		
	Material Inventory Assistants / Warehouse	L	L/M		
	Materials Testing Technician	L	L/M		
	Millwright	L	M/H		
	Painters	L	M/H		
	Pipefitters	L	M/H		
	Plumbers	L	M/H		
	Pre Cast Masons/Skilled	L	M/H		
	Procurement & Materials Management Officer	S	L/M		
	Procurement Staff	S, L	M		
	Quality Control Supervisors/Engineers	L	L/M		



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	Safety Assistants	S	L/M		
	Sandblasting Crew	L	M/H		
	Scaffolders	L	M/H		
	Semi Skilled Workers	L	M/H		
	Site Accounting Assistant	L	L/M		
	Site HR Officers	L	L		
	Skid Loader Operators	S	M		
	Spotters	L	M		
	Stamping Machine Operators	S	M		
	Tender Planning & Estimating Staff	S, L	M		
	Tig/SMAW/ GTAW Welder	L	M/H		
	Tile Setters	L	M/H		
	Tinsmiths	L	M/H		
	Toolkeepers	L	L/M		
	Tower Light Tenders	L	M		



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	Treasury Staff	S, L	M		
	Water well drilling	L	M		
Horizontal Construction	Project Manager	S, L	L	<ul style="list-style-type: none"> Limited or No qualified applicant (Good ones are employed overseas) Some demand higher pay Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) Employee's lack of values (i.e wants instant gratification without 	<ul style="list-style-type: none"> Strengthen sourcing strategies Put emphasis on values education and formation when training people. Too much importance is given to technical skills, thus overlooking the important values aspect of an employee. Training and development seminars
	Construction Manager	S, L	L		
	Project Supervisors	S, L	L		
	Quality Control Supervisors/Engineers	L	L		
	Environment, Safety & Health Engineers/Officers	S, L	L		
	Quantity Surveyors	S, L	L		
	Cost Engineers	S, L	L		
	Material Inventory Assistants / Warehouse	L	L		
	Procurement & Materials Management Officer	S	L		
	Toolkeepers	L	L		
	Site HR Officers	L	L		
	Document Controller	L	L		
	Site Accounting Assistant	L	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Scaffolders	S, L	L/H	proving worth of the function) <ul style="list-style-type: none"> • Work schedule 	
	Welders	S, L	L/H		
	Plumbers	S, L	L/H		
	Painters	S, L	L/H		
	Electricians	S, L	L/H		
	Finishing Masons	S, L	L/H		
	Tile Setters	S, L	L/H		
	Equipment Supervisors (Project Management)	S, L	L		
	Maintenance Technician	S, L	L		
	Materials Engineer	S			
	Contract & Commercial Management Specialists	S	L		
	Master Electrician	S, L	L/H		
	Millwright	S, L	L/H		
	Tig/SMAW/ GTAW Welder	S	L/H		
	Certified Scaffolders	S	L/H		



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	Erection Crew/Erectors	S	L/H		
	PreCast Masons/Skilled	S	L/H		
	Sandblasting Crew	S	L/H		
	Formworks Crew	S	L/H		
	Backhoe Operators	S, L	L/H		
	Compactors	S, L	L/H		
	Generator Set Tenders	S, L	M		
	Equipment Dispatchers	S, L	L/M		
	Alimak Operators	S			
	Gondola Tenders	S	L		
	Boom Truck Drivers	L	M		
	Equipment Maintenance Supervisors	L	M		
	Equipment Tool Keepers	L	M		
	Drilling Rig Operators	L	L		
	Skid Loader Operators	S	L		
Treasury Staff	L	L			



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	Billing & Collection Staff	L	L		
	Liaison Staff	L	L		
	Cost Planning & Control	L	L		
	Tender Planning & Estimating Staff	L	L		
	Logistics & Support Staff	L	L		
	Procurement Staff	L	L		
	Stamping Machine Operators	S	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Semi Skilled Workers	S, L	L/H	<ul style="list-style-type: none"> • Some qualified applicants have no License • Limited or No qualified applicant (Good ones are employed overseas) • Seek Higher pay • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) • Employee's lack of values (i.e wants instant gratification without proving 	



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				<p>worth of the function)</p> <ul style="list-style-type: none"> • Work schedule 	
	HR Assistants / Timekeepers	S, L	L	<ul style="list-style-type: none"> • Limited or No qualified applicant (Good ones are 	<ul style="list-style-type: none"> • Put emphasis on values education and formation when training people.



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action	
	Accounting Staff	L	L	<ul style="list-style-type: none"> • employed overseas) • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) 	<ul style="list-style-type: none"> • Too much importance is given to technical skills, thus overlooking the important values aspect of an employee. 	
	Human Resource Staff	L	L	<ul style="list-style-type: none"> • Employee's lack of values (i.e wants instant gratification without proving worth of the function) • Work schedule • Volume of Work 		
	Admin Assistant	S, L	L			
	Materials Testing Technician	S, L	L			



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Community Relations Officer	L			
	General Foremen	S, L	L	<ul style="list-style-type: none"> ● Scarcity of applicant due to other competition ● Limited or No qualified applicant (Good ones are employed overseas) ● Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) ● Employee's lack of values (i.e wants instant gratification without 	<ul style="list-style-type: none"> ● Strengthen sourcing strategies ● Put emphasis on values education and formation when training people. ● Too much importance is given to technical skills, thus overlooking the important values aspect of an employee.
	Foreman	S, L	L		
	Leadmen	S, L	L		
	Finishing Carpenters	S, L	L/H		
	Rough Carpenters	S, L	L/H		
	Unskilled Workers (Laborers / Helpers)	S, L	L/H		
	Tinsmiths	S, L	L/H		
	Pipefitters	S	L/H		
	Crane Operators (Mobile)	S, L	L/H		
	Crane Operators (Tower Cranes)	S, L	L/H		
	Dump Truck Drivers	S, L	L/H		
	Equipment Technicians	S, L	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Service Vehicle Drivers		L	proving worth of the function)	
	Spotters	S	M		
	Tower Light Tenders	L	M		
	Grader Operators	L	M		
	Transit Mixer Truck Drivers	L	L/M		
	Riggers	S, L	L	Qualified applicant may lack certification and experience	Strengthen sourcing strategies



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Heavy Equipment Mechanic (Advance)	L	L	<ul style="list-style-type: none"> • Qualified applicant may lack certification and experience • Limited or No qualified applicant (Good ones are employed overseas) • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) • Employee's lack of values (i.e wants instant gratification without proving 	<ul style="list-style-type: none"> • Strengthen sourcing strategies • Put emphasis on values education and formation when training people. • Too much importance is given to technical skills, thus overlooking the important values aspect of an employee.



