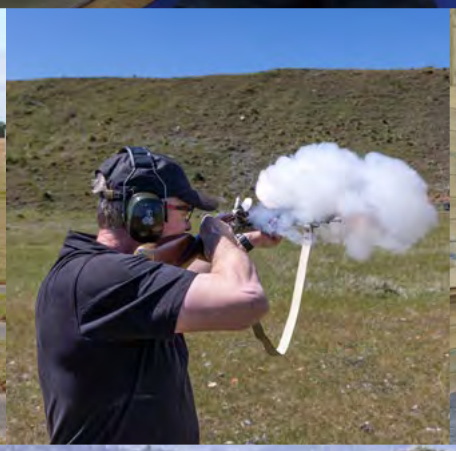
Te Tari Pūreke
Firearms Safety Authority

New Zealand Police

Shooting Range Manual



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1 October 2025
Te Tari Pūreke – Firearms Safety Authority, a business unit of New Zealand Police


icon design

Preface

About this manual

1 This manual contains the standards required by the Commissioner for the design, construction and safe operation of shooting ranges in accordance with the Arms Act 1983 and the Arms Regulations 1992.

2 This version of the New Zealand Police shooting range manual dated 1 October 2025 is approved by:
Inspector Peter (PGR) Baird
Manager Compliance
Te Tari Pūreke – Firearms Safety Authority
Acting under delegated authority of the Commissioner of Police

3. This manual uses mandatory language such as 'must' and 'is/are to' in order to meet the required safety standards of the Arms Act 1983.

4. Examples of how to comply with the requirements, or recommendations for good practice, are indicated with non-mandatory language such as 'may', 'should' or 'could'.

Table of Contents

GLOSSARY

Active range area	The area in which shooting activity is conducted on a range, including the danger area applied to the range.
Angle of departure (Quadrant elevation)	The angle formed between a horizontal line and the centreline of the bore at the moment the projectile leaves the muzzle of the firearm. Angle of departure is also known as quadrant elevation (QE) and is used in the design of an ammunition danger area template.
Ammunition danger area template (ADAT)	A template is an area into which direct fire and ricochet is expected to fall. An ammunition danger area template is a technical drawing of an approved ammunition (including its respective ballistic characteristics) from a single firearm to a single target in a single direction of fire (range axis), drawn to a given scale. This drawing is then applied to a topographic map to establish the range danger area.
Angular measurement	Angular measurement used in this manual are: 1. 360 degrees = 6400 NATO mils. 2. 1 degree = 17.77778 NATO mils. 3. 1 NATO mil = 0.05625 degrees.
Backsplash	Backsplash is defined as projectile fragments, target materials, or ground debris, thrown back towards the shooter as a result of projectile impact.
Calibre	The diameter of a firearm bore measured across the lands (excluding the depth of the rifling grooves) and the diameter of a projectile.
Contour line	A line drawn on a map at a consistent height above mean sea level (AMSL) throughout its length that represents the three-dimensional shape of the ground.
Deterministic safety analysis	A traditional approach for developing an ammunition danger area applied to a range. It requires the calculation of a combination of predetermined factors to create a generic danger area. The ammunition danger area is applied from every firing position to every target position to calculate the overall range danger area.
Duty Officer(DO)/Officer on Duty (OD)/ Range Officer (RO)	A person who holds a firearms licence and has received appropriate training in shooting range safety management. The DO/OD/RO must also hold the appropriate endorsement for the type firearm being used on the shooting range (if applicable). The duty officer (DO) may also be known as the officer on duty (OD) or range officer (RO).
High velocity	High velocity is ammunition that leaves the firearm at a muzzle velocity of 2,148 feet per second (fps) or greater.
Impact surfaces	Impact surfaces are all surfaces within the cone of fire that are likely to be struck. Impact surfaces are categorised as: 1. Hard impact surfaces Include concrete, rock, steel, water and frozen surfaces. 2. Ground impact surfaces, which are all surfaces other than hard impact surfaces. The composition and depth of the ground (including topsoil and vegetation) in some regions may allow for the ricochet angle to be reduced if it is deemed safe to do so by the shooting range operator.
Low velocity	Low velocity is ammunition that leaves the firearm at a muzzle velocity no greater than 2,148 feet per second (fps).
Mantlet	A range structure on a gallery range that is designed to capture the bottom of the cone of fire.

Probabilistic safety analysis	Requires the collection and input of data within a probabilistic safety analysis software program recognised by Police. Danger areas calculated are specific to a range and may be smaller than those generated by deterministic safety analysis.
Range design cone of fire (CofF)	The cone of fire is the distribution of fired projectiles within a margin of error in the vertical and horizontal planes. Cone of fire is applied above, below and to either side of the point of aim and is critical in determining the design specification of a range.
Range axis (Direction of fire)	The primary bearing from which all range design geometry is derived. This is commonly referred to as the direction of fire.
Ricochet	A ricochet is the change of direction and velocity induced in a projectile or fragment caused by its impact with a material. For high velocity (at least 2,148 fps) ammunition could ricochet from 30 degrees off ground impact surfaces and 45 degrees off hard impact surfaces. For low velocity (less than 2,148 fps) ammunition could ricochet from 15 degrees off ground impact surfaces and 45 degrees off hard impact surfaces. It is accepted that high velocity ammunition fired over long distances will reduce to low velocity and a low velocity ricochet could occur off the respective impact surface as described above.
Range inspector	A person recognised by the Commissioner who can conduct shooting range inspections, this person must be a member of the Police and authorised in writing by the Commissioner. Only members of the Clubs and Ranges Team will hold this written authority (formerly known as a shooting range inspector (SRI).
Shooting range operator (SRO)	The person who is operating or proposing to operate a shooting range.
Temporary non-pistol shooting range	Is a range used no more than two times in a calendar year for no longer than four days of shooting activities.

FIGURES AND TABLES

ABBREVIATIONS

AofF	Arc of fire
ADH	Air danger height
ADAT	Ammunition danger area template
CAA	Civil Aviation Authority
CofF	Cone of fire
deg	degrees
DO	Duty Officer
FDA	Full danger area
GB	Grid bearing
GR	Grid reference
h/w	Hard wood
mils	NATO mils (angle of military measurement)
NDA	No danger area
OD	Officer on duty
RCEG	Range Certification Engagement Group
SRI	Shooting range inspector
SRO	Shooting range operator
RDA	Reduced danger area
RO	Range officer
RSOs	Range standing orders
s/w	Soft wood
TCH	Target centre height

Section 1

Section 1
Shooting Ranges

Introduction

1.1 This shooting range manual represents the standards required by the Commissioner for the design, construction and safe operation of shooting ranges. The purpose of this manual is to provide design and construction criteria for shooting ranges, e.g. pistol, rifle, shotgun, airgun shooting ranges.

1.2 The manual describes and explains:

a. The safe design and construction of shooting ranges
b. The components of shooting range design and construction
c. Shooting range danger areas, signage and flags
d. Range standing orders
e. Shooting range closure
f. Zeroing (sighting-in / sight adjustment).

1.3 Prior to planning and developing a new shooting range or making a significant change (affecting the ballistic design) of an existing shooting range, it is recommended that contact is made with the Clubs and Ranges Team for guidance and advice at ClubsandRanges@police.govt.nz.

This range manual provides the New Zealand sport and target shooting community and members of the New Zealand public with requirements for the design, construction and safe operation of shooting ranges.

Legislative requirements for shooting ranges

1.4 Information on the legislative requirements for shooting ranges can be found at Te Tari Pūreke Firearms Safety Authority website / Manage and Apply / Clubs and Ranges.

Legislative compliance requirements for shooting clubs and ranges

1.5 Information on the legislative compliance requirements for shooting clubs and ranges can be found at Te Tari Pūreke Firearms Safety Authority website / Manage and Apply / Clubs and Ranges.

Application / Submission / Notification forms

1.6 The forms required to administer the legislative requirements listed above can be downloaded from Te Tari Pūreke Firearms Safety Authority website / Manage and Apply / Clubs and Ranges.

All ranges must be designed, constructed, operated and maintained to ensure the safety of both participants and non-participants at the shooting activity

Section 2


Backstop
Side Wall
Side Wall
Range Floor
Bullet Catcher
Target Line
Slope Angle
34°
Minimum 30° (Critical)

Section 2
Design and construction of a shooting range

Design and construction of a shooting range

2.1 The key objective for the design and construction of a shooting range is that projectiles and any ricochets are contained with the active range area (the area in which shooting activity is conducted on a range, including the danger area applied to the range). This is achieved by containing the cone of fire and any necessary margin of error for the type of shooting activity carried out on the range.

Shooting range design guidance

2.2 This section sets out the core requirements and recommendations for the design and construction of a shooting range.

Shooting range design and construction techniques

2.3 The following information provides examples of shooting range design and construction techniques that can be used for a variety of shooting activities and may be customised for specific shooting disciplines. When developing this manual, national shooting organisation range manuals were used to reference range design and construction techniques specific to individual target shooting activities. These national shooting organisations are listed in section 8.

Generic shooting range design

2.4 A generic shooting range design provides a flexible framework suitable for multiple shooting disciplines, skill levels, and firearm types. Core components typically include firing points, firing lines, firing lanes, a range floor, a target line(s), a bullet catcher, a backstop, and a defined range danger area. Additional structures may incorporate covered firing points, target mechanisms, side berms, side walls, and baffles to enhance safety and functionality. All ranges must operate under approved and up-to-date range standing orders to ensure compliance and safe use.

Outdoor pistol/rifle shooting ranges

2.5 Outdoor pistol and /rifle shooting ranges are designed for target shooting at various distances using pistol and rifle firearms. Some ranges are designed for the use of both pistol and rifle while others are for the use of pistol or rifle only. Where a range is used for both pistol and rifle the ammunition danger area template for the largest high velocity rifle calibre must be applied (unless a no danger area range). The follow describes specific detail on each type of range:

a. **Pistol Shooting Range**. Any range on which a pistol is approved for use is defined as a Pistol Shooting Range and must have a valid pistol shooting range certificate to operate. A pistol shooting range is designed for firing pistols at static and/or reactive (steel) targets and has a firing line(s), a target line(s), a bullet catcher, a backstop, a side and may have where applicable, a side backstop(s), a side berm(s), a side wall(s), a covered firing line, a covered target line, a canopy, baffles. Ballistic range structures or features are designed and constructed to cater for the firing of low velocity firearms and ammunition unless the range allows for the use of high velocity firearms.

b. **Rifle Shooting Range**. Any range on which a rifle is approved for use is defined as a Non-pistol Shooting Range and must have a valid letter of enrolment to operate. A rifle shooting range is designed for firing rifles at soft (paper) or hard (steel) targets. Range features and structures are the same as for pistol shooting ranges however firing distances can range from 50 metres up to 1000 yards or more for field shooting rifle ranges. Ballistic range structures and/or features are designed to cater for the use of high velocity firearms and ammunition.

For additional information not contained in this manual, contact the Clubs and Ranges Team at ClubsandRanges@police.govt.nz

Figure 2.1 – Examples of rifle ranges

Figure 2.2 – Examples of pistol ranges

Gallery range

2.6 A gallery range is an outdoor reduced danger area range, constructed in yards or converted fully or partially to meters, with firing lines typically spaced at 100-yard or 100-metre intervals, up to 600 yards or metres. To apply the reduced danger area, the range must have compliant firing lines, range floor, mantlet, markers' gallery, and backstop. A common layout includes up to 12 firing lanes, each 4 meters wide. Targets are either manually operated by personnel in the markers' gallery or replaced with electronic target systems (see figure 2.3).

