



**Process Manufacturing, Recreational Vehicle and  
Laboratory Industry Reference Committee**

PMC Manufactured Mineral Products Training Package

# Business Case

November 2016

Prepared by  
Manufacturing Skills Australia

## A. Administrative information

**Name of IRC:** Process Manufacturing, Recreational Vehicle and Laboratory IRC

**Name of SSO:** Manufacturing Skills Australia

This business case provides evidence of the need for a full review of the PMC Manufactured Mineral Products Training Package to address current industry trends and workforce needs in the manufactured mineral products industry.

The proposed components comprise the following:

- six qualifications
- ninety-two units of competency

See the full list in Appendix A.

Description of scope of work is at Part C below.

## B. Methodology for review

### Stakeholder consultation

Following approval by the IRC, a consultant was engaged to undertake an industry wide consultation and provide recommendations for the Business Case. A targeted survey of key stakeholders was conducted. This was also accompanied by a series of phone interviews and email conversations to provide industry intelligence on skills needs, workforce directions and industry trends for each project. A full list of all stakeholders contacted can be found in Appendix B.

## C. Outcome of the review

### Imperative for change

The PMC Training Package was developed to cater for workforce development needs in the manufactured mineral products (MMP) sectors, which includes production operations in the following areas:

- cement, concrete products, glass, clay and ceramic, fibre cement and precast concrete products
- glass bottles and jars
- concrete blocks and pavers

These products are used across building and construction, civil construction, food and beverage, heavy industry and landscaping.

There has been significant retraction and amalgamation within the industry in recent years, which has seen some sectors (e.g. automotive glass and other flat glass manufacturing) disappear, and others offshore their manufacturing operations. Industry downturn, transition of the resources sector from construction to production, robotics and automation, and import competition have all contributed to reshaping sectors across the industry. Like other sectors across manufacturing, this industry has suffered from the extensive loss of the manufacturing base in Australia. The state of the

construction sector also has a strong influence on the health of MMP enterprises. At the time of this report, the precast sector was experiencing some growth in response to government initiated infrastructure projects.

The concrete manufacturing industry includes the large scale manufacture of products such as precast noise walls for freeways, bridges, walls for buildings and pipes, and the manufacture of pre-mixed concrete that is loaded into concrete trucks and sent out to be cast on building sites.

Typically, companies across this sector are not engaged in the national training system. Most of those interviewed were not aware of industry targeted MMP qualifications and did not believe national accreditation would be of value either to the company in terms of required skill development, or the individual, in terms of recognition and transferability. In some cases, the complexity of state variations also had put accredited training in the 'too hard' basket.

The precast sector is increasing its demand for training in response to contractual requirements of infrastructure projects for training history or arrangements. However, the Certificate II and III in Process Manufacturing qualifications are being preferred over the MMP qualifications to meet this requirement. This is because these qualifications are more suitable to be applied to precast work which requires skill across a single operation, rather than knowledge of end-to-end operations as required in the MMP qualifications. In addition, Process Manufacturing qualifications are more likely to be registered as traineeships, and can be completed within a shorter time frame, more suitable to short term project requirements.

There appears to be strong support for integrating the training needs of the small number of MMP users into the more flexible and applicable Process Manufacturing (MSM) qualifications.

Consultations identified the following suggestions for any development work on the MMP qualifications:

#### **Possible additional units - Suggestions from industry**

- Use of automated command batch software / processes.
- Concrete technology – how it works, cures, types, uses. What is slump? Pigments and finishes. Mixes. Flow.
- How to use / install concrete products (for the building industry)
- Precast concrete specifics.
- Mechanical maintenance for concrete plants.
- Mathematics, measurements and angles.
- Applying Australian Standards and codes of practice.