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
				worth of the function)	
Industrial Construction	Project Supervisors	S	L	No qualified applicant	Strengthen sourcing strategies
	Field Engineers	S	L	Some qualified applicants have no License	
	Quantity Surveyors	L	L		
	Environment, Safety & Health Engineers/ Officers	S	L	<ul style="list-style-type: none"> • No qualified applicant • Lack certifications 	



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Project Manager	S, L	L	<ul style="list-style-type: none"> No qualified applicant Some demand higher pay 	
	Construction Manager	S	L		
	Finishing Carpenters	S	L	Scarcity of applicant due to other competition	
	Rough Carpenters	S	L		
	Finishing Masons	S	L		
	General Foremen	L	L		
	Foreman	L	L		
	Leadmen	L	L		
	Welders	L	L		
	Unskilled Workers (Laborers / Helpers)	L	L		
	Backhoe Operators	S	L		
	Crane Operators (Mobile)	S	L		
	Crane Operators (Tower Cranes)	L	L		
	Dump Truck Drivers	S	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Transit Mixer Truck Drivers	S	L		
	Service Vehicle Drivers	S	L		
	Riggers	S	L	Qualified applicant may lack certification and experience	
	Heavy Equipment Mechanic (Advance)	L	L		
Residential Construction	Project Manager	S, L	L	<ul style="list-style-type: none"> Limited or No qualified applicant (Good ones are employed overseas) Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) Employee's lack of values (i.e 	Strengthen sourcing strategies
	Construction Manager	S, L	L		
	Cost Engineers	S	L		
	HR Assistants / Timekeepers	S	L		
	Materials Engineer	S	L		
	Quality Control Supervisors/Engineers	S	L		
	Document Controller	S	L		
	Safety Assistants		L		
	Contract & Commercial Management Specialists	S	L		
	Procurement & Materials Management Officer	S	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Material Inventory Assistants / Warehouse	S	L	<p>wants instant gratification without proving worth of the function)</p> <ul style="list-style-type: none"> Some demand or seek higher pay 	
	Toolkeepers	S	L		
	Site HR Officers		L		
	Site Accounting Assistant	S	L		
	Pipefitters	S	L		
	Plumbers	S	L		
	Painters	S	L		
	Electricians	S	L		
	Tile Setters	S	L		
	Semi Skilled Workers	S	L		
	Scaffolders	S	L		
	Tinsmiths	S	L		
	Master Electrician	S	L		
	Millwright	S	L		
	Tig/SMAW/ GTAW Welder	S	L		
	Certified Scaffolders	S	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Erection Crew/Erectors	S	L		
	Pre Cast Masons/Skilled	S	L		
	Sandblasting Crew	S	L		
	Formworks Crew	S	L		
	Procurement Staff	L	L		
	Cost Planning & Control	L	L		
	Tender Planning & Estimating Staff	L	L		
	Logistics & Support Staff	L	L		
	Liaison Staff	L	L/M		
	Project Supervisors	S, L	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Cost Engineers	S	L	<p>not fully competent or well rounded to undertake responsibilities they apply for)</p> <ul style="list-style-type: none"> • Employee's lack of values (i.e wants instant gratification without proving worth of the function) • Some demand or seek higher pay • Work schedule 	<ul style="list-style-type: none"> • Training and development seminars • Too much importance is given to technical skills, thus overlooking the important values aspect of an employee.
	Compactors	S	L		
	Alimak Operators	S	L		
	Gondola Tenders	S	L		
	Generator Set Tenders	S	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Tower Light Tenders	S	L		
	Grader Operators	S	L		
	Skid Loader Operators	S	L		
	Stamping Machine Operators	S	L		
	Boom Truck Drivers	S	L		
	Equipment Maintenance Supervisors	S	L		
	Equipment Tool Keepers	S	L		
	Spotters	S	L		
	Field Engineers	S, L	L	<ul style="list-style-type: none"> • Some qualified applicants have no License • Limited or No qualified applicant (Good ones are 	<ul style="list-style-type: none"> • Strengthen sourcing strategies Put emphasis on values education and formation when training people. • Training and development seminars



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Environment, Safety & Health Engineers/Officers	S, L	L	<p>employed overseas)</p> <ul style="list-style-type: none"> • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) • Employee's lack of values (i.e wants instant gratification without proving worth of the function) • Seek higher pay • Work schedule 	<ul style="list-style-type: none"> • Too much importance is given to technical skills, thus overlooking the important values aspect of an employee.



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Quantity Surveyors	S, L	L/M	<ul style="list-style-type: none"> • Lack certifications • Limited or No qualified applicant (Good ones are employed overseas) • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) • Employee's lack of values (i.e wants instant gratification without proving worth of the function) 	
	Equipment Supervisors (Project Management)	S, L	L		
	Maintenance Technician	S, L	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	HR Assistants / Timekeepers	S	L	<ul style="list-style-type: none"> • Limited or No qualified applicant (Good ones are employed overseas) • Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) • Employee's lack of values (i.e wants instant gratification without proving worth of the function) • Work schedule • Volume of work 	<ul style="list-style-type: none"> • Put emphasis on values education and formation when training people. • Too much importance is given to technical skills, thus overlooking the important values aspect of an employee
	Human Resource Staff	L	L/M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Admin Assistant	S, L	L	<ul style="list-style-type: none"> Work schedule Volume of work 	
	Equipment Dispatchers	S, L	L		
	General Foremen	S, L	L	<ul style="list-style-type: none"> Scarcity of applicant due to other competition 	<ul style="list-style-type: none"> Strengthen sourcing strategies Put emphasis on values education and formation when training people.
	Foreman	S, L	L	<ul style="list-style-type: none"> Limited or No qualified applicant (Good ones are employed overseas) 	<ul style="list-style-type: none"> Too much importance is given to technical skills, thus overlooking the important values aspect of an employee
	Leadmen	S, L	L	<ul style="list-style-type: none"> Skills mismatch (Personnel not fully competent or well rounded to undertake responsibilities they apply for) 	
	Finishing Carpenters	S, L	L	<ul style="list-style-type: none"> Employee's lack of values (i.e 	
	Rough Carpenters	S, L	L		
	Welders	S, L	L		
	Finishing Masons	S, L	L		
	Unskilled Workers (Laborers / Helpers)	S, L	L		
	Backhoe Operators	S, L	L		
	Crane Operators (Mobile)	S, L	L		
	Crane Operators (Tower Cranes)	S, L	L		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Dump Truck Drivers	S, L	L	wants instant gratification without proving worth of the function)	
	Transit Mixer Truck Drivers	S, L	L		
	Service Vehicle Drivers	S, L	L		
	Riggers	S, L	L	<ul style="list-style-type: none"> • Qualified applicant may lack certification and experience • Scarcity of applicant due to other competition • Limited or No qualified applicant (Good ones are employed overseas) • Skills mismatch (Personnel not fully competent or well rounded to undertake 	
	Equipment Technicians	S	L		
	Heavy Equipment Mechanic (Advance)	L	L		
	Drilling Rig Operators	L	L		
	Accounting Staff	L	L/M		
	Treasury Staff	L	L/M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Billing & Collection Staff	L	L/M	responsibilities they apply for) <ul style="list-style-type: none"> Employee's lack of values (i.e. wants instant gratification without proving worth of the function) 	
Others (Construction Consultancy/ Training Provider)	Accounting Staff	S	M		
	Admin Assistant	S	M		
	Alimak Operators	S	H		
	Backhoe Operators	S	H		
	Billing & Collection Staff	S	M		
	Boom Truck Drivers	S	H		
	Certified Scaffolders	S	H		
	Community Relations Officer	S	M		
	Compactors	S	H		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Construction Manager	S	M		
	Contract & Commercial Management Specialists	S	M		
	Cost Engineers	S	M		
	Cost Planning & Control	S	M		
	Crane Operators (Mobile)	S	H		
	Crane Operators (Tower Cranes)	S	H		
	Document Controller	S	M		
	Dump Truck Drivers	S	H		
	Electricians	S	H		
	Environment, Safety & Health Engineers/Officers	S	M		
	Equipment Dispatchers	S	M/H		
	Equipment Maintenance Supervisors	S	H		
	Maintenance Technician	S	M		
	Equipment Supervisors (Project Management)	S	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Equipment Technicians	S	H		
	Equipment Tool Keepers	S	H		
	Erection Crew/Erectors	S	H		
	Field Engineers	S	M		
	Finishing Carpenters	S	H		
	Finishing Masons	S	H		
	Foreman	S	H		
	Formworks Crew	S	H		
	General Foremen	S	H		
	Generator Set Tenders	S	H		
	Gondola Tenders	S	H		
	Grader Operators	S	H		
	HR Assistants / Timekeepers	S	M		
	Human Resource Staff	S	M		
	Leadmen	S	H		
	Liaison Staff	S	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Logistics & Support Staff	S	M		
	Master Electrician	S	H		
	Material Inventory Assistants / Warehouse	S	M		
	Materials Engineer	S	M		
	Materials Testing Technician	S	M		
	Millwright	S	H		
	Painters	S	H		
	Pipefitters	S	H		
	Plumbers	S	H		
	PreCast Masons/Skilled	S	H		
	Procurement & Materials Management Officer	S	M		
	Procurement Staff	S	M		
	Project Manager	S	M		
	Project Supervisors	S	M		
	Quality Control Supervisors/Engineers	S	M		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Quantity Surveyors	S	M		
	Riggers	S	H		
	Rough Carpenters	S	H		
	Safety Assistants	S	M		
	Sandblasting Crew	S	H		
	Semi Skilled Workers	S	H		
	Service Vehicle Drivers	S	H		
	Site Accounting Assistant	S	M		
	Site HR Officers	S	M		
	Skid Loader Operators	S	H		
	Spotters	S	H		
	Stamping Machine Operators	S	H		
	Tender Planning & Estimating Staff	S	M		
	Tig/SMAW/ GTAW Welder	S	H		
	Tile Setters	S	H		