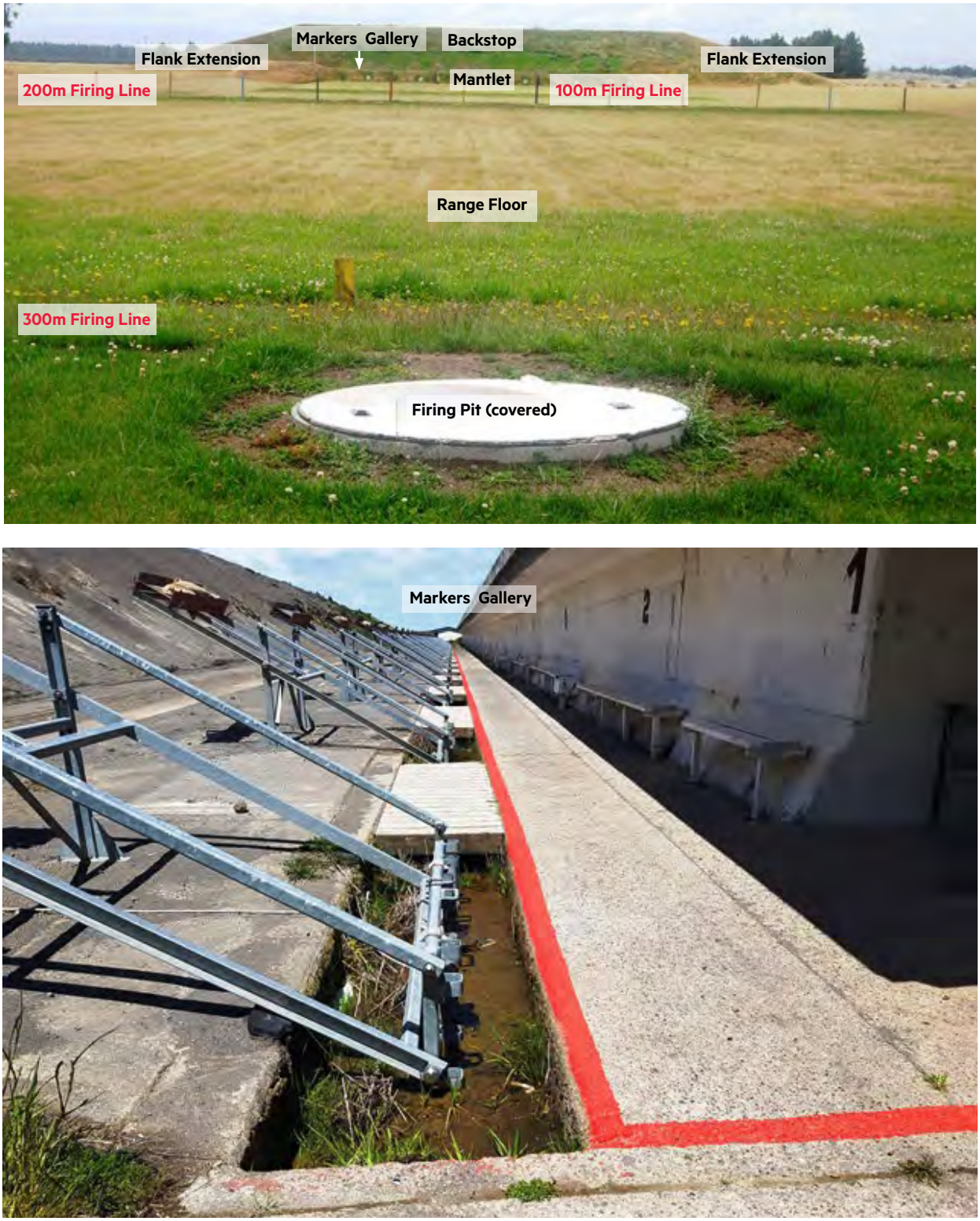
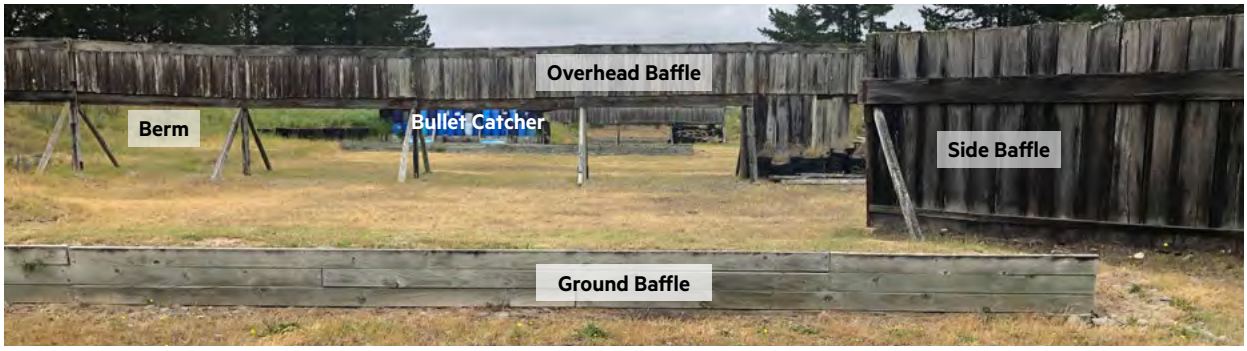
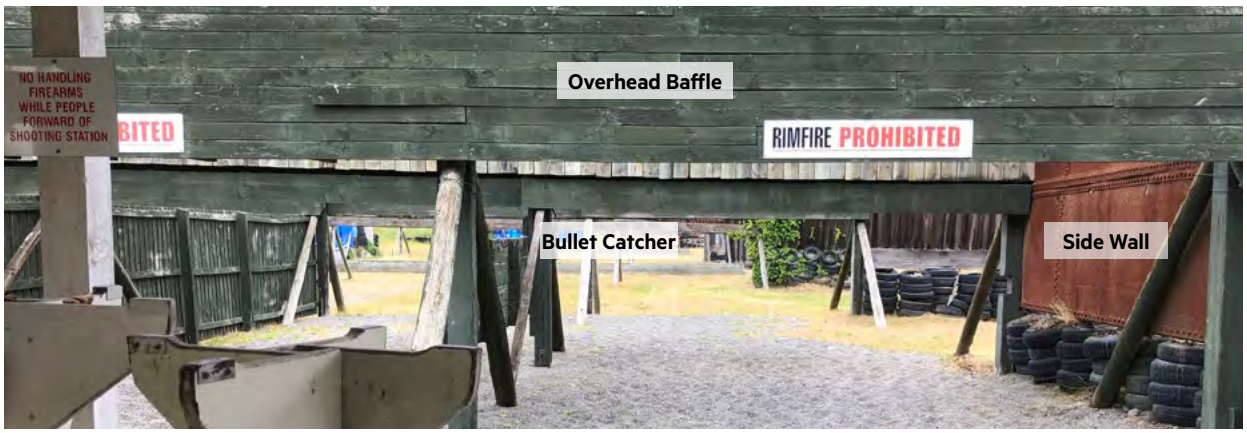


Figure 2.3 – Examples of gallery ranges

Baffle range

2.7 A baffle range may have baffles on either side of the range floor, above the range floor, on the range floor, or a combination of these. Baffles are commonly used on no danger area (NDA) ranges to ensure all correctly aimed shots and ricochets are contained (see figure 2.4). Baffles are positioned to mitigate the potential for ricochets to exit the range and therefore meet the criteria for a NDA range. If the criteria for a NDA range cannot be met, an appropriate danger area must be determined and applied to the range. Construction materials of baffles and cladding must be appropriate for the calibre of firearm to be used on the range and be regularly maintained (refer to tables 3.6 and 3.7 of section 3).





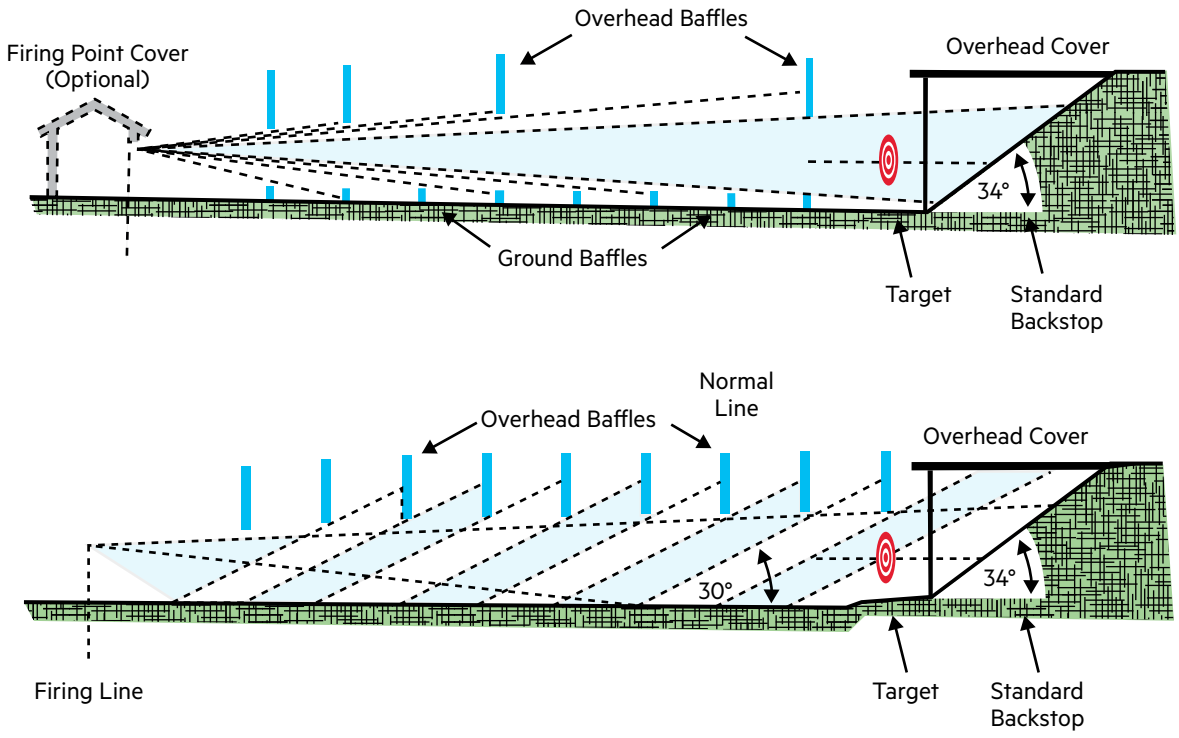


Figure 2.4 – Examples of baffle ranges

Shotgun ranges

2.8 Shotgun ranges have mechanical mechanisms (traps) to throw frangible targets (aerial clay targets) from an arrangement of shooting stations from which shooters engage these targets. The targets are thrown on fixed flight paths or within specified arcs. A shotgun range includes a downrange danger area (formally known as a Shot-fall Safety Area) designed to contain all shot fired during approved shooting activities and is dependent on the use of steel or lead shot (steel shot may be used to achieve a reduced range danger area or to comply with environmental consents). Two types of shotgun ranges include:

a. **Skeet and trapshooting range**. Skeet and trapshooting ranges are designed for firing shotguns at moving (aerial) clay targets. A range complex may combine Trapshooting and Skeet Ranges (also known as fields) in one layout and includes range structures required by the individual discipline. A range can consist of both a skeet field and and trapshooting field and will have a common danger area. Aerial clay targets are thrown on fixed flight paths or within specified arcs (see figures 2.5, 2.6 and 2.7). There are other types of trapshooting disciplines that can be conducted on a trapshooting range e.g., ball trap, running rabbit, sporting, compak and universal trench.

Figure 2.5 – Examples of skeet (field) ranges

Figure 2.6 – Example of a down the line (DTL) Trapshooting (field) range

Figure 2.7 – Example of a combined skeet and down the line (DTL) trapshooting (field) range with an ammunition danger area template applied to establish the range danger area

b. **Sporting clay range.** Sporting clay ranges are established with different shooting scenarios configured to simulate hunting type settings. The typical sporting clay range consists of various shooting stations laid out in a circuit or configured around multi-station towers. Each station consists of a shooting position that may include a shooting stall or frame, and a target thrower(s) designed to throw frangible aerial clay targets on a specific flight path or within specified arcs (see figures 2.8 and 2.9).