#### **Scope of work**

To address these issues, and ensure the continued success and viability of the manufactured mineral products industry, the Process Manufacturing, Recreational Vehicles and Laboratory Industry Reference Committee (IRC), through this business case, proposes:

1. Develop and test sector coverage within the MSM Process Manufacturing Certificate II, III and IV qualifications, with a view to using these as the key outcomes for the MMP sector. This includes:
  - a. Conducting thorough mapping of each sub sector's training needs to current MSM qualifications to determine gaps.
  - b. Identifying implications on packaging rules to accommodate sector needs.

- c. Consulting with industry to confirm support for establishing the MSM Process Manufacturing qualifications as the key industry training outcome
2. Develop or identify new units that cater to industry needs. This includes:
  - Working with materials and processes, (concrete technology / precast)
  - Implementing Australian Standards
  - Using batch command control systems
  - Mechanical maintenance for concrete plants
  - Mathematics, measurements and angles
3. Review and confirm PMC units which show industry support for repackaging in MSM Training Package. This includes:
  - a. Assessing whether units with between five and 25 national enrolments (over five years) should be deleted.
  - b. Conducting a mapping and comparison exercise of units with above 25 enrolments to determine which PMC units can be replaced with MSM units.
  - c. Reviewing remaining units to ensure they reflect current practice and terminology and appropriate assessment requirements.
  - d. Importing reviewed PMC units into the MSM Training Package.

## **D. Estimated impacts of proposed change**

### **Impact of implementing the changes**

Impact and benefits associated with changes proposed within this business case:

- Creation of industry defined and supported national training products
- New platforms for professional development to build sustained talent and productivity improvements within the manufactured mineral products industry
- Improved career pathways and workforce development opportunities
- Improved attraction and retention within the industry through the availability of a specialist manufactured mineral products stream within the Manufacturing Training Package aligned to specialist job roles
- Improved consistency and currency of skills for workers in the manufactured mineral products industry
- Strengthened partnerships between industry and the vocational education and training sector

### **Impact of not implementing the changes**

Impact and risk associated with no change:

- Sustained shortages of skills nationally in a growing specialist occupational area
- Increased recruitment costs and loss of productivity for employers as a result of failed recruitment efforts
- Potential loss of quality within the sector as a result of poorly/incorrectly skilled workers
- Continued lack of training and ongoing development opportunities for skill growth in a key industry area

## **E. Outstanding issues**

No outstanding issues have been identified to date. MSA will work with the IRC and the allocated SSO to ensure a smooth transition of work should this business case be approved.

## **F. Proposed approach and estimated timeframes for undertaking development work**

Training package development work will follow the standard stages of: project scoping, technical development, validation, final draft, quality check, validation and endorsement.

The recommended time to complete the work is 12 months to the time of submission for endorsement.

## **G. Training product review status**

Please see Appendix A.

## **H. IRC Signoff**

This Business Case was approved by:

Samantha Read, Chair

Date:

## Appendix A

**Schedule of Review of Training Products:** 2016-17

**SSO Name:** Manufacturing Skills Australia

**Contact details:** Samantha Read, Chair

**Date submitted:** 28 November 2016

Training Package code	Training Package name	Qualification code	Qualification name	Unit code	Unit name	Skill Set code	Skill Set name	Review status	Change required
PMC	Manufactured Mineral Products								3.4
		PMC20116	Certificate II in Manufactured Mineral Products						3.4
		PMC30116	Certificate III in Manufactured Mineral Products						3.5
		PMC40116	Certificate IV in Manufactured Mineral Products						3.4
		PMC50116	Diploma of Manufactured Mineral Products						3.4
		PMC60116	Advanced Diploma of						3.4

			Manufactured Mineral Products					
		PMC80116	Graduate Certificate in Refractories Engineering					3.4
				MSMPMC3XX	Working with materials and processes			New
				MSMPMC3XX	Implementing Australian Standards and Codes of Practice			New
				MSMPMC3XX	Using batch command control systems			New
				MSMPMC3XX	Mechanical maintenance for concrete plants			New
				MSMPMC3XX	Mathematics, measurements and angles			New
				PMC562083	Allocate and complete team tasks			3.5
				PMC555030	Analyse equipment performance			3.5
				PMC554091	Analyse refractory failures			3.5
				PMC552056	Assemble, fabricate and place reinforcement			3.5