Subsector	Technical Jobs/Skills/ Qualifications	Jobs/Skills Immediately Needed (S: In the next 1-3 years; L: In the next 3-5 years)	Assess the Shortage of Workers in Filling-up the Skills Requirements (Low, L: <100; Medium, M: 100-500; High, H: >500)	Reasons/ Constraints in Filling-up the Skills Requirements	Recommended Action
	Tinsmiths	S	H		
	Toolkeepers	S	M		
	Tower Light Tenders	S	H		
	Transit Mixer Truck Drivers	S	H		
	Treasury Staff	S	M		
	Unskilled Workers (Laborers / Helpers)	S	H		
	Welders	S	H		

As PCA shared, most people perceive 3Ds in Construction that serve as the main reasons for leaving the industry: Dangerous, Dirty, and Difficult. This, then, results in a labor shortage. Another common problem is the low salary coupled with high cost of living.

Since discussions on salary may not be addressed by education and training programs, the other perceptions on construction may be changed through investments and technology.

For instance, PCA recognizes that the use of technology can help encourage new entrants and entice former workers to go back to construction, especially the younger ones. Other countries like Israel integrate robotics systems to masonry and painting. The sector is integrating modern technologies in its processes and operations that is expected to result in increased accuracy, efficiency, and productivity. Even in the experiences of the elevation installation sector, the future is in robot-operated drilling of rigs and brackets. Robotic installation is recommended to be included in the programs.



However, preparatory plans will be needed to invest in these technologies because this is the direction being taken in Industry 4.0. The industry would need a lot of investment for power tools. Additionally, this environment requires various competencies and digital literacy. The application of modern and emerging technologies is very fast that the industry and training institutions should be able to adapt. Still, workers won't be upgrading their skills without the proper type of training and as DPWH noted, the industry needs workers that are trained and qualified for safe and economical construction work, especially relative to the Build, Build, Build program.

Three jobs/skills were also highlighted in the skills map validation which includes Heavy Equipment Operator, Heavy Equipment Mechanic (Advance), and Elevator Installation.

For Heavy Equipment Operation (HEO) and Heavy Equipment (HE) Maintenance, Monark, ACEL, and DPWH validated that the requirements and demand for HEO and HE mechanic/technician (advance) is actually high in contrast to the numbers reflected on the presented results of the questionnaire.

Additionally, one of the mentioned plans in the future plan framework for the construction is the Design for Manufacturing and Assembly (DfMA) where Crane Operators specifically have a huge role to play. DfMA happens now in bits and pieces but once entirely implemented in the industry, that's where the need for specialized crane operators will enter. Specifically, the expected demand/need for this is projected to be seen/felt by 2023.

In terms of Elevator Installation, developing a program for after sales will also be needed which shall require service mechanics, callback mechanics, and repair mechanics. The representative of Concepcion Otis Philippines mentioned that after sales may cover basic preventive maintenance standards, basic troubleshooting of elevators, safety gears, and safety equipment repair (basic standards). These are basic standard training that the workers would need while the more specialized skills could be company specific, acquired through company training.

The representative from Lift Asia also added that the vertical transportation sector is one of the backbones of the construction industry. In the presented skills map, it appears that there is no specified requirement for additional manpower because most of the major elevator companies, according to the Lift Asia representative, are also the one who provides the training and the manpower for the construction industry. But in the representative's experience, there is a big demand for elevator installers in the Philippines and abroad.

However, many of the workers are not given good incentives or salary because they cannot present any training certification (e.g. from government agencies). Thus, the pay



grade of overseas Filipinos compared to other nationalities are at a disadvantage. Elevator installation is also needed in horizontal and vertical constructions.

With all things being said, PCA also highlighted the need of not just promoting manpower but also construction companies. For instance, more than developing workers, companies may be trained to go overseas and compete globally through joint venture partnerships. Instead of just the manpower going abroad in countries with lack of construction laborers, companies in the Philippines may enter into an agreement/partnership abroad. Companies will then supply the needed labor and go back to the Philippines after.

Thus, the Philippines will not always run the risk of losing the needed supply of equipped and competent manpower. This was also seconded and validated by one of the industry representatives who also had firsthand experience regarding losing manpower over global competitors.

Soft and Emerging Skills

In addition to technical skills, PCA and the industry noted that there is a need to strengthen and inculcate values formation in the existing workforce (i.e. soft skills, values). Based on the discussion, the industry is observing that the soft skills seem to be lacking and that there is a need to advance integrity and ethics development on top of equipping workers with technical skills.

As such, the following are the soft and emerging skills seen as critical to the Construction personnel:

Table 3. List of soft/essential skills and emerging skills associated with 4IR relevant to the Construction Sector

Soft Skills/Essential Requirements	Emerging Skills Associated with 4IR
<ul style="list-style-type: none"> ● Communication Skills ● Teamwork ● Adaptability and Flexibility ● Quality of Work ● Leadership Skills ● Commitment ● Integrity ● Accountability ● Stress Management ● People Handling/Management Skills ● Work Methods and Work Ethics 	<ul style="list-style-type: none"> ● Virtual Reality ● Resilience ● Stress tolerance ● Flexibility ● Creative Critical Thinking ● Working Remotely ● Big Data Analytics ● Machine Learning ● People Management ● Quality Control ● Focus Pro-active Safety ● Mobile for Real Time Communication



Soft Skills/Essential Requirements	Emerging Skills Associated with 4IR
<ul style="list-style-type: none"> ● Critical/Creative Thinking and Problem Solving ● Decision Making Skills ● Occupational Safety and Health ● Planning & Organizing ● Work Quality ● Reading and Comprehension 	<ul style="list-style-type: none"> ● Digital Cost Management (5D BIM) ● BIM Measurement ● Cost Estimating, Budgeting & Control Management ● Digital skills

4.4. Possible Providers of the Program

The following are said to be the possible providers/partners of the Construction Program:

- Concepcion Otis Philippines, Inc.
- Philippine Constructors Association, Inc. (PCA)
- Philippine Institute of Certified Quantity Surveyors, Inc. (PICQS) Academy
- Monark Foundation, Inc.
- Don Bosco Balamban Technological Center, Inc.
- Occupational safety and health center
- Human resource group
- Construction Manpower Development Foundation (CMDF)
- Concepcion Otis Philippines
- Association of Carriers and Equipment Lessors, Inc. *(also has training for Heavy Equipment operator)*