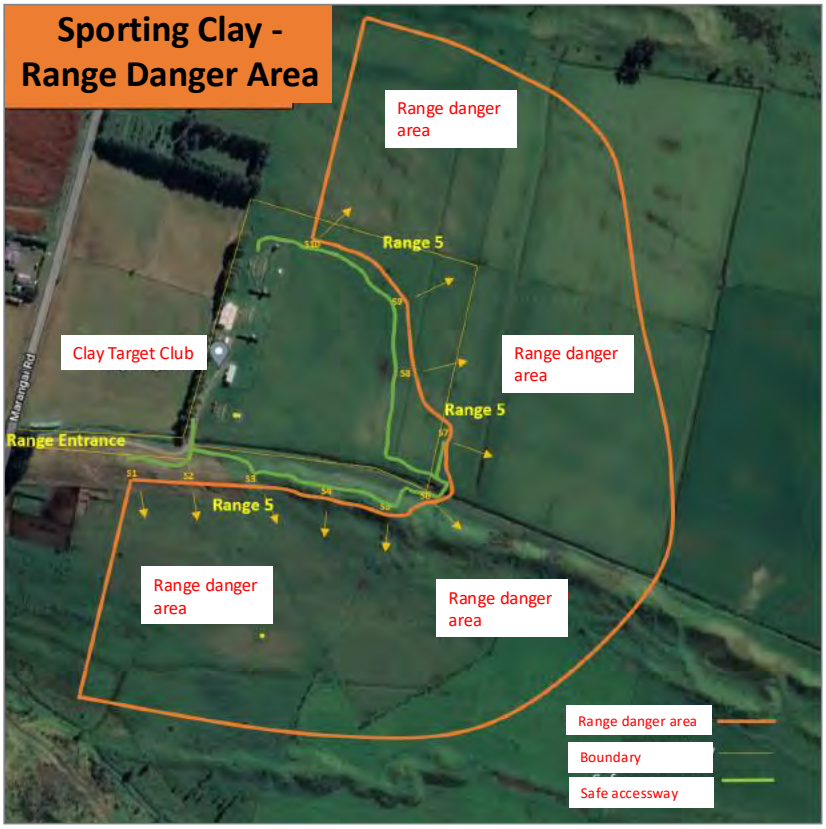


Figure 2.8 – Example of a sporting clay shooting range (without shooting stalls) with an ammunition danger area template applied to establish the range danger area.

Figure 2.9 - Example of a sporting clay shooting range.

Indoor shooting range

2.9 Indoor ranges present ballistic and potential environmental considerations for the designer. The range building must contain all shot without causing damage or injury from ricochet or backsplash. Environmental considerations include noise, particularly reverberation, airborne contaminants including lead and carbon monoxide pollution, and unburned propellant. Existing indoor ranges are generally designed with a maximum range of 25 yards or 25 meters, but purpose-built indoor ranges designed to meet specific requirements can be constructed. Traditional indoor ranges typically accommodate smallbore firearms, such as .22 inch (5.6 millimetre) rifles firing subsonic soft lead projectiles, and airguns using .177/.22 inch (4.5/5.58 mm) pellets. A traditional range will usually consist of firing lines (or mounds) at 25 yards or meters, and at 10 meters, firing lanes, an unobstructed range floor, a target line, a bullet catcher, back plate, and defence zone (see figure 2.10).

Figure 2.10 – Examples of indoor ranges

Field shooting range

2.10 Field shooting ranges are designed to replicate outdoor environments through varied shooting scenarios. These ranges typically feature a circuit of shooting stations, each positioned to engage designated target locations. Stations may include shooting positions with facades or rests to simulate realistic field conditions. Infrastructure is usually minimal or absent; the range is set up prior to use and dismantled afterward. The location and any compliant topographic features play a key role in determining the type of danger area to be applied. (see figure 2.11).

Figure 2.11 – Example of field shooting ranges

Black powder range

2.11 Whilst black powder firearms (including black powder mortars and canons) can be used on most outdoor ranges if approved by a range operator, a black powder range is designed for specific black powder shooting activities. These activities include muzzle loading and black powder cartridge firearms shooting at static and moving targets. The location and any compliant topographic features play a key role in determining the type of danger area to be applied. Range features may include firing lines, firing lanes, a target line, a bullet catcher, a backstop, and a danger area (see figure 2.12).

Figure 2.12 – Example of a black powder shooting range

Section 3

Section 3
Components of shooting range design and construction

Introduction

3.1 A shooting range is designed to accommodate the largest firearm calibre and ammunition approved for use on the range. This section outlines principles from the New Zealand shooting community and international best practices, along with key features and components for the design and construction of shooting ranges.

Range design cone of fire (CofF)

3.2 The cone of fire is the distribution of fired projectiles within a margin of error in the vertical and horizontal planes (see figure 3.1). For design purposes the CofF is applied from the firing point/line to the target centre. The CofF accounts for acceptable deviation caused by errors associated with the firer, machining or manufacturing tolerances of the firearm and/or ammunition and and allows an additional margin for acceptable firer error (see figure 3.3). For shotguns firing 'shot', shot-spread is used instead of CofF. Respective shot-spread must be directed within the designated arcs of fire to ensure all shot is contained within the range danger area for the shooting activity .

3.3 The range design cones of fire listed in table 3.1 are applied from 100m or the furthest firing distance if less than 100m. Approved range design cones of fire must be listed in the range standing orders.

3.4 The shooter must demonstrate their ability to achieve the range design CofF to the satisfaction of the Duty Officer/ Officer on Duty/Range Officer, before progressing to further shooting distances. This procedure is to be detailed in range standing orders.

3.5 Any variation to the range design cones of fire listed in table 3.1 must be approved by Clubs and Ranges.

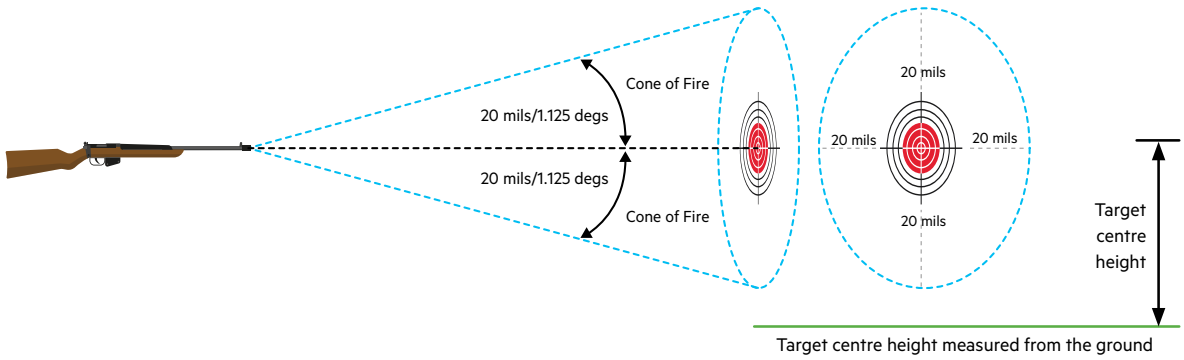


Figure 3.1: Example of a cone of fire around point of aim and target centre height dimension

Range design cones of fire (see note)		
Range	Cone of fire	Notes
Pistol range	23 mils (1.3 deg)	All pistol shooting disciplines
Outdoor rifle range	20 mils (1.125 deg)	Includes blackpowder rifle and shotgun
Indoor/Outdoor small-bore rifle and airgun range	10 mils (0.563 deg)	

Note: Any variation to these cones of fire refer to paragraph 3.5

Table 3.1 – Range design cones of fire

Range axis (direction of fire)

3.6 The range axis can be measured by obtaining a bearing from a compass or global positioning system (GPS) in the direction of fire and plotting it onto a map. This bearing is used as the range axis to determine the range design geometry and range danger area.

Backstops

3.7 The backstop is the area extending above and to the sides of the bullet catcher and should be subjected to lesser concentrations of fire. Its purpose is to stop direct shot in free flight and ricochet from the predicted first point of impact. Typical construction used for backstops include vertical walls, natural earth embankments, man-made structures and/or cutting into natural hill feature.

3.8 The criteria for a no danger area range backstop refer table 3.2 of this section.

3.9 The criteria for a reduced danger area backstop refer to paragraph 4.9 of section 4.

3.10 Backstops are not required for full danger area ranges.

3.11 Where practicable, a backstop is to be established parallel to the firing line(s), target line(s), and bullet catcher, however a maximum deviation of 10 degrees from the range axis is permitted.

3.12 The backstop may be constructed of a solid inert core material, however, the forward slope must be covered by suitable fill material (e.g. sand, soil, aggregate) measured from the horizontal (line of fire):

a. **Low velocity** - Fill material depth behind targets is to be no less than 500mm measured parallel from the horizontal or line of fire.

b. **High velocity** - Fill material depth behind targets is to be no less than 900mm measured parallel from the horizontal or line of fire.

3.13 The forward slope angle of the backstop is to be established at no less than 34 degrees. This angle may reduce over time with natural settlement of the fill material, projectile impact, tunnelling, and weathering. The slope must never be allowed to fall below 30 degrees, whereby it must be re-established back to 34 degrees (see figure 3.2).

3.14 Vegetation (grass, shrubs, and trees) are not to be considered when calculating the height of a no danger area backstop.