				PMC552060	Batch mix concrete				3.5
				PMC563081	Carry out stock control				3.5
				PMC552052	Cast moulded concrete products				3.5
				PMC555031	Choose materials for an application				3.5
				PMC552055	Conduct benching operations				3.5
				PPMCP330	Co-ordinate the shutdown of coated paper processes				3.5
				PMC552061	Deliver concrete to site				3.5
				PMC562081	Deliver customer service				3.5
				PMC552058	Demould concrete products				3.5
				PMC557091	Design a refractory lining				3.5
				PMC557093	Design a refractory/ceramic component				3.5
				PMC553070	Design and construct moulds for fibrous plaster products				3.5
				PMC554020	Design and prepare models, moulds and				3.5



					dies				
				PMC556031	Design structural/mechanical components				3.5
				PMC552057	Finish casting operation				3.5
				PMC552053	Finish cured concrete products				3.5
				PMC552051	Finish green concrete products				3.5
				PMC552023	Finish products after firing				3.5
				PMC552024	Hand mould products				3.5
				PMC552007	Heat accelerate the curing of precast concrete				3.5
				PMC557094	Investigate refractory failures				3.5
				PMC557001	Manage trials				3.5
				PMC553072	Model fibrous plaster products				3.5
				PPMCP210	Monitor and control coated paper processes				3.5
				PMC562070	Move materials				3.5
				PMC552010	Operate a calcining kiln				3.5

				PMC552030	Operate a firing kiln				3.5
				PMC552006	Operate an autoclave				3.5
				PMC552042	Operate blown insulation equipment				3.5
				PMC562071	Operate bulk materials handling equipment				3.5
				PMC552045	Operate container forming equipment				3.5
				PMC552008	Operate crushing equipment				3.5
				PMC552002	Operate equipment to blend/mix materials				3.5
				PMC552031	Operate extrusion equipment				3.5
				PMC552044	Operate fibre forming equipment				3.5
				PMC552043	Operate float forming equipment				3.5
				PMC552070	Operate forming equipment				3.5
				PMC552048	Operate glass finishing equipment				3.5
				PMC552040	Operate glass melting process				3.5
				PMC552046	Operate glass printing equipment				3.5

				PMC552003	Operate grinding equipment				3.5
				PMC552021	Operate manual glazing equipment				3.5
				PMC552049	Operate on-line stacking and assembly equipment				3.5
				PMC552032	Operate pressing equipment				3.5
				PMC552047	Operate primary annealing equipment				3.5
				PPMCSK310	Operate process control equipment				3.5
				PMC552041	Operate process ovens				3.5
				PMC552020	Operate slip casting equipment				3.5
				PMC561080	Organise self				3.5
				PPMCP320	Prepare and start up coated paper processes				3.5
				PMC552065	Prepare asphalt				3.5
				PPMCPR210	Prepare chemical products				3.5
				PMC552094	Prepare for and apply shotcrete for installation				3.5

				PMC552093	Prepare for and cast refractory materials				3.5
				PMC552092	Prepare for and install mouldable refractory materials				3.5
				PMC552004	Prepare for production				3.5
				PMC552095	Prepare for, install and repair ceramic fibre				3.5
				PMC552091	Prepare for, install and repair refractory brickwork/blockwork				3.5
				PMC552022	Prepare materials for clay and ceramic production				3.5
				PMC553020	Prepare moulds and dies				3.5
				PMC552005	Process greenware/green products				3.5
				PMC553010	Process raw meal into product				3.5
				PMC553050	Produce architectural precast concrete				3.5
				PMC552072	Produce fibrous plasterboard				3.5
				PMC553051	Produce structural				3.5