4.5. Other Affected Sector/Sub-Industries

The following are said to be sub-industry employment of the Construction sector:

Table 4. Sub-industry employment per Construction

Subsector	Sub-Industry Employment
Industry/Industrial Construction	Logistics and Warehousing
	Metals and Engineering



Subsector	Sub-Industry Employment
Residential Construction	Logistics and Warehousing
	Metals and Engineering
Vertical Construction	Electrical and Electronics
	Furniture and Fixtures
	Human Health / Health Care
	Logistics and Warehousing
	Metals and Engineering
	Tourism (Hotel and Restaurant)
	Wholesale and Retail Trading
Horizontal Construction	Automotive and Land Transportation
	Electrical and Electronics
	Furniture and Fixtures
	Human Health / Health Care
	Logistics and Warehousing
	Metals and Engineering
	Tourism (Hotel and Restaurant)
	Wholesale and Retail Trading



Subsector	Sub-Industry Employment
Others (Construction Consultancy/Training Provider)	Education: QS firms, Cost Consulting Firms
	Logistics and Warehousing

In summary, most can be employed in eight industries such as Electrical and Electronics, Human Health/Health Care, Automotive and Land Transportation, Furniture and Fixtures, Logistics and Warehousing, Metals and Engineering, Tourism, and Wholesale and Retail Trading.

V. Mapping of Skills Requirements vis-à-vis Existing TR

To determine if the supply (i.e. TVET capacity and TVET infrastructure) meet the demands of the industry, listed below is the summary of the identified priority technical jobs/skills/qualifications across all the subsectors, with their equivalent qualification (WTR).

Table 5. Equivalent Qualifications for the Priority Jobs/Skills in the Construction Industry, by Value Chain.

Value Chain	Technical Jobs/Skills/Qualifications	Equivalent Qualification (WTR)	Remarks
Project Management	Maintenance Technician	Heavy Equipment Servicing (Mechanical) NC II	
	Project Manager	- No Available TR -	<ul style="list-style-type: none"> According to PCA, may require the following degree depending on the project: (CE/EE/ME/Architect)
	Construction Manager	- No Available TR -	<ul style="list-style-type: none"> According to PCA, may require the following degree depending on the project: (CE/EE/ME/Architect)
	Project Supervisors	- No Available TR -	<ul style="list-style-type: none"> According to PCA, may require the following degree depending on the project: (CE/EE/ME/Architect) Competency Standards already developed: <ol style="list-style-type: none"> Construction Trade Supervision Level IV



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
			2. Construction Site Supervision Level IV
	Field Engineers	- No Available TR -	According to PCA, may require the following degree depending on the project: (CE/EE/ME/Architect)
	Materials Engineer	- No Available TR -	
	Materials Testing Technician	- No Available TR -	
	Quality Control Supervisors/Engineers	- No Available TR -	
	Document Controller	- No Available TR -	
	Environment, Safety & Health Engineers/Officers	- No Available TR -	
	Safety Assistants	- No Available TR -	
	Community Relations Officer	- No Available TR -	
	Quantity Surveyors	- No Available TR -	
	Contract & Commercial Management Specialists	- No Available TR -	
	Cost Engineers	- No Available TR -	According to PCA, may require the following degree depending on the project: (CE/EE/ME/Architect)
	Procurement & Materials Management Officer	- No Available TR -	
	Material Inventory Assistants / Warehouse	- No Available TR -	
	Toolkeepers	- No Available TR -	
	Site HR Officers	- No Available TR -	
	HR Assistants / Timekeepers	- No Available TR -	
	Site Accounting Assistant	- No Available TR -	Bookkeeping NC III includes accounting clerks in the list of jobs. However, accounting assistants may have job differences with accounting clerks.
	Admin Assistant	- No Available TR -	According to PCA, this qualification may be needed for large projects



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
	Equipment Dispatchers	- No Available TR -	Warehousing Services TRs includes Dispatchers/Dispatchers Officers. However, it may not cover the identified jobs/skills.
Direct Workers	Rough Carpenters	Carpentry NC II	According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Welders	Gas Metal Arc Welding (GMAW) NC I	
		Gas Metal Arc Welding (GMAW) NC II	
		Gas Metal Arc Welding (GMAW) NC III	
		Flux Cored Arc Welding (FCAW) NC I	
		Flux Cored Arc Welding (FCAW) NC II	
		Flux Cored Arc Welding (FCAW) NC III	
		Submerged Arc Welding (SAW) NC I	
		Submerged Arc Welding (SAW) NC II	
		Gas Welding NC I	
		Gas Welding NC II	
	Pipefitters	Pipefitting (Metallic) NC II	According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Plumbers	Plumbing I	According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
		Plumbing II	



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
		Plumbing III	
	Painters	Construction Painting NC II	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
		Construction Painting NC III	
	Electricians	Electrical Installation and Maintenance NC II	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Tile Setters	Tile Setting NC II	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Tig/SMAW/ GTAW Welder	Manual Metal Arc Welding (MMAW) NC I	- Formerly titled as Shielded Metal Arc Welding (SMAW) but renamed through the TESDA Circular No. 100, s. 2021 - According to PCA, this job/skill is needed in general construction (civil works, buildings)
		Manual Metal Arc Welding (MMAW) NC II	
		Manual Metal Arc Welding (MMAW) NC III	
		Manual Metal Arc Welding (MMAW) NC IV	
		Gas Tungsten Arc Welding (GTAW) NC II	
		Gas Tungsten Arc Welding (GTAW) NC IV	
	Scaffolders	Scaffolding Works NC II (Supported Type Scaffold)	
	Certified Scaffolders	Scaffolding Works NC II (Supported Type Scaffold)	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Erection Crew/Erectors	Structural Erection NC II	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Formworks Crew	System Formworks Installation NC II	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
	Tinsmiths	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Foreman	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Leadmen	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Finishing Carpenters	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	General Foremen	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Master Electrician	- No Available TR -	- According to PCA, this jobs/skill is needed in general construction (civil works, buildings)
	Semi Skilled Workers	- No Available TR -	
	Unskilled Workers (Laborers / Helpers)	- No Available TR -	
	Millwright	- No Available TR -	
	Pre Cast Masons/Skilled	- No Available TR -	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Finishing Masons	- No Available TR -	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Sandblasting Crew	- No Available TR -	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Water well drilling	- No Available TR -	- There is currently a CS titled Water Well Drilling Level II
	Elevator Installation Technician	- No Available TR -	- There is currently a CS titled Elevator Installation Level II
	Backhoe Operators	HEO (Hydraulic Excavator) NC II	



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
Equipment (Operators and Maintenance)	Crane Operators (Tower Cranes)	HEO (Tower Crane) NC III	
	Compactors	HEO (Road Roller) NC II	
	Grader Operators	HEO (Motor Grader) NC II	
	Dump Truck Drivers	HEO (Articulated Off-Highway Dump Truck) NC II	
		HEO (Rigid Off-Highway Dump Truck) NC II	
		HEO (Rigid On-Highway Dump Truck) NC II	
	Transit Mixer Truck Drivers	HEO (Transit Mixer) NC II	
	Service Vehicle Drivers	Driving NC II	
		Driving (Passenger Bus/Straight Truck) NC III	
	Equipment Technicians	Heavy Equipment Servicing (Mechanical) NC II	
	Riggers	Rigging NC I	- According to PCA, this job/skill is needed in the Oil & Gas, Power & Energy, and Industrial Projects
	Crane Operators (Mobile)	HEO (Crawler Crane) NC III	
		HEO (Rough Terrain Crane) NC III	
		HEO (Truck Mounted Crane) NC III	
	Alimak Operators	Construction Lift Passenger/ Material Elevator Operation NC II	
	Gondola Tenders	- No Available TR -	
	Generator Set Tenders	- No Available TR -	
	Tower Light Tenders	- No Available TR -	
	Skid Loader Operators	- No Available TR -	
	Stamping Machine Operators	- No Available TR -	
Drilling Rig Operators	- No Available TR -		
Boom Truck Drivers	- No Available TR -		
Heavy Equipment Mechanic (Advance)	- No Available TR -		