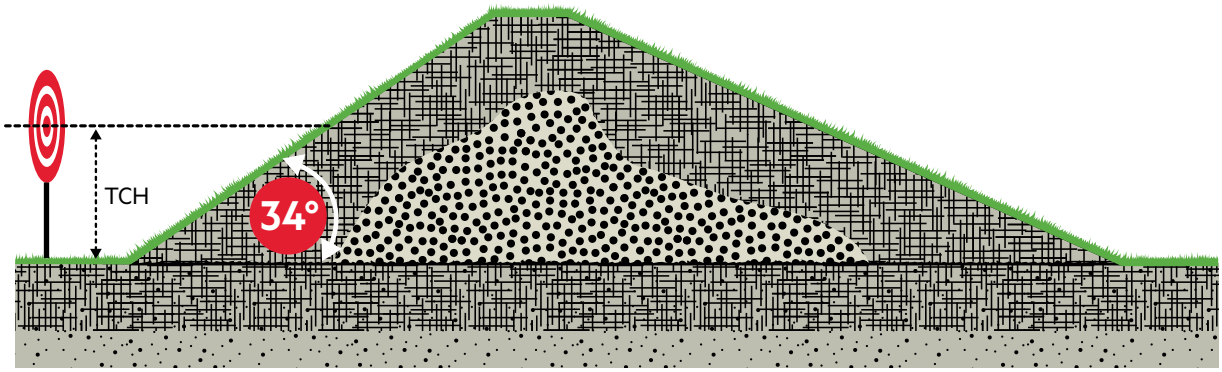


Figure 3.2 : Backstop slope angle

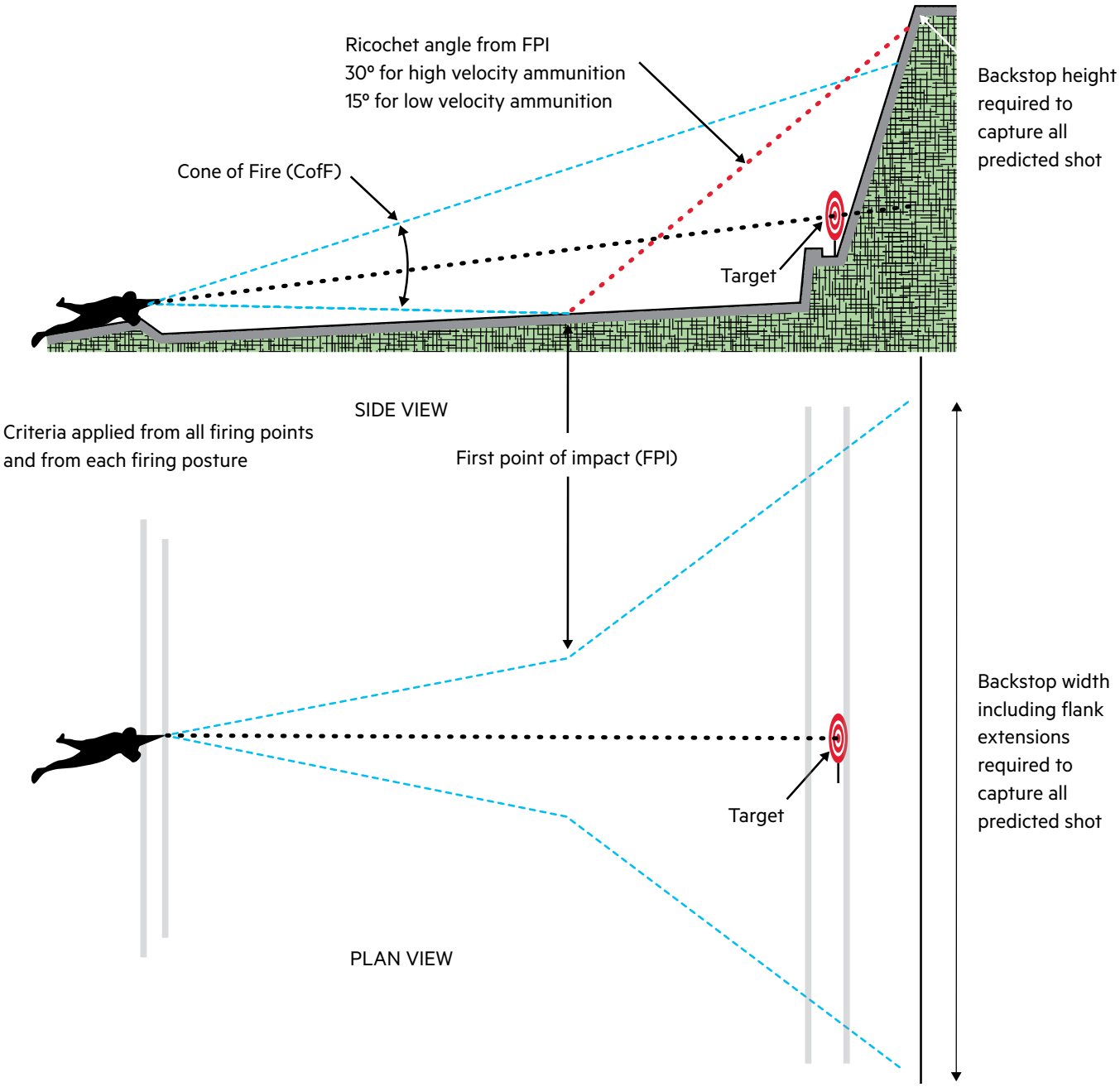


Figure 3.3: Backstop designed to capture CofF and range floor strike from the first point of impact (FPI) and the resultant ricochet

Outdoor/indoor no danger area (NDA) range backstop dimensions - airgun/rimfire
(up to a firing distance of 100 metres) (For firing distances over 100 metres refer to section 4)

Indoor airgun/rimfire			
Firing distance to target line (m)	10	25	TCH
Single (1) tier firing mound – (1m in height from range floor)			
Height (m)	1.5	1.5	1
Two (2) tier firing mound - (3m in height from range floor)			
Height (m)	3.5	3.5	3
Flank extension beyond target (m)	0.5	0.5	

0.22LR Rimfire rifle				
Firing distance to target line (m)	≤ 25	50	75	100
Height (m)	1.0	1.5	1.5	2.5
Flank extension beyond target (m)	1.0	1.5	2.0	2.5
Backstop depth (at crest) no less than 0.5m Impact surface - No exposed hard objects within the CofF excluding the target Condition = No degradation or scooping				

Note: These measurements may be adjusted to meet the construction dimensions of existing indoor range structures, e.g. actual firing mound heights (refer to tables 3.4 and 3.6 for dimensions of indoor backstop materials). Centrefire pistol may be fired in an indoor rimfire NDA range.

Outdoor NDA range backstop dimensions for centrefire pistol /rifle
(For firing distances over 100 metres refer to section 4)

Pistol						
Firing distance to target line (m)	≤ 10	15	25	50	75	100
Height (m)	2.5	3.0	5.0	7.0	9	12
Flank extension beyond target (m)	1.0	1.0	1.5	2.0	2.5	3.0
Backstop depth (at crest) no less than 0.6m Impact surface - No exposed hard objects within the CofF excluding the target Condition = No degradation or scooping						

Rifle				
Firing distance to target line (m)	≤ 25	50	75	100
Height (m)	4.0	5.0	6.0	7.0
Flank extension beyond target (m)	1.0	1.5	2.0	2.5
Backstop depth (at crest) no less than 0.9 m Impact surface - No exposed hard objects within the CofF excluding the target Condition = No degradation or scooping				

Note 1: Flank extension is measured from the outermost flank target (to the left or right of the target line).

Note 2: Overall heights have been calculated allowing for primary firing positions of lying, kneeling and standing.

Note 3: Height is calculated from the furthrest firing line to the target line and the toe of the backstop being no further than 3.5 m from the target line.

Note 4: NDA Backstop height is based on the elimination of range floor strike forward of the target line. If range floor strike occurs the Shooting Range Operator is to consider additional control measures for ricochet capture, such as a canopy, construction of baffles, or a recalculation of the TCH and/or the height of the firing point/line in order to maintain a NDA range status.

Table 3.2 – No danger area backstop dimensions

Bullet catchers

3.15 Although optional, it is recommended that NDA ranges have a purpose-built bullet catcher, the bullet catcher is the area directly behind the furthest target line. The purpose of the bullet catcher is to capture the majority of correctly aimed shots fired at a target. A bullet catcher may be a standalone structure or part of a backstop. Bullet catcher may be used to:

a. Minimise degradation of the backstop (e.g. loss of slope angle).

b. Minimise backstop maintenance.

3.16 Where practicable, a bullet catcher is to be established parallel to the firing line(s) and furthest target line. However, a maximum deviation of 10 degrees from the range axis is permitted.

3.17 The bullet catcher may be constructed of a solid inert core material, however, the forward slope must be covered by suitable fill material (e.g. sand, soil, aggregate):

a. **Low velocity** - Fill material depth behind targets is to be no less than 500mm measured parallel from the horizontal or line of fire.

b. **High velocity** - Fill material depth behind targets is to be no less than 900mm measured parallel from the horizontal or line of fire.

3.18 The forward slope angle of the bullet catcher for high velocity ammunition is to be established at no less than 34 degrees. This angle may reduce over time with natural settlement of the fill material, projectile impact, tunnelling, and weathering. The slope must never be allowed to fall below 30 degrees, whereby it must be re-established back to 34 degrees (see figure 3.4).

3.19 If rubber chip is to be used as a fill material, it should be shredded rubber chip that has no steel belt fragments. The rubber chip should be of a regular shape and sized 10 - 35 mm in any direction allowing them to interlock. Rubber presents a potential fire hazard, however can be sprayed with a fire-retardant compound repeated projectile impact will wear down the rubber to a powder creating and it will need to be maintained.

3.20 Plastic drums (or other fit for purpose structures) may be used as a fixed or permanent bullet catcher where they can be positioned and/or constructed to achieve the requirements of a bullet catcher.

3.21 The bullet catcher should be no less than 2.5-metres in height or must extend above the maximum target height by no less than 0.5 metres, whichever is the greater for the total width of the target line.

3.22 Maintenance of the bullet catcher is an important aspect for the safe operation of a range (where applicable). Regular checking and refurbishment of the bullet catcher is to be included in the range maintenance schedule (refer to table 3.3).

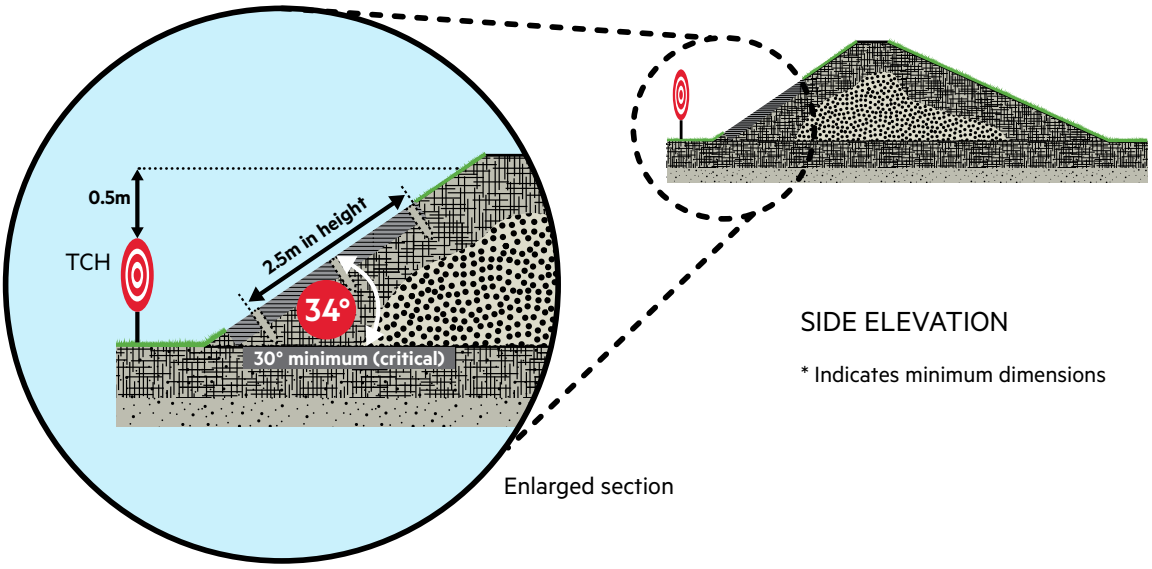


Figure 3.4: Bullet catcher construction dimensions

Examples bullet catcher maximum muzzle velocity (MV) or Muzzle energy (ME) - Established range

Indoor ranges	(m/s) MV	Joules ME
Rimfire pistol or rifle	530	285
Centrefire pistol	520	645
Centrefire rifle (NDA)	1000	4500

Outdoor ranges	(m/s) MV	Joules ME
Rimfire pistol or rifle	610	480
Centrefire pistol	655 (2148fps)	2030
Centrefire rifle (NDA/RDA)	1000	7000
No requirement for limitation during field shooting (No bullet catcher)		

Note: 1. To maintain a bullet catcher in a serviceable state, range standing orders should detail the maximum permissible firearm muzzle velocity or energy to be used on the range.

Table 3.3 – Examples of bullet catcher maximum muzzle velocity or muzzle energy


Backstop
Target Line and Target Holders
Range Floor

Mobile bullet catchers

3.23 The SRO is to approve the use of mobile bullet catchers on the range and is to ensure that the bullet catcher will capture all ammunition used. The officer on duty is to check that the mobile bullet catcher is fit for purpose prior to use. For targets that are positioned on the range floor at locations other than at the bullet catcher/backstop/side backstop, they should be large enough to capture the cone of fire for the distance being fired. The most common mobile bullet catcher currently in use is a 200 litre (blue) plastic drum filled with suitable material. Other appropriate forms of mobile bullet catcher may be used.