					precast concrete				
				PMC552050	Schedule, cut and bend reinforcement				3.5
				PMC557090	Select refractory materials for an application				3.5
				PMC553080	Set up and optimise finishing process				3.5
				PMC553040	Set up and optimise glass forming process				3.5
				PMC553041	Set up and optimise glass furnace process				3.5
				PMC553042	Set up and optimise secondary process				3.5
				PMC553000	Set up and tune a process				3.5
				PMC553021	Set up and tune glazing equipment				3.5
				PMC557092	Specify and interpret refractory tests				3.5
				PMC557097	Specify and monitor repairs to refractory installations				3.5
				PMC557096	Specify and monitor the installation of block/precast refractories				3.5
				PMC557095	Specify and monitor				3.5

					the installation of monolithic/castable refractories				
				PMC557098	Specify refractory installation systems				3.5
				PMC552054	Spin concrete pipes				3.5
				PMC561072	Store materials for production				3.5
				PPMCP440	Troubleshoot and rectify coated paper processes				3.5
				PMC554090	Undertake simple refractory design				3.5
				PMC552090	Use and maintain tools and equipment for refractory operations				3.5
					<b>Total qualifications</b>	6			
					<b>Total Units of Competency</b>	92			
					<b>Total Skill Sets</b>	0			

## Appendix B

<b>Manufactured mineral products stakeholder list</b>	
<b>Name</b>	<b>Organisation</b>
Gary Blackburn	Neil Mansell Concrete
Brent Hardy	Duggans Precast
Wendy Wright	Delta Corporation Limited
Damien Davies	Boral
Deborah Evans	PGH Bricks and Pavers
Greg Farmer	PGH Bricks and Pavers
Rick Terpstra	CSR Limited
Patrick Krause	Krause Bricks
Danny Murphy	Boral Cement Work
Andrew Richie	Hanson Australia (Holdings) Pty Ltd
Phil Stevenson	Hanson Australia (Holdings)
Peter Webb	Hanson Precast
Ricky Elatm	Holcim Pty Ltd – Lidcombe Concrete
Tony Truscott	Orora Glass
Con Sahinis	Rocla
Robyn Holt	Midland Brick
Kalvin Bartlett	Alan Bartlett Consulting Pty Ltd
Bryce Coventon	Performance Training Pty Limited (QLD)
Leon Drury	MSA NSW ITAB
Archie Wright	Industry Skills Advisory Council NT
Sonja Malcolm	Western Sydney TAFE
Leanne Hixon	QMI Solutions
Margie Thomson	National Precast Concrete Association Australia (NPCAA)
Michael Magee	Skills Tasmania
Elizabeth McIntyre	Think Brick Australia AKA Concrete Masonry Association of Australia (CMAA)
Erica Smith	Federation University
Ken Slattery	Cement Concrete and Aggregates Australia (CCAA)
Nicole Raymond	Australian Concrete Repair Association (ACRA)
Paul Saunders	Chisholm Institute
Michael Swan	Training Prospects – SA
Guy Valentine	Department of Education, Training and Employment (DETE)
Matt	DTWD

Andrew Ruffles	Concrete Pipe Association of Australasia (CPAA)
Jason Walsh	Delta Corp (WA)
David Millar	Concrete Institute of Australia
Wally Klukiewicz	Austral Bricks
Wendy Gains	Austral Bricks
Bill Swerlowycz	Brikmakers
Sean Joseph	Hy-Tec
Tu Bui	Adelaide Brighton Cement Ltd
Trudy Potts	Flat Glass Industries Limited
Erin Hurley	Cement Australia Railton (Tasmania)
Mark Harper	Utilities, Engineering, Electrical and Automotive Training Council (WA)
Jamie Mackaway	Resources Industry Training Council
Adam Briand	James Hardie
Melanie Taylor	O-I Owens-Illinois Australia
Lee Carter	Department of Education and Training VIC