Value Chain	Technical Jobs/Skills/ Qualifications	Equivalent Qualification (WTR)	Remarks
	Equipment Maintenance Supervisors	- No Available TR -	
	Equipment Tool Keepers	- No Available TR -	
	Spotters	- No Available TR -	
Corporate / Head Office Support	Procurement Staff	- No Available TR -	
	Accounting Staff	- No Available TR -	- Bookkeeping NC III includes accounting clerks in the list of jobs. However, accounting assistants may have job differences with accounting clerks.
	Cost Planning & Control	- No Available TR -	
	Tender Planning & Estimating Staff	- No Available TR -	
	Treasury Staff	- No Available TR -	
	Billing & Collection Staff	- No Available TR -	
	Human Resource Staff	- No Available TR -	
	Logistics & Support Staff	- No Available TR -	
	Liaison Staff	- No Available TR -	- Multimodal Transport Operation and Logistics (Seafreight Import) Services NC II includes liaison personnel in the list of jobs. However, it may not cover the identified jobs/skills.

According to PCA, jobs/skills such as Engineering does not always require a higher/bachelor's degree in construction and thus, may still be covered in TVET programs. Educational background depends on the type of projects as the organization noted. Thus, those jobs/skills listed in Table 5 and with remarks of CE/EE/ME/Architect may still be considered in the development of programs.

Moreover, as reflected in the table, jobs/skills listed under the Equipment Operators and Maintenance category are considered as jobs/skills/competencies common for most construction projects.

Meanwhile, most of the jobs/skills listed under the Direct Workers category are considered as jobs/skills/competencies needed in general construction (i.e civil works,



buildings). Some are demanded as well in the related fields of Oil & Gas, Power & Energy, and Industrial Projects.

VI. TVET Capacity

• Enrolled

Presented below are the tables reflecting the summary of the existing Training Regulations corresponding to the identified priority jobs and skills in the construction industry during the sectoral consultation.

Table 6. Total Number of Enrolled in the Construction-related Training Regulations, by Qualifications (WTR) by Sex, 2021.

Qualifications (WTR)	Enrolled		
	Male	Female	Total
Carpentry NC II	242	33	275
Construction Lift Passenger/ Material Elevator Operation NC II			
Construction Painting NC II			
Construction Painting NC III			
Driving NC II	706	321	1,027
Driving (Passenger Bus/Straight Truck) NC III			
Electrical Installation and Maintenance NC II	1,173	107	1,280
Flux Cored Arc Welding (FCAW) NC I			
Flux Cored Arc Welding (FCAW) NC II			
Flux Cored Arc Welding (FCAW) NC III			
Gas Metal Arc Welding (GMAW) NC I			
Gas Metal Arc Welding (GMAW) NC II	27	0	27
Gas Metal Arc Welding (GMAW) NC III			
Gas Tungsten Arc Welding (GTAW) NC II			
Gas Tungsten Arc Welding (GTAW) NC IV			
Gas Welding NC I			
Gas Welding NC II			
HEO (Articulated Off-Highway Dump Truck) NC II	7	0	7
HEO (Crawler Crane) NC III			
HEO (Hydraulic Excavator) NC II	3	0	3
HEO (Motor Grader) NC II			
HEO (Rigid Off-Highway Dump Truck) NC II			



Qualifications (WTR)	Enrolled		
	Male	Female	Total
HEO (Rigid On-Highway Dump Truck) NC II			
HEO (Road Roller) NC II			
HEO (Rough Terrain Crane) NC III			
HEO (Tower Crane) NC III			
HEO (Transit Mixer) NC II	3	0	3
HEO (Truck Mounted Crane) NC III			
Heavy Equipment Servicing (Mechanical) NC II			
Shielded Metal Arc Welding (MMAW) NC I*	329	60	389
Shielded Metal Arc Welding (MMAW) NC II*	593	79	672
Shielded Metal Arc Welding (MMAW) NC III*	1	0	1
Shielded Metal Arc Welding (MMAW) NC IV*			
Pipefitting (Metallic) NC II	11	4	15
Plumbing NC I	16	4	20
Plumbing NC II	39	11	50
Plumbing NC III			
Rigging NC I			
Scaffolding Works (Supported Type Scaffold) NC II	19	0	19
Structural Erection NC II			
Submerged Arc Welding (SAW) NC I			
Submerged Arc Welding (SAW) NC II			
System Formworks Installation NC II			
Tile Setting NC II	32	3	35

Legend: Gray filled rows are those without available data

Note: * Shielded Metal Arc Welding (SMAW) TRs are now amended as Manual Metal Arc Welding (MMAW) although still no data for MMAW as these are newly promulgated.

Source: TESDA ICTO

In terms of the Total Number of Enrolled by Qualifications (WTR) by Sex (2021), Electrical Installation and Maintenance NC II recorded the highest number of enrollees, with a total of 1,280 enrollee, followed by Driving NC II with 1,027, and Shielded Metal Arc Welding (SMAW) NC II with 672. Among the qualifications listed, Shielded Metal Arc Welding (SMAW) NC III, with only one enrollee (no female enrollee).

Meanwhile, 29 of the 44 TRs (66%) do not have any enrollees in 2021. From this list, HEO (Tower Crane) NC III, HEO (Crawler Crane) NC III, HEO (Rough Terrain Crane) NC III, and HEO (Truck Mounted Crane) NC III were amended in 2019; while Shielded Metal Arc Welding (SMAW) TRs were superseded in 2021.



- **Graduated**

Table 7. Total Number of Graduates in the Construction-related Training Regulations, by Qualifications (WTR) by Sex, 2021.

Qualifications (WTR)	Graduated		
	Male	Female	Total
Carpentry NC II	242	32	274
Construction Lift Passenger/ Material Elevator Operation NC II			
Construction Painting NC II			
Construction Painting NC III			
Driving NC II	630	273	903
Driving (Passenger Bus/Straight Truck) NC III			
Electrical Installation and Maintenance NC II	1,046	106	1,152
Flux Cored Arc Welding (FCAW) NC I			
Flux Cored Arc Welding (FCAW) NC II			
Flux Cored Arc Welding (FCAW) NC III			
Gas Metal Arc Welding (GMAW) NC I			
Gas Metal Arc Welding (GMAW) NC II	27	0	27
Gas Metal Arc Welding (GMAW) NC III			
Gas Tungsten Arc Welding (GTAW) NC II			
Gas Tungsten Arc Welding (GTAW) NC IV			
Gas Welding NC I			
Gas Welding NC II			
HEO (Articulated Off-Highway Dump Truck) NC II	7	0	7
HEO (Crawler Crane) NC III			
HEO (Hydraulic Excavator) NC II	3	0	3
HEO (Motor Grader) NC II			
HEO (Rigid Off-Highway Dump Truck) II			
HEO (Rigid On-Highway Dump Truck) NC II			
HEO (Road Roller) NC II			
HEO (Rough Terrain Crane) NC III			
HEO (Tower Crane) NC III			
HEO (Transit Mixer) NC II	3	0	3
HEO (Truck Mounted Crane) NC III			
Heavy Equipment Servicing (Mechanical) NC II			



Qualifications (WTR)	Graduated		
	Male	Female	Total
Shielded Metal Arc Welding (MMAW) NC I*	366	56	422
Shielded Metal Arc Welding (MMAW) NC II*	528	76	604
Shielded Metal Arc Welding (MMAW) NC III*			
Shielded Metal Arc Welding (MMAW) NC IV*			
Pipefitting (Metallic) NC II	11	4	15
Plumbing NC I	16	4	20
Plumbing NC II			
Plumbing NC III			
Rigging NC I			
Scaffolding Works (Supported Type Scaffold) NC II	19	0	19
Structural Erection NC II			
Submerged Arc Welding (SAW) NC I			
Submerged Arc Welding (SAW) NC II			
System Formworks Installation NC II			
Tile Setting NC II	32	3	35

Legend: Gray filled rows are those without available data

*Note: * Shielded Metal Arc Welding (SMAW) TRs are now amended as Manual Metal Arc Welding (MMAW) although still no data for MMAW as these are newly promulgated.*

Data may also include overspill.