3.24 For plastic drums, recommended modifications are:

a. Prepare the drum to allow ease of filling

b. Filled with appropriate material that will capture ammunition. Examples are:

(1) **Conveyor belt** – the belt material must be at least three layers thick around the complete circumference of the drum. Depending on the width of the conveyor belt it may need to be stacked two layers high inside the drum.

(2) When using other types of fill material such as rubber chip, sawdust, sand or soil, the drums must be filled to the top and regularly maintained.

c. Soft targets must be placed on the lower half of the drum.

d. Steel targets must be placed directly in front of the drum.

Side berms, side backstops and side walls

3.25 The use of side berms and/or side walls are not mandatory where there is no risk to the operation of adjacent ranges, or the range danger area is contained within the approved boundary of the range. However, on ranges which do have side berms and/or sidewalls they may have been constructed for one or a combination of the following reasons:

a. To prevent movement of people or animals onto the active range area.

b. To reduce the likelihood of an errant shot, ricochet, backsplash or splatter escaping the active range area.

c. To separate adjacent ranges and protect people in areas adjacent to the range.

d. To protect buildings or equipment (e.g. a target shed).

Side berms

3.26 If side berms are used, they are for down range shooting only and they should.

a. Be a compliant height measured from the range floor.

b. Have a slope no less than an angle of 34 degrees.

c. Have a crest depth of no less than 600 mm.

d. Meet the following:

1) connect with the backstop where practicable

2). be continuous without gaps unless:

a) the gap has a structure that does not compromise the purpose of the side berm, e.g. access gate or target shed,

b) the gap does not constitute a ballistic risk

c) the gap is mitigated in RSOs.

3.27 Tyres may be used in the construction of side berms or as a method to increase their height. If tyres are used for these purposes, they should be:

a. Stacked staggered and overlapped to provide uniform, gap-free coverage.

b. Cut away on one side and filled with soil or sand that is firmly compacted (though fill material may not be required if the tyres can be stabilized, e.g. with conveyor belt material secured to the tyres.

c. Tyres used for the purpose of increasing the height of a side berm may not require filling if securely

supported and configured to prevent toppling, sagging, or leaning.

Side backstops

3.28 If any section of a side berm or the complete length of a side berm is to be shot into (direct impact), then the side berm must meet the construction requirements of a backstop and therefore is to be known as a side backstop (refer to para 3.7). The height must be increased to be no less than 2.5 metres high as measured from the range floor which is the minimum no danger area backstop height at a firing distance of no more than 10m.

Side walls

3.29 A side wall can only be used as a side backstop when an approved mobile bullet catcher is used and positioned correctly to capture all direct impact or ricochet.

3.30 A side wall must be vertical and be no less than 2.1 metres high measured from the range floor. They should be constructed of materials as set out in table 3.5. They should meet the following:

1) connect with the backstop where practicable

2) be continuous without gaps unless:

   a) the gap has a structure that does not compromise the purpose of the side wall, e.g. access gate or target shed,

   b) the gap does not constitute a ballistic risk

   c) the gap is mitigated in RSOs.

Range floor

3.31 The range floor is defined as the space between the furthest firing point or line and the most distant target point or line. Where practicable, it should be reasonably level, firm, free- draining to prevent ponding and have a covering of topsoil free of any material such as rocks that might cause a ricochet. Grass is the most common top cover, however, there are other acceptable materials. Particular attention is needed to cover or remove any exposed hard surfaces within the cone of fire. The range floor should not contain any standing bodies of water (e.g. lake, river or stream) that projectiles could be fired into, unless a berm or ground baffle is in place to prevent impact. Field shooting range floors are natural features that must allow clear line of fire to the target.

Baffles and protective cladding

3.32 Baffles are constructed and positioned to contain projectiles from escaping the active range area. The projectiles may be direct impact or ricochets. If baffles are constructed of hard material such as steel, protective cladding must be attached to baffle surfaces or other hard sufaces that are expected to receive direct impact or ricochet to reduce backsplash. Protective cladding should be checked for serviceability and hidden attrition (unseen degradation of the base material covered by the cladding) as part of the range maintenance schedule. Baffles can be constructed on the ground, on side walls and overhead.

Baffles

3.33 It is recommended that the SRO seeks advice from Clubs and Ranges for the siting of all types of baffles. For the construction materials and dimensions, refer to tables 3.4 and 3.6.

Cladding

3.34 Material used for cladding should allow penetration of the projectile to the baffle and contain all resultant backsplash. The cladding material must be offset from the hard surface to allow the bullet to break up on the hard surface without causing excessive damage to the cladding. Refer to table 3.7.

Minimum thickness (mm) of construction materials considered impenetrable to direct bullet strike for indoor and outdoor ranges				
Ammunition	**Concrete (40 MPI)**	**Timber casing**	**Concrete Block**	**Timber**
0.22LR Rimfire	75	100	100	125h/w or 150 s/w
Centrefire pistol	150	50 timber either side with a 100 fill	215	175h/w or 200 s/w
Centrefire rifle	200	50 timber either side with a 150 fill	230	250h/w or 375 s/w

Note: 1. A combination of materials or newly developed fabrics of various dimensions may be used subject to review and approval by Clubs and Ranges.
Note: 2. Hard Wood (h/w) and Soft Wood (s/w).

Table 3.4: Minimum thickness of construction materials

Minimum thickness (mm) of construction materials for sidewalls on outdoor ranges (see note 1)				
Ammunition	**Concrete (40 MPI)**	**Timber casing**	**Concrete Block**	**Timber (see note 2)**
0.22LR Rimfire	N/A	N/A	50	50 s/w
Centrefire pistol	75	50 timbers either side with a 75 fill	100	150 s/w
Centrefire rifle	100	50 timbers either side with a 100 fill	230	250h/w or 375 s/w

Note: 1. A combination of materials or newly developed fabrics of various dimensions may be used subject to review and approval by Clubs and Ranges.
Note: 2. Hard Wood (h/w) and Soft Wood (s/w).

Table 3.5: Minimum thickness of construction materials for sidewalls on outdoor ranges (see note 1).

Protective steel plating (mm) for indoor/outdoor ranges		
Ammunition	**Defence zone/Baffles**	**Bullet catcher - Impact**
0.22LR Rimfire	5 direct - 3 flank	6 mild - 4 armoured
Centrefire pistol	6 direct - 5 flank	8 mild - 6 armoured
Centrefire rifle	12 - 8 armoured (see note 1)	See note 2

Note: 1. Minimum recommended abrasive resistant (AR) steel grade with a Brinell hardness (BHN) for centrefire rifle is AR500 (or equivalent).
Note: 2. It is recommended that design advice specific to the range is obtained from Clubs and Ranges.

Table 3.6: Steel protective plating for ranges

Minimum thickness (mm) of construction materials for cladding On all ranges exposed hard surfaces must be protected from direct fire to prevent backsplash and ricochet. Traditionally sacrificial timber is added to the face of hard surfaces and steel baffles to prevent backsplash and excessive ricochet, but other materials may be just as suitable (see note 1).			
Ammunition	**Sacrificial Timber (soft wood)**	**Conveyor Belt**	**Battens – Offset Spacing (see notes 2 and 3)**
0.22LR Rimfire	25	8	25
Centrefire pistol	50	12.5	50 s/w
Centrefire rifle	50	12.5	50

Note: 1. A combination of materials or newly developed fabrics of various dimensions may be used subject to review and approval by Clubs and Ranges. Cladding is not required on a hard surface that is not within the cone of fire for down range shooting.
Note: 2. Battens are only used for direct impact surfaces or baffles, they are fixed to the hard and the cladding material is fixed to the batten.
Note: 3. The material used must prevent the bullet back-splashing or ricocheting back out from the protection. To reduce attrition, the protection material is offset from the hard surface by the use of battens to allow the bullet to break up on the hard surface without causing excessive damage to the protection material.

Table 3.7: Minimum thickness of construction materials for cladding

Firing points and firing lines

3.35 Firing points and lines are designed locations on the range floor established at specific distances where firing takes place. They are designed to provide the shooter with a level platform (sometimes elevated) with a clear view and unobstructed line of fire to their respective target(s) or target lines.

3.36 Firing points and lines should be established at right angles to the range axis (direction of fire) and where possible parallel to the target line (if applicable).

3.37 Firing points and lines should be marked with the designated firing distance to ensure all range users can clearly identify the correct location of the firing point and/or line.

3.38 Some firing points or lines may have an adjustable shutter or 'eyebrow' positioned on the firing point to limit the shooters line of sight above the top of the backstop and/or to prevent the barrel of the firearm from being raised to an unsafe angle. The purpose of these structures is to provide shooters with additional measures to ensure they maintain the approved cone of fire.

Spacing between shooters

3.39 Firer position spacing is measured centre-to-centre between adjacent firer positions. The spacing of firer positions along the firing line should be large enough that:

a. Shooters do not cause unnecessary distraction to each other during firing e.g. being hit by ejected cases.

b. The officer on duty can conduct their duties e.g. maintain control of the range.

Firing line height

3.40 Where practicable and depending on the range design and its intended use, firing points and firing lines can be elevated above the range floor. This elevation improves visibility of the target area. and should be constructed to provide for the safe movement of shooters.

3.41 Elevating the firing point or firing line may also have the effect of removing the range floor from the cone of fire (a similar effect to sloping the floor toward the target area). If multiple elevated firing points and firing lines are provided on a range, range design must ensure that firing points positioned in front of other firing points and firing lines do not interfere with any shooter's line of sight or create an unacceptable ricochet hazard.

Firing line depth

3.42 Firing line depth is the distance measured from the front edge of the firing line to the rear edge of the firing line. Each firing line must be deep enough to accommodate the shooters and their equipment and provide space for the officer on duty (or any other designated range safety person) to function behind them without any obstructions. The recommended firing depth is a minimum of 2.5 metres.

Covered firing line

3.43 The firing line may be covered with a weather shelter. The height and construction must not interfere with the shooters or the officer on duty during any part of their activities on the firing line e.g. preparation, firing, supervision. The firing point cover must not obscure the view of the active range area from the shooters or the officer on duty.

Targets

3.44 Targets can be constructed of various penetrable materials such as paper, cardboard, core-flute and thin plywood. Non-penetrable or steel targets are covered in paragraph 3.60. Correct target positioning is critical to ensure projectiles are contained within the range danger area. Targets should be presented facing directly towards the firing point/line and/or shooter. Targets can be presented using various types of target support mechanisms, however, any support mechanism constructed of ricochet inducing material should be clad with sacrificial material on all forward-facing surfaces.

Target centre height

3.45 Targets should be set at a height that projectiles are captured by the centre of the bullet catcher or the main impact area of the backstop.

3.46 The target centre height depends on the physical structures of the range and should enable a near level line of fire although there are circumstances that may require either elevated or depressed lines of fire (uphill or downhill shooting). A depressed line of fire could be an advantage if ground permits where the target centre height can be measured based on the impact angle.

Target lines

3.47 A target line is the area where a single target or several targets are positioned. This area can be a marked line on the range floor or have target support mechanisms such as in ground sockets to support target placement. The target line should be located as close to the toe of the bullet catcher or backstop as possible.

3.48 Intermediate target lines may be established between the furthest static firing line and the main target line. The target centre height must be adjusted to ensure that aimed shots at respective target lines will remain within the range design cone of fire and be captured by the bullet catcher and/or backstop.

3.49 A target line should always be established at a right angle to the range axis (down range direction of fire) and where possible parallel to the backstop and/or bullet catcher if applicable. The target frames and support mechanisms made of ricochet inducing materials exposed to direct impact are to be clad with sacrificial timber or lined with material that will reduce the potential for ricochet. Tyres used in the construction of target lines or to support target presentation, are also to be clad with sacrificial timber or lined with another suitable material, or alternatively dug in where possible.

Moving targets

3.50 Moving targets are those targets that move across the static target line of the range or are presented in a vertical plane to a height that does not compromise the purpose of the bullet catcher and/or backstop, e.g. running boar, vertical can and clay bird target launchers. This does not include purpose-built clay bird target traps or reactive static steel targets, e.g. poppers, drop turners, swinging targets.

