

41319**Design a master key system manually**

Kaupae Level	4
Whiwhinga Credit	10
Whāinga Purpose	This skill standard is intended for people who are working in the locksmithing industry. Learners credited with this skill standard will be able to apply master keying principles and rules to manually design a three-tier master key system that meets security and operational requirements. This skill standard aligns with the New Zealand Certificate in Locksmithing (Trade) (Level 4) [Ref: 2718].

Hua o te ako me Paearu aromatawai | Learning outcomes and assessment criteria

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Explain master keying principles, terminology and rules of design for a master key system.	a. Use correct terminology relevant to master key systems.
	b. Identify system limits and vulnerabilities in a master key system.
	c. Explain the foundational rules of design for a master key system.
	d. Explain legal requirements and ethical responsibilities relating to master key systems.
2. Create a three-tier design from a level four master key system.	a. Map areas and doors to a three-tier hierarchy to meet specified access requirements.
	b. Select appropriate Main Perm.
	c. Create a progression chart.
	d. Generate biting array.
	e. Generate 64 change key matrix.
	f. Identify and mark out any bad codes.

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
3. Select key codes and produce pinning charts for the planned master key system.	a. Assign codes to keys as per keying matrix.
	b. Identify and mark out all ghost codes and resolve all phantom keys.
	c. Produce pinning charts to correspond to the keying matrix.
	d. Identify and mark out all incidental master keys.
4. Complete customer records for planned master key system.	a. Complete customer records accurately for a master key system.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

- Evidence presented for assessment against this skill standard may be achieved using a hypothetical scenario. Learners are not required to create a master key design for an actual customer.
- Evidence presented for assessment against this skill standard must be consistent with safe working practices and be in accordance with applicable service information, workplace procedures and legislative requirements.
- It is recommended that people hold credits for unit standard 22455, *Assemble and test key mechanisms* and unit standard 12912, *Design residential and light commercial locking systems* before being assessed against this skill standard.

Definitions

Locksmithing terminology is defined as per MLAA glossary:

Bitting refers to a potential key. These numbers represent the cuts of a key.

Bitting Array refers to a table which shows all potential cuts to be generated from a chamber, the order that chamber is to be progressed and the designations of the keys produced from that chamber.

Change key refers to a key which has no keys or codes below it in the hierarchy.

Depth steps refer to the minimum difference between useable depths. Set at the creation of the system, this will dictate the number of unique codes which can be produced from a chamber.

Foundational rules of design refer to highest cut rule (MP only), deepest cut rule (MP only), odd/even rule (MP only), same cuts rule, total variation rule, descending cuts rule, MACS rule.

Ghost refers to a bitting which if cut, will become a phantom. Ghost may also refer to codes reserved for future use.

Incidental Master Key refers to a master key which utilises Main Perm cuts in positions also used to generate Change Keys.

Level four system refers to a system where four positions are progressed.

MACS refers to Maximum Adjacent Cut Specification.

Master Key refers to any key which has keys or codes below it in the hierarchy.

Main Perm (MP) refers to the highest level code the system is derived from.

MLAA refers to Master Locksmiths Association of Australasia.

Phantom refers to a key which utilises existing shearlines to operate locks it is not authorised to operate.

Pinning refers to the specific combination of pins contained within a cylinder to allow the authorised keys to operate.

Progression chart refers to a schedule detailing the designation, depth steps and sequence of progression for each progressed chamber.

Workplace procedures refer to organisation policies and procedures that are documented in memo, electronic, or manual format and available in the workplace. They may include but are not limited to – standard operating procedures, site specific procedures, site safety procedures, equipment operating procedures, quality assurance procedures, product quality specifications, manufacturer's requirements, references, approved codes of practice, housekeeping standards, environmental considerations, on-site briefings, supervisor's instructions, and procedures to comply with legislative and local body requirements relevant to the locksmithing industry.

***Ngā momo whiwhinga* | Grades available**

Achieved

Ihirangi waitohu | Indicative content

Master key principles and rules of design

- Correct use of master keying terminology as per MLAA glossary.
- Legal and ethical requirements – signatories.
- Responsibilities – record keeping, storage and access.
- Hierarchies – Grand Master Key, Master Key and Change Key.
- Shear lines.
- Security and access control principles.
- Plan for expansion and change.
- Manufacturer limits and specifications.
- Restricted and unrestricted systems.
- Stamping conventions.

Rauemi | Resources

Legislation, regulations and industry guidelines relevant to this skill standard include but are not limited to:

- Health and Safety at Work Act 2015.
- Privacy Act 2020.
- Master Locksmiths Association Australasia. (current version). *MLAA Glossary of Master keying Terms*. Available from: <https://masterlocksmiths.com.au/>.

Pārongo Whakaū Kouna | Quality assurance information

Ngā rōpū whakatau-paerewa Standard Setting Body	Manufacturing and Engineering Industry Skills Board
Whakaritenga Rārangi Paetae Aromatawai DASS classification	Engineering and Technology > Mechanical Engineering > Locksmithing
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga CMR	0014

Hātepe Process	Putanga Version	Rā whakaputa Review Date	Rā whakamutunga mō te aromatawai Last date for assessment
Rēhitatanga Registration	1	28 May 2026	N/A
Kōrero whakakapinga Replacement information	N/A		
Rā arotake Planned review date	31 December 2031		

Please contact Manufacturing and Engineering Industry Skills Board at qualifications@maeisb.nz to suggest changes to the content of this skill standard.