Source: TESDA ICTO

In terms of graduates, Electrical Installation and Maintenance NC II ranks first with a total of 1,152 graduates, followed by Driving NC II with 903 graduates, and Shield Metal Arc Welding (SMAW) NC II with 604 graduates. Among the qualifications listed, HEO (Hydraulic Excavator) NC II HEO (Transit Mixer) NC II and constitute the least summation, with only three graduates.

The TRs with no available data for graduates are the same with those found in Table 7 with Manual Metal Arc Welding (MMAW) NC III and Plumbing NC II being added in the list for the graduates, which makes 31 out of 44 TRs (70%) having no graduates for 2021.

- **Assessed and Certified**

Table 8. Total Number of Assessed and Certified in the Construction-related Training Regulations, by Qualifications (WTR) by Sex, 2021.



Qualifications (WTR)	Assessed			Certified		
	Male	Female	Total	Male	Female	Total
Carpentry NC II	6,919	893	7,812	6,675	845	7,520
Construction Lift Passenger/ Material Elevator Operation NC II						
Construction Painting NC II	1,073	438	1,511	1,050	430	1,480
Construction Painting NC III						
Driving NC II	42,290	12,124	54,414	39,515	11,192	50,707
Driving (Passenger Bus/Straight Truck) NC III	3,864	86	3,950	3,634	82	3,716
Electrical Installation and Maintenance NC II	28,048	2,694	30,742	25,617	2,422	28,039
Flux Cored Arc Welding (FCAW) NC I						
Flux Cored Arc Welding (FCAW) NC II	2	101	103	98	2	100
Flux Cored Arc Welding (FCAW) NC III						
Gas Metal Arc Welding (GMAW) NC I	21	9	30	21	9	30
Gas Metal Arc Welding (GMAW) NC II	1,019	103	1,122	1,012	102	1,114
Gas Metal Arc Welding (GMAW) NC III	22	1	23	22	1	23
Gas Tungsten Arc Welding (GTAW) NC II	1,607	130	1,737	1,589	128	1,717
Gas Tungsten Arc Welding (GTAW) NC IV						
Gas Welding NC I						
Gas Welding NC II						
HEO (Articulated Off-Highway Dump Truck) NC II						
HEO (Crawler Crane) NC III	14	0	14	9	0	9
HEO (Hydraulic Excavator) NC II	4,909	118	5,027	4,763	117	4,880
HEO (Motor Grader) NC II	519	8	527	501	8	509
HEO (Rigid Off-Highway Dump Truck) II	82	1	83	80	1	81
HEO (Rigid On-Highway Dump Truck) NC II	3,303	38	3,341	3,109	32	3,141
HEO (Road Roller) NC II	429	1	430	378	1	379
HEO (Rough Terrain Crane) NC III	39	1	40	20	0	20
HEO (Tower Crane) NC III	6	0	6	6	0	6
HEO (Transit Mixer) NC II	162	2	164	152	2	154
HEO (Truck Mounted Crane) NC III	24	0	24	5	0	5
Heavy Equipment Servicing (Mechanical) NC II	133	3	136	124	3	127
Shielded Metal Arc Welding (SMAW) NC I*	21,498	3,080	24,578	20,375	2,913	23,288
Shielded Metal Arc Welding (SMAW) NC II*	31,198	3,518	34,716	29,365	3,260	32,625
Shielded Metal Arc Welding (SMAW) NC III*	1,594	256	1,850	1,549	242	1,791
Shielded Metal Arc Welding (SMAW) NC IV*	139	33	172	137	32	169
Pipefitting (Metallic) NC II	726	68	794	721	68	789



Qualifications (WTR)	Assessed			Certified		
	Male	Female	Total	Male	Female	Total
Plumbing NC I	725	199	924	703	192	895
Plumbing NC II	1,862	295	2,157	1,674	259	1,933
Plumbing NC III	35	5	40	35	5	40
Rigging NC I	1,499	20	1,519	1,421	18	1,439
Scaffolding Works (Supported Type Scaffold) NC II	4,425	86	4,511	4,313	84	4,397
Structural Erection NC II						
Submerged Arc Welding (SAW) NC I						
Submerged Arc Welding (SAW) NC II						
System Formworks Installation NC II	19	1	20	19	1	20
Tile Setting NC II	3,321	935	4,256	3,171	898	4,069

Legend: Gray filled rows are those without available data

*Note: *Shielded Metal Arc Welding (SMAW) TRs are now amended as Manual Metal Arc Welding (MMAW) although still no data for MMAW as these are newly promulgated.*

Data may also include overspill.

Source: TESDA Certification Office

In terms of the Total Number of Assessed and Certified by Qualifications (WTR) by Sex (2021), Driving NC II has the highest total number for both assessed and certified, with a total of 54,414 and 50,707, respectively. This is followed by Shielded Metal Arc Welding NC II with a total number of 34,716 (Assessed) and 32,625 (Certified). Among the qualifications listed, HEO (Tower Crane) NC III constitutes for the least total number, with only 6 (assessed and certified).

Additionally, there are 11 out of 44 (25%) TRs with no data for assessed and certified are the following:

1. Construction Lift Passenger/ Material Elevator Operation NC II
2. Construction Painting NC III
3. Flux Cored Arc Welding (FCAW) NC I
4. Flux Cored Arc Welding (FCAW) NC III
5. Gas Tungsten Arc Welding (GTAW) NC IV
6. Gas Welding NC I
7. Gas Welding NC II
8. HEO (Articulated Off-Highway Dump Truck) NC II
9. Structural Erection NC II
10. Submerged Arc Welding (SAW) NC I
11. Submerged Arc Welding (SAW) NC II



VII. Way Forward

The following are the recommended action items to cope up with the demands of the Construction Industry.

- **Prioritization of Construction Industry Skills**

For the identified priority skills that do not have available TRs, there is an opportunity to formulate either a Full-blown Training Regulation or Competency Standards in order to remain relevant and competitive to the industry demands.

Relative to this, one of the challenges mentioned in the consultation is on making the TVET programs enticing especially to either encourage new entrants or encourage former construction laborers to go back to the industry. Thus, a critical consideration in the development of a CS or TR is also the adoption and integration of the use of modern tools and technology in construction in response to automation and modernization of the industry.

Development of a Full-Blown Training Regulation

Skills requirements identified as needed in the next 1-3 years and 3-5 years that are of high demand (above 500 workers) in the assessment of worker shortage are recommended for the development of a full-blown TR, named as follows:

- Finishing Carpenters
- Master Electrician
- Semi Skilled Workers
- Heavy Equipment Mechanic (Advance)
- Unskilled Workers (Laborers / Helpers)
- Millwright
- Finishing Masons
- Sandblasting Crew
- Tinsmithing

Although there is an existing TR for tinsmithing, the qualification title is more focused on automotive industry (i.e. Tinsmithing (Automotive Manufacturing) NC II). There might be specific/core qualifications for tinsmithing in the construction industry that is not covered in the promulgated TR.