3.51 For ranges where moving targets are used, the design of the range and application of the ammunition danger area template must be considered, and the maximum left and right limits of the target run (traverse) must be clearly marked or indicated on the target line so that shooters can identify the approved arc of fire where the moving target can be engaged.

Steel targets

3.52 For shooting activities where steel targets are used, the provisions of the most current version of the Pistol New Zealand Steel Target Safe Use Guide is to be used.

3.53 There are two types of steel targets generally used for target shooting:

a. **Reactive** – these targets can react by falling forward, spinning, swinging when struck, e.g. poppers.

b. **Non-reactive (rigid)** – these targets are fixed at a forward leaning angle (the recommended angle is 15 degrees from the vertical), and do not move when struck, e.g. cowboy action targets, gongs. The purpose of the forward leaning angle is to direct backsplash, splatter and/or potential ricochet into the ground.

3.54 Steel targets should be positioned to be shot from directly in front only, and not positioned where projectiles may hit the target's back, sides, mechanism or supports. Targets should be positioned as close as practicable to the bullet catcher, backstop, side backstop, or mobile bullet catcher at the appropriate target centre height, to ensure any potential ricochet will be captured.

3.55 Steel targets must be free from any type of indentation or deformation that could cause unpredicted ricochet or backsplash. The surface of the plate should be flat and not have any welded elements protruding from the surface (facing) of the plate. If required for fixing, round-head coach bolts (high tensile) that are near flush to the surface (facing) can be used so that splatter and/or ricochet are captured by the plate. All attachment points must be on the rear of the target or hidden behind support/screening materials. Any welding used in the construction of the target must not affect the Brinell hardness of the material through excess heating. Any supporting structures for the target (e.g. a hanging steel plate) where possible should be positioned outside of the cone of fire or be shaped to direct ricochet into the bullet catcher, backstop, side backstop, or mobile bullet catcher. If this is not possible, then any exposed target support material is to be clad with sacrificial timber or other suitable material.

3.56 Although steel targets present a hard impact surface, a ground impact surface ammunition danger area template may be applied when:

a. targets are targets are positioned correctly, erected and/or supported at a forward leaning angle (from the vertical) facing square on (at right angles) to the firing point.

b. the impact surface behind the target within the cone of fire does not present a hard target surface

c. the target is located a close as possible to bullet catcher or backstop.

3.57 Where any doubt exists, a hard target ammunition danger area template is to be applied.

3.58 Grades and thickness of steel targets may be calculated based on the projectile velocity, impact energy, firearm and ammunition used for the specific shooting activity to be conducted. Abrasive resistant (AR) steel with a Brinell hardness (BHN) of no less than 450 is suitable for most uses, however, AR500 is the recommended standard.

3.59 Range standing orders may include any additional measures deemed necessary by the shooting range operator to control the safe engagement of steel targets

if used on a range, including designating minimum safe engagement distances.

3.60 Steel plate racks may have an adjustable steel baffle angled to deflect direct impact, splatter, and any potential ricochet towards the ground in front of the rack. There is no requirement to clad this baffle, however, any other support structures may require cladding if located within the cone of fire.

Steel target shrouds

3.61 Steel target shrouds may be used on ranges where steel targets are used to capture potential backsplash and splatter. The provisions for the use of steel target shrouds are contained in the Pistol New Zealand Steel Target Safe Use Guide for Pistol New Zealand shooting activities. Shrouds can be constructed from any non-ricochet inducing material that is strong enough to contain potential backsplash and/or splatter. Shrouds are to cover an angle of 20 degrees front to rear of the steel target. Range standing orders may include additional control measures required for the safe engagement of steel targets.

Canopy

3.62 A canopy may be installed to:

a. **Capture pop-over** - the occasional high-angle ricochet caused by deformed projectiles exiting an earth or sand bullet catcher.
b. **Contain splatter** - from targets, especially steel ones, to prevent bullet catcher fill material and projectile fragments from leaving the range.
c. **Protect** - the bullet catcher and target line from adverse weather conditions.

Regardless of its purpose, the canopy must span the full width and depth of the bullet catcher. If the canopy is intended to capture pop-over, it must be built to a ballistic standard using materials that are impenetrable to ricochet. For timber-framed canopies, the underside must be lined with mild steel at least 3 mm thick. This steel lining must cover at least the rear half of the canopy underside (in depth), directly above the earth or sand fill, and extend across the entire width of the canopy. The sides of the canopy must also be ricochet-resistant, and may be constructed from materials such as brick, block, mild steel, timber, or concrete (which also offers weather resistance and low maintenance). The rear half of the canopy underside is the most likely area to receive vertical ricochets. Where applicable, the leading face of the canopy and its supporting posts must be clad with sacrificial timber to mitigate backsplash.

Environmental planning considerations

3.63 When establishing a new shooting range, the shooting range operator must consult with territorial authorities and regional councils about potential environmental issues such as excessive noise levels, contaminated waste management (which may involve removal), or contamination of watercourses. Existing ranges may already be operating under existing consents and may or may not need additional territorial authority or regional council approvals. During the application process, range operators or applicants will be required to declare that all necessary territorial authority and regional council consents to operate the pistol shooting range, or non-pistol shooting range, have been obtained.

3.64 Environmental issues may include:

a. **Lead contamination** - into the ground, ground water, waterways, buildings, and surrounding areas,
b. **Extraction of airborne contaminants (indoor ranges)** – the ventilation system should be filtered before the airflow expels into the external environment,
c. **Noise containment and suppression** - potentially excessive internal and external noise levels, and
d. **Potential risk of fire** - due to excessive build-up of unburnt powder e.g. initiated by muzzle flash.

3.65 Health issues associated with indoor and outdoor shooting ranges may include:

a. Lead exposure,
b. Potential harm from airborne contaminants produced during firing,
c. Potential damage to hearing, and
d. Potential damage to eyesight.

Landowner consent

3.66 Landowners whose property is used for the operation of a shooting range and its associated danger area must consent to the use of their land as a shooting range. It is recommended that consent is recorded in writing.

Air danger height and airspace considerations

3.67 Air danger height is the maximum height above ground level in which a hazard to aircraft may exist. The air danger height is either the highest point of an aimed shot measured from a firing position, or the maximum ricochet height of the ammunition fired.

3.68 Air danger height has two applications in the design and operation of a shooting range, and must be considered for:

a. **Civil aviation authority** – The range operator must notify the Civil Aviation Authority in advance if the trajectory of a projectile is likely to exceed:

(1) 45 metres (150 feet) above ground level within 4 km of an aerodrome boundary, or

(2) 120 metres (400 feet) above ground level if more than 4 km from an aerodrome boundary.

b. **Ammunition ricochet danger height**: Ammunition projectiles may travel in a vertical dimension from potential ricochets to a height above ground level in which a hazard to aircraft may exist. The potential for ammunition ricochet is considered in the design, construction and operation of shooting ranges, e.g, the use of baffles. The potential for ammunition ricochet danger height must be considered for reduced danger area and full danger area ranges, however, it is not a requirement for no danger area ranges.

3.69 Where a shooting range is located within 4 km of an aerodrome, it is a legal requirement for the shooting range operator to liaise with local aerodrome operators to identify any procedures required for the safe operation of both facilities. This may require a formal agreement to be established between the shooting range operator and the aerodrome management.

Airspace intrusion

3.70 Although there have been dimensions stated above for air danger heights, it is difficult to accurately judge the height of low flying aircraft within the air danger height of a shooting range, without specialist equipment. Therefore, any airspace intrusion is to be controlled safely by the officer on duty stopping all shooting for the duration of the intrusion. This is to be clearly stated in range standing orders.

Indoor non-pistol shooting range design and construction

3.71 Indoor non-pistol ranges have specific criteria for the safe design and construction of these ranges. It is recommended that SRO seeks advice from Clubs and Ranges.

Clay target (shotgun) shooting range design and construction

3.72 Clay target shooting ranges have various criteria for the safe design and construction of shotgun shooting ranges, depending on the specific clay target shooting activity. It is recommended that SRO seeks advice from Clubs and Ranges.

Measuring a shooting range

3.73 A video explaining how to measure specific components and structural features of a shooting range is available on the Clubs and Ranges webpage of Te Tari Pūreke – Firearms Safety Authority website (see figure 3.5).

Figure 3.5 – Video explaining how to measure components of a shooting range

Section 4

Section 4
Shooting range danger areas, signage and flags

Shooting range danger area definition

4.1 The shooting range danger area is the space where there may be a potential risk of injury to people or damage to property from a correctly aimed shot fired from a firearm on a shooting range.

4.2 A shooting range danger area is not designed to cater for a shot deliberately or accidentally fired in breach of range discipline or range standing orders.

The shooting range danger area is the space where there may be a potential risk of injury to people or damage to property from a correctly aimed shot fired from a firearm on a shooting range.

Shooting range danger area

4.3 This section contains dimensions and examples of ammunition danger area templates. The range danger area design is dependant on the ballistic characteristics of the type of firearm and ammunition to be used, range construction (site and design), the shooting activities approved for use, and the range design cone of fire. It also depends on the safe management of these shooting activities by the officer on duty and compliance with range standing orders. The dimensions and shape of the range danger area(s) are produced by the application of an ammunition danger area template.

Types of shooting range danger areas

4.4 There are three types of range danger areas that may be applied to a shooting range (see figure 4.1):

a. a no danger area (NDA) range,
b. a full danger area (FDA) range, and
c. a reduced danger area (RDA) range.

No danger area range

4.5 A no danger area range is where the range is designed to capture all projectiles and any ricochet, backsplash or splatter within the active range area. Factors that must be considered in order to establish a no danger area range include:

a. Minimum acceptable dimensions of the backstop including the correct slope angle,
b. Maximum firing distance,
c. Type of firearm and calibre,
d. Cone of fire to be applied,
e. Type of shooting activity,
f. Type of target to be engaged,
g. Type of shooting position to be adopted, and
h. Where high-velocity ammunition is used, a canopy should be considered.
i. An air danger height is not required for a no danger area range, however, it is considered good practice to stop firing whilst an aircraft is flying over the range danger area.

The range danger area design is dependant on the ballistic characteristics of the type of firearm and ammunition to be used, range construction (site and design), the shooting activities approved for use, and the range design cone of fire.