For Heavy Equipment (HE) Mechanic (Advance), Monark, ACEL, and experts validated that the requirements and demand for the job is high in contrast to the numbers reflected on the presented results of the questionnaire. According to Monark, although not publicly offered, they initiated the curriculum development for NC Heavy Equipment Mechanic NC III and NC IV because their partner institutions are always looking for higher skills



qualification.

Development of a Competency Standard

Skills requirements identified as needed in the next 1-3 years and 3-5 years that are of low demand (below 100 workers) and of medium demand (100-500 workers) in the assessment of worker shortage are recommended for the development of a Competency Standard, named as follows:

- Project Manager
- Construction Manager
- Field Engineers
- Materials Engineer
- Materials Testing Technician
- Quality Control Supervisors/Engineers
- Document Controller
- Environment, Safety & Health Engineers/Officers
- Safety Assistants
- Community Relations Officer
- Quantity Surveyors
- Contract & Commercial Management Specialists
- Cost Engineers
- Procurement & Materials Management Officer
- Material Inventory Assistants / Warehouse
- Toolkeepers
- Site HR Officers
- HR Assistants / Timekeepers
- Site Accounting Assistant
- Admin Assistant
- Foreman
- Leadmen
- General Foremen
- Pre Cast Masons/Skilled
- Gondola Tenders
- Generator Set Tenders
- Tower Light Tenders
- Skid Loader Operators
- Stamping Machine Operators
- Drilling Rig Operators
- Boom Truck Drivers
- Equipment Maintenance Supervisors
- Equipment Tool Keepers
- Spotters
- Procurement Staff
- Accounting Staff
- Cost Planning & Control
- Tender Planning & Estimating Staff
- Treasury Staff
- Billing & Collection Staff
- Human Resource Staff
- Logistics & Support Staff
- Liaison Staff
- Equipment Dispatchers

As for the Elevator Installation Technician, there is a Competency Standard being offered for the said qualification. However, with the technological developments, the industry experts mentioned that there might be a need to develop a separate program. For instance, after sales is needed which shall require service mechanics, callback mechanics, and repair mechanics. After sales may cover basic preventive maintenance standards,



basic troubleshooting of elevators, safety gears, and safety equipment repair (basic standards). Additionally, robotic installation should also be part of the program.

Thus, the Qualifications and Standards Office is recommended to review the existing Competency Standards being offered for the qualification and evaluate if there is a need to enhance the existing CS or develop a separate program.

Further, some of the skills may also be combined under one qualification with different NC levels for upskilling. For instance, Quantity Surveying also encompasses Contract and Commercial, Cost Planning and Control, Cost Engineers, and Tender Planning and Estimation.

- **Consideration for the Scholarship Provision**

The identified skills requirements are recommended to be considered in the prioritization of the scholarship allocation.

Furthermore, it is also worth noting that among the scholarship programs, the Tulong Trabaho program seems to fit the requirement of the sector, considering that the Construction industry is moving towards a more modernized, automated, and technology-driven industry. With the emerging skills and the demands of the Build, Build, Build project, the identified skills shall then form part of the Selected Training Programs (STPs).

- **Review and Enhancement of Existing Training Regulations**

TESDA recognizes the importance of constant updating and upgrading of the Training Regulations (TR) alongside industry experts and practitioners. Ideally, TRs should be reviewed every 3-5 years or depending on the request of the industry.

According to PCA, even with the investments to modernize the construction industry (e.g., modern tools and equipment), without trained workers in the use of new technologies, resources will be unutilized. Further, due to the lack of trained workers, companies and organizations are sometimes hesitant to invest in new technologies.

Due to the continuous modernization of the Construction industry and the application of modern technology, some of the existing TRs may no longer be sufficient to address the needs/demands of the industry.

Thus, the Qualifications and Standards Office shall review and revisit the TRs from time to time with the introduction and inclusion of new technologies, specifically the TRs on



Heavy Equipment Operation. The future plans framework for the Construction Sector shall also serve as the basis of QSO in making the TVET programs 4IR ready (See Figure 2).

- **Strengthening the TVET Capacity of Existing Training Regulations**

TESDA must enhance the appropriate TVET Capacity of the relevant available Training Regulations, focusing on skills requirements identified as critical to the industry. For instance, the supply of graduates for welding and HEO courses needs to be strengthened especially as the number of enrolled and graduates are far lower than the expected demand and projected shortage of workers.

Moreover, TESDA may focus on improving the assessment centers, competency assessors, registered programs, and National TVET Trainer Certificate holders for the relevant TRs. Availability of training providers and assessors specially in the regions should be increased to adequately meet demand.

Based on Table 9, there are several construction related training regulations that need improvement in terms of the number of Assessment Centers (AC), Competency Assessors (CA), registered programs, and number of trainers.

Table 9. Summary of the Number of Assessment Centers, Competency Assessors, Registered Programs, and NTTC Holder per Qualification (WTR), F.Y. 2021.

Qualifications (WTR)	Number of Assessment Centers	Number of Competency Assessors	Number of Registered Programs	Number of NTTC Holder
Carpentry NC II	91	222	193	590
Construction Lift Passenger/ Material Elevator Operation NC II				
Construction Painting NC II	28	56	46	134
Construction Painting NC III				4
Driving NC II	309	641	624	1,752
Driving (Passenger Bus/Straight Truck) NC III	60	109	30	162
Electrical Installation and Maintenance NC II	212	597	433	1,490
Flux Cored Arc Welding (FCAW) NC I	1	1	6	
Flux Cored Arc Welding (FCAW) NC II	14	18	14	109
Flux Cored Arc Welding (FCAW) NC III	1			1
Gas Metal Arc Welding (GMAW) NC I	7	8	16	
Gas Metal Arc Welding (GMAW) NC II	36	80	58	335
Gas Metal Arc Welding (GMAW) NC III	2	3	3	15
Gas Tungsten Arc Welding (GTAW) NC II	43	76	72	323
Gas Tungsten Arc Welding (GTAW) NC IV		2		



Qualifications (WTR)	Number of Assessment Centers	Number of Competency Assessors	Number of Registered Programs	Number of NTTC Holder
Gas Welding NC I	1		1	
Gas Welding NC II	1	1	4	3
HEO (Articulated Off-Highway Dump Truck) NC II	1	1		1
HEO (Crawler Crane) NC III	2			
HEO (Hydraulic Excavator) NC II	72	100	77	196
HEO (Motor Grader) NC II	26	35	21	72
HEO (Rigid Off-Highway Dump Truck) II	4	7	2	15
HEO (Rigid On-Highway Dump Truck) NC II	50	70	39	126
HEO (Road Roller) NC II	27	20	12	34
HEO (Rough Terrain Crane) NC III	2			
HEO (Tower Crane) NC III	1			
HEO (Transit Mixer) NC II	10	5	1	9
HEO (Truck Mounted Crane) NC III	2			
Heavy Equipment Servicing (Mechanical) NC II	4	10	4	23
Manual Metal Arc Welding (MMAW) NC I*	267	449	529	
Manual Metal Arc Welding (MMAW) NC II*	328	696	764	2,216
Manual Metal Arc Welding (MMAW) NC III*	38	55	55	291
Manual Metal Arc Welding (MMAW) NC IV*	4	10	3	58
Pipefitting (Metallic) NC II	10	13	9	39
Plumbing NC I	23	22	36	
Plumbing NC II	48	75	87	216
Plumbing NC III	3	3	1	18
Rigging NC I	9	17	5	21
Scaffolding Works (Supported Type Scaffold) NC II	40	55	31	107
Structural Erection NC II				
Submerged Arc Welding (SAW) NC I		1		
Submerged Arc Welding (SAW) NC II				
System Formworks Installation NC II	1	5	1	3
Tile Setting NC II	61	106	99	315

Legend: Gray filled rows are those without available data

Note: *Data on MMAW is still based on Shielded Metal Arc Welding (SMAW) TRs.

Data may also include overspill.

Source: TESDA Certification Office



As reflected in Table 9, 12 out of 44 (27%) of the existing TRs related to the identified priority skills needs/requirements in the Construction sector are unutilized and currently do not have any registered programs. In addition, out of the 44 TRs six (6) do not have Assessment Centers, 10 do not have Competency Assessors, and 14 have no NTTC holder.

These data shall be used by the QSO in reviewing the TRs and identifying the reasons why the TVET programs are unutilized. The information shall serve as basis in determining the necessary action steps to be taken to ensure that the TRs are still relevant and responsive to the industry demands. Additionally, the results of the TR evaluation study of the Planning Office - Policy Research and Evaluation Division shall also serve as basis for determining the priority TRs to be subjected to review.

- **Strengthening and Enhancing the TVET Infrastructure vis-a-vis Technological Developments**

Efforts should be made to continuously strengthen and enhance the TVET infrastructures particularly regarding trainers and Technical Vocational Institutions (TVI) / learning institutions.

TVIs must be capacitated with the right technology tools and equipment that will allow them to offer the TVET programs to be enhanced or developed. Although for the most part PCA and the industry had been more reliant on enterprise-based training, the industry also acknowledges that they need to explore other delivery modes.

Monark Foundation Inc. provided the following recommendations: 1) private TVIs or companies may provide the training; and 2) TESDA can focus on providing and implementing the training programs that private TVIs and enterprise-based cannot provide, particularly on higher level skills. Additionally, Monark recommended categorizing the training providers based on their capacity to provide or offer programs (i.e. by NC level). In this regard, it is suggested that the Certification Office will consider the recommendations raised by Monark and PCA during the industry consultation.

Further, the Regional and Provincial Offices (ROPO) are recommended to evaluate the capacity of the TVIs to provide programs that will include new technology tools and equipment, and consequently assess the need to upgrade the training facilities. ROPOs should also spearhead the development of plans and strategies to ensure that appropriate actions will be taken in response to this. Additionally, the program implementation should be properly monitored and evaluated.

Moreover, upgrading the learning institutions should coincide with training the trainer's program to ensure that their knowledge, skills, and competencies are at par with the industry needs. Besides technical skills, trainers should also be equipped with soft skills. The National TVET Trainers Academy (NTTA) is recommended to take the lead in ensuring an effective and successful trainers' training to ensure that the implementation



of existing TRs match the needs of the industry. NTTA should also ensure that trainers are equipped with skills that will produce globally competitive workers in response to new technologies.

- **Incorporating Soft Skills and Emerging Skills in the Program**

During the industry consultation, most industry experts and practitioners agreed that the soft skills/attributes are critical to the Construction personnel, especially for encouraging employee retention and improving leadership. Accordingly, a lot of project managers still need training and they also lack soft skills such as presentation skills and writing.

The proportion of jobs in the future workplace will rely on soft/essential skills in light of automation and artificial intelligence. Provided that 21st century skills are already embedded in the existing TRs, ROPOs shall monitor the implementation of the programs. Existing gaps are recommended to be evaluated in response to the industry's feedback regarding the need to strengthen soft skills and values formation in their workforce.



VIII. References

Construction sector in the Philippines - statistics & facts. (2021). Retrieved from <https://www.statista.com/topics/6011/construction-sector-in-the-philippines/>

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Annex: Technical Skills vis-a-vis Existing TR, Soft Skills, and Emerging Skills across the Construction Sector

* Skills/Jobs with TESDA Training Regulation

² Jobs/skills needed in general construction (civil works, buildings)

¹ Jobs that may require higher education

³ Jobs/skills needed in other related industries (e.g. Oil & Gas, Energy)

Project Management	Direct Workers	Equipment (Operators and Maintenance)	Corporate/Head Office Support
<p>Job/ Skills Requirements:</p> <ul style="list-style-type: none"> ● Maintenance Technician* ● Project Manager¹ ● Construction Manager¹ ● Project Supervisors¹ ● Field Engineers¹ ● Materials Engineer¹ ● Materials Testing Technician¹ ● Quality Control Supervisors/Engineers¹ ● Document Controller ● Environment, Safety & Health Engineers/Officers ● Safety Assistants ● Community Relations Officer ● Quantity Surveyors ● Contract & Commercial Management Specialists ● Cost Engineers¹ ● Procurement & Materials Management Officer ● Material Inventory Assistants / Warehouse ● Toolkeepers ● Site HR Officers ● HR Assistants/Timekeepers ● Site Accounting Assistant ● Admin Assistant ● Equipment Dispatchers 	<p>Job/ Skills Requirements:</p> <ul style="list-style-type: none"> ● Rough Carpenters*² ● Welders* ● Pipefitters*² ● Plumbers*² ● Painters*² ● Electricians*² ● Tile Setters*² ● Tig/SMAW/GTAW Welder*² ● Scaffolders* ● Certified Scaffolders*³ ● Erection Crew/Erectors*³ ● Formworks Crew*³ ● Foreman² ● Leadmen² ● Finishing Carpenters² ● General Foremen² ● Tinsmiths*² ● Master Electrician² ● Semi Skilled Workers ● Unskilled Workers (Laborers/Helpers) ● Millwright ● Pre Cast Masons/Skilled³ ● Finishing Masons³ ● Sandblasting Crew³ ● Water Well Drilling ● Elevator installation Technician 	<p>Job/ Skills Requirements:</p> <ul style="list-style-type: none"> ● Backhoe Operators* ● Crane Operators (Tower Cranes)* ● Compactors* ● Grader Operators* ● Dump Truck Drivers* ● Transit Mixer Truck Drivers* ● Service Vehicle Drivers* ● Equipment Technician* ● Riggers*³ ● Crane Operators (Mobile)* ● Alimak Operators* ● Gondola Tenders ● Generator Set Tenders ● Tower Light Tenders ● Skid Loader Operators ● Stamping Machine Operators ● Drilling Rig Operators ● Boom Truck Drivers ● Heavy Equipment Mechanic (Advance) ● Equipment Maintenance Supervisors ● Equipment Tool Keepers ● Spotters 	<p>Job/ Skills Requirements:</p> <ul style="list-style-type: none"> ● Procurement Staff ● Accounting Staff ● Cost Planning & Control ● Tender Planning & Estimating Staff ● Treasury Staff ● Billing & Collection Staff ● Human Resource Staff ● Logistics & Support Staff ● Liaison Staff

Soft Skills

Communication Skills
Teamwork
Adaptability and Flexibility

Quality of Work
Leadership Skills
Commitment

Integrity
Accountability
Stress Management

People Handling/Management Skills
Decision Making Skills
Occupational Safety and Health

Planning and Organizing
Reading Comprehension
Work Quality

Work Methods and Work Ethics
Critical/Creative Thinking & Problem Solving

Emerging Skills

Virtual Reality
Resilience
Digital Skills

Stress Tolerance
Flexibility
5D BIM

Creative Critical Thinking
Working Remotely

Big Data Analytics
Machine Learning

People Management
Quality Control

Focus Proactive Safety
BIM Measurement

Cost Estimating, Budgeting & Control Management
Mobile for Real Time Communication



TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

Office of the Deputy Director General for Policies and Planning

Planning Office - Labor Market Information Division

Planning Office - Policy Research and Evaluation Division

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