Shooting Range Danger Area Decision Flowchart

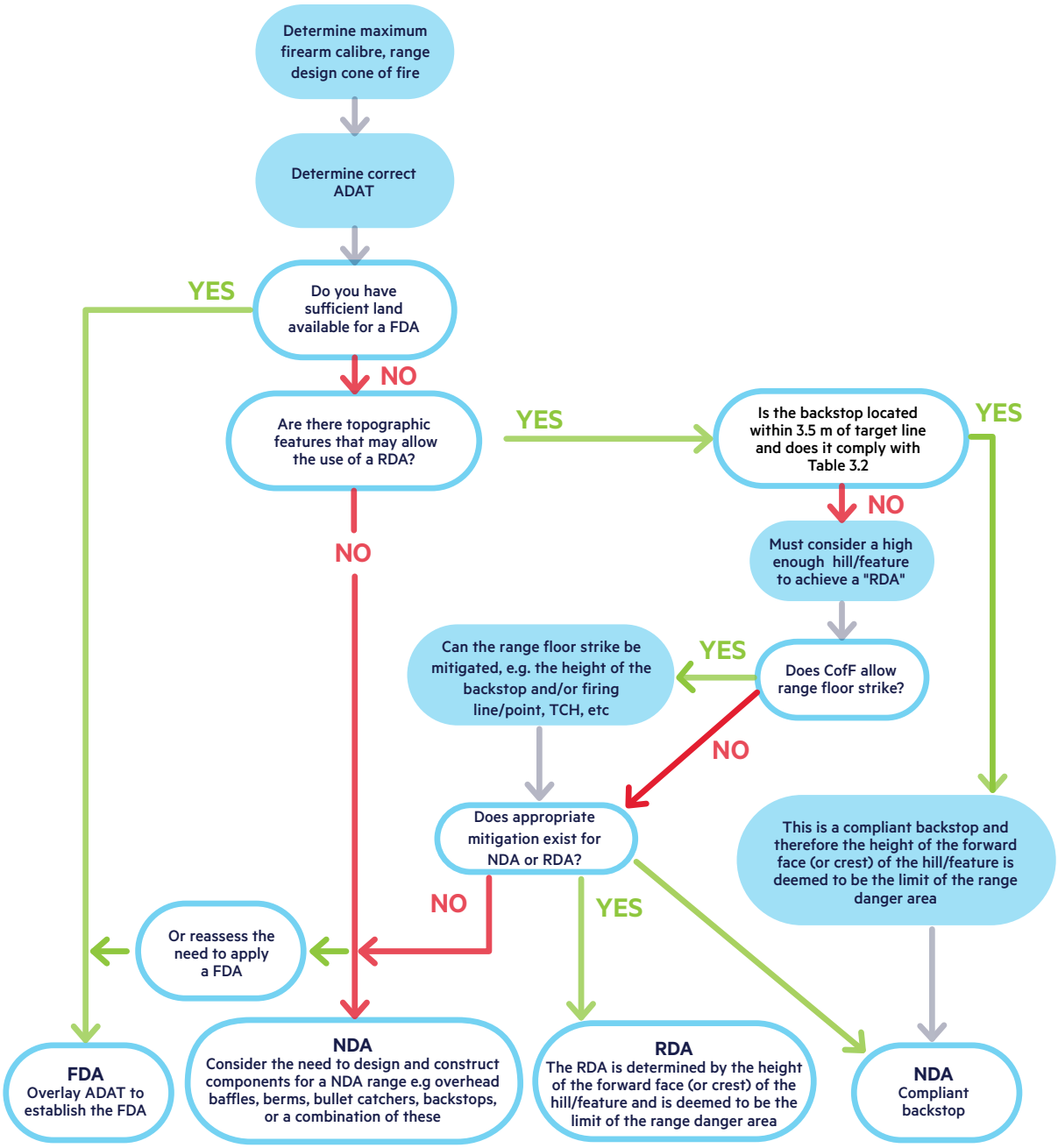


Figure 4.1 – Shooting range danger area decision flowchart

4.6 If projectiles land in any place outside of the range danger area the shooting range operator must immediately cease shooting activities on the range and investigate the cause. If any potential deficiencies in range design or construction are identified, the shooting range operator must engage a shooting range inspector for advice. The shooting range operator must remedy any faults identified by the shooting range inspector.

Full danger area range

4.7 A full danger area range is an outdoor range where the maximum distance of the danger area is limited only by the angle of departure of the firearm, the skill of the shooter and use of the correct ammunition danger area template (refer to table 4.2).

Range design cone of fire is not captured by an artificial structure or topographic feature

4.8 On outdoor shooting ranges where the range design cone of fire is not captured by an artificial structure or topographic feature, then a full danger area range must be established. However, where there is not sufficient land available to establish a full danger area range it may be possible to apply the reduced danger area criteria described in paragraph 4.9 of this section.

Reduced danger area range

4.9 A reduced danger area may be applied by using a significant topographic feature which is high enough to capture all predicted projectile impact and ricochets. When the respective ammunition danger area template is applied, identify a suitable contour line within the left and right of arc, to establish the reduced danger area cut-off. The designated cut-off must be contained completely within the approved land boundary for the total width of the template, (see figures 4.2, 4.3 and 4.4). The following criteria (or combination of) must be considered to establish a reduced danger area range:

a. Range tables for the approved ammunition to be used on the range. Range tables contain ballistic data specific to an ammunition type.

b. The ADAT for the largest calibre to be used on the range.

c. Targets - to include location, elevation (altitude), type (construction) and the approved target centre height.

d. Firing line(s)/point(s) - to include location, elevation (altitude) and the approved firing postures.

e. The air danger height for the largest calibre of ammunition to be used.

f. Slope angles – The slope angle of the topographic feature determines the minimum height in elevation at which the reduced danger area cut-off can be applied:

   1) A slope angle of 56 degrees or greater is not expected to cause a ricochet and therefore the reduced danger area cut-off point or designated contour line must be a minimum height in elevation of 50m above the highest target location(s).

   2) A slope angle of 34 degrees up to 56 degrees may cause a potential ricochet and therefore the reduced danger area cut-off point, or designated contour line must be a minimum height of 100 metres above the highest target location. CofF around the highest target must be captured by the RDA backstop and therefore targets are not to be positioned on crestlines where overshoot could occur.

   3) Any variation to the above reduced danger area cut-off height criteria may be considered subject to review and approval by the Clubs and Ranges Team.

g. Energy loss – consideration for energy loss includes:

   1) A projectile ricochet can lose up to 70% of it's energy after first point of impact.

   2) High velocity calibres will transition to low velocity over a distance of approximately 700 metres or greater. When a high velocity projectile has transitioned to low velocity, the ricochet angle also reduces to the low velocity angle.

   3) The greater the angle of decent, the more likely that any ricochet angle will be significantly reduced or eliminated.

   4) Data for energy loss is to be provided by the SRO for review by Clubs and Ranges.

Pop-over

4.10 Pop-over is where there is a tendency for the occasional projectile to deform and ricochet at high angle out of an earth or sand bullet catcher. On ranges where pop-over is considered a risk, and a canopy does not exist, RSOs are to have a procedure for dealing with pop-over should it occur, e.g., the SRO is to stop the activity immediately until a safe solution is identified and implemented. If a solution cannot be identified, the shooting activity must be removed as an approved activity on the range.

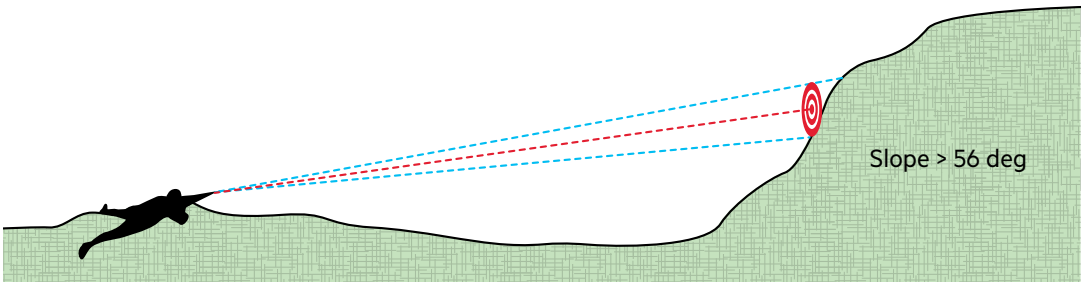


Figure 4.2: CofF captured by a topographic feature with a slope angle greater than 56 degrees

Figure 4.3: CofF captured by a topographic feature.

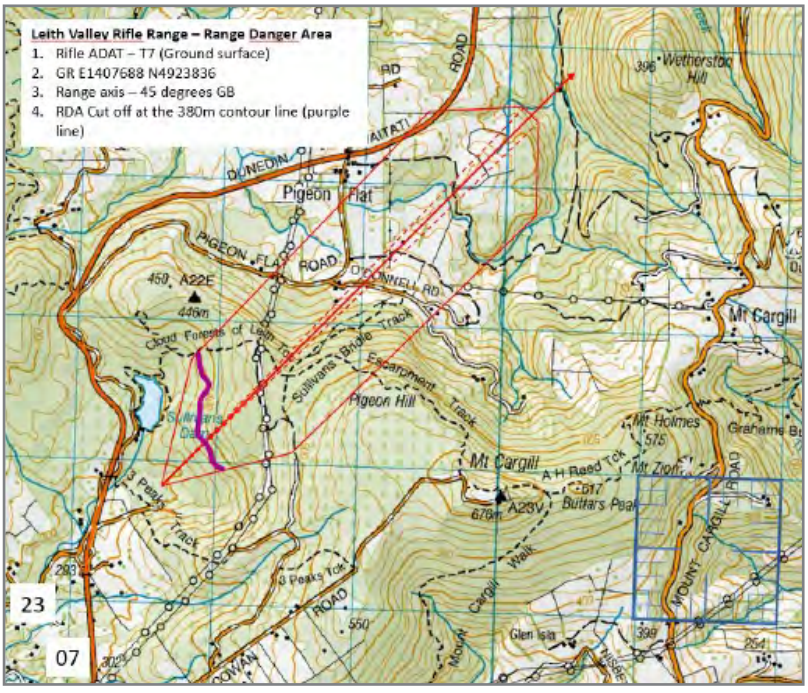


Figure 4.4: Electronic application of an ADAT to produce a scale diagram of the range danger area with the reduced danger area indicated by the red bold line using the Microsoft PowerPoint software application.

Effect of trees in shooting range danger areas

4.11 Heavy tree cover in a range danger area or on top of a backstop may be desirable for an outdoor range for aesthetics or noise reduction, however, trees do not mitigate a reducion in the dimensions of a range danger area or increase the height of a backstop.

Activity inside a shooting range danger area - managing the risk

4.12 The officer on duty must stop all firing immediately if unauthorised people enter the shooting range danger area.

4.13 The range perimeter danger signs serve to attract the attention of people in the area, e.g. hunters, farm workers and contractors, who could unknowingly enter the range danger area.

Determining a shooting range danger area

4.14 The range danger area is determined by applying the correct ammunition danger area template (1:50,000 scale or 1:25,000 scale) from the firing point/line along the range axis (direction of fire) on a topographic map (1:50,000 scale or 1:25,000 scale) of the range location. The outline of the ammunition danger area template is traced onto the map. If hard impact surfaces at less than 30 degrees and are within the cone of fire, then the hard impact surface dimension is to be applied. This procedure will produce a range danger area for the relevant ammunition type, at a given cone of fire, with a restricted angle of departure (QE), over a single arc of fire. See table 4.1 for an overview of the steps required to determine a range danger area and figure 4.5 for a process flowchart.

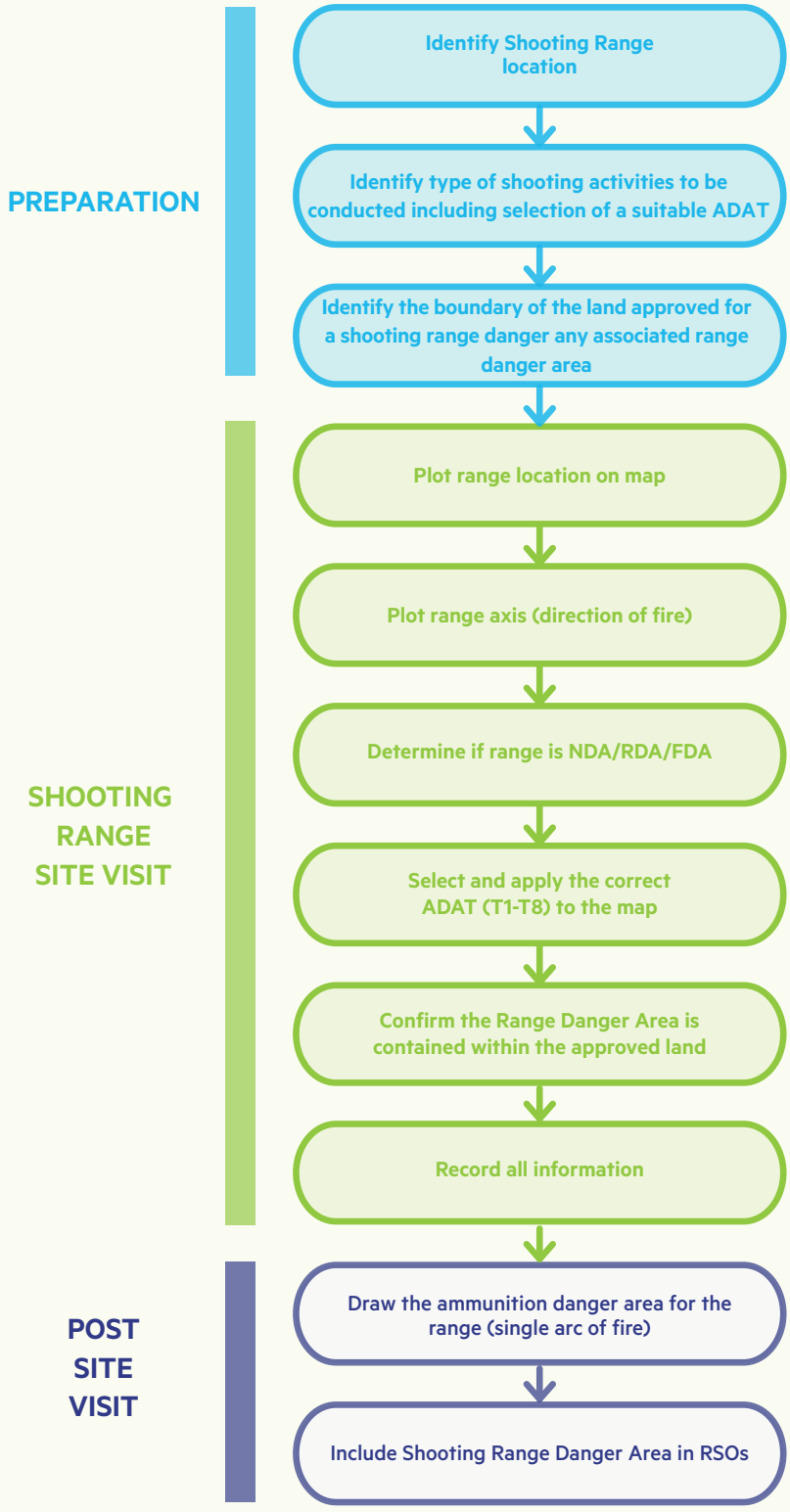
Impact surfaces

4.15 Impact surfaces are all surfaces within the range design cone of fire that are likely to be struck.. Impact surfaces are categorized as:

a. **Hard impact surfaces** which include concrete, rock, steel, water and frozen surfaces.

b. **Ground impact surfaces** are surfaces other than hard impact surfaces. The composition and depth of the ground (including topsoil, sand and vegetation) in some regions may allow for the ricochet angle to be reduced or eliminated if safe to do so by the shooting range operator.

Determining a shooting range danger area



Field shooting: A field shooting range may require an arc of fire or firing box with parallel bearings to maximum arcs for the respective shooting activity. This requires a more complex application of the ADAT.

Figure 4.5 - Process flowchart - determining a shooting range danger area

STEPS FOR DETERMINING A SHOOTING RANGE DANGER AREA		
STEP	**ACTION**	**DETAILS**
	PREPARATION	
1	Identify the range location	- Obtain a 1:50,000 or 1:25,000 scale Topographic Map of the overall range location
2	Identify type of shooting activity to be conducted on the range	- Obtain the correct ADAT required for the templating (the scale of the ADAT must match the scale of the map)
3	Identify the boundary of the land approved for use as a shooting range	- Plot the boundary on the map
	ONSITE	
4	Plot the individual range location on the map	- Walk the ground and familiarise yourself with the range layout and features - Move to the furthest firing point/line on the range, position yourself in the centre facing the direction of fire and plot your location on the map as a NZTM grid reference
5	Plot the range axis (direction of fire)	- Ensure that you are positioned at the same GR in Step 4 - Single Line of Fire: If using a Firing Point (FP), measure the range axis through the centre of the target line from the FP, this bearing should be at right angles to the target line (this will be a Magnetic Bearing (MB) if using a compass) - Convert the MB to a Grid Bearing (GB) and plot the centre of arc (range axis) on the map, take the appropriate ADAT for the ammunition to be used (use largest calibre) and the type of surface (ground or hard), place the ADAT on the FP and align with the centre of arc (range axis) - Visualise the range danger area to see if it fits within the land approved for the shooting activity - Arc of Fire: If using a Firing Line (FL), measure range axis from the centre of the FL to the centre of the target line (this will be a MB if using a compass) - Move to the furthest left firing position on the FL and measure the left of arc (to furthest left target), move to the furthest right firing position on the FL and measure the right of arc (to furthest left target) - Convert the MBs to GBs and plot them on the map, select the appropriate ADAT for the ammunition to be used (use largest calibre) and the type of surface (ground or hard), place the ADAT on the left end of the FL, align the spine of the ADAT with the left of arc and then move the ADAT to the right end of the FL, sweep the spine of the ADAT to the right of arc - Arc Markers: Fixed or temporary arc of fire markers can be used to establish a maximum left or right of arc instead of using the extreme flank targets. They can be an easily identified point on natural topographic feature (i.e. a spot height), or a man-made markers which can fixed or temporary - Visualise the range danger area to see if it fits within the land approved for the shooting activity
6	Select the correct ADAT – (from T1 to T8)	- Based on largest calibre to be fired - Approved CofF - Maximum angle of departure (QE) - Consider if a hard impact surface is to be engaged - Consider the ADH
7	Manually apply the selected ADAT to the map	- Place the ADAT FP on the map GR and align the centre spine of the ADAT with the direction of fire GB plotted on the map - If firing is to take place closer to the target line, the firing point on the ADAT is to be moved to the closest engagement distance and the range danger area re-assessed
8	Determine if the range is an FDA, RDA, NDA Range	- Identify any man-made or natural feature that could be used to safely reduce the danger area for the shooting activity - To achieve RDA or NDA status, the approved CofF of the ADAT must be contained by the selected man-made or natural feature - A NDA Range does not require a scale diagram of the range danger area, but does require a GB for the range axis (direction of fire)
9	Confirm range danger area	- Confirm that the range danger area is contained within the approved land boundary for the shooting activity
10	Record all information (onsite)	- Grid References to the maximum/minimum firing point/line - GB for the range axis (direction of fire) - Grid References to selected backstop/natural feature/limit of reduced danger area
	POST SITE VISIT	
11	Draw the scale diagram of the range danger area (single arc of fire)	- Draw the full ammunition danger area onto the map applying the correct ADAT - Check and confirm the accuracy of all GRs and the GB - Check and confirm the accuracy of the scale drawing - Annotate the scale drawing with the key information including but not limited to the firing point, axis, left and right of arc
12	Include in RSOs	- Prepare the scale drawing of the range danger area for inclusion in RSOs
Note	Field Shooting Range – Danger Area	- A field shooting range may require a firing box and an arc of fire for the respective shooting activity. This requires a more complex application of the ADAT. It may also require the application of a firing box using parallel arcs

Table 4.1 – Steps required to determine a shooting range danger area

Selection and application of an ammunition danger area template

4.16 The ammunition danger area template must be relevant to the types of firearms and ammunition to be used on the range and must reflect a thorough understanding of all types of shooting activities to be conducted on the range. This section includes guidance on the design, construction and application of a ammunition danger area template including examples of various templates. Scale diagrams of templates T1 to T8 (drawn to 1:50,000 scale) are available in figures 4.7 - 4.9 and can be obtained at Clubs and Ranges webpage of Te Tari Pūreke – Firearms Safety Authority Alternatively, the ammunition danger area template for a specific shooting discipline can be obtained on request to the relevant national shooting organisation.

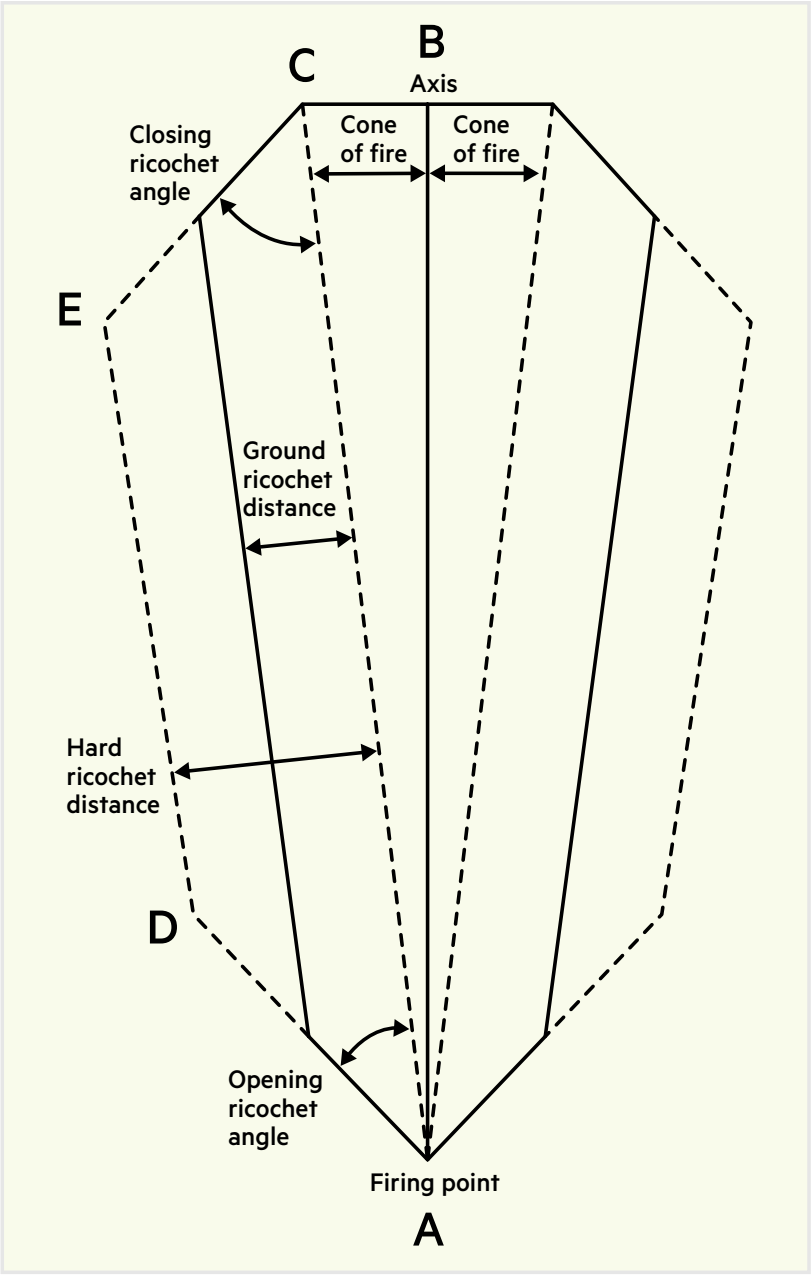
Ammunition danger area template design explanation (see figure 4.6)

1. **Line A – B.** Line A – B is a straight line between the firearm and the target, which has been extended to reach the maximum length of the ammunition danger area template. The maximum length of the ammunition danger area template is either:
   a. the maximum possible range of the projectile, or
   b. the maximum possible range of the projectile based on the angle of departure.
2. **Line A – C.** Line A – C is the cone of fire angle applied to Line A – B. Line A – C is the same length as Line A- B. The angle between Line A – B and Line A - C will vary depending on the cone of fire applied.
3. **Line A – D.** Line A – D is the opening ricochet angle and, unless empirical data exists to the contrary, it is always to be at an angle of 30 deg (530 mils) to Line A – C.
4. **Line C – E.** Line C – E is the closing ricochet angle and, unless empirical data exists to the contrary, it is always to be at an angle of 45 deg (800mils) to Line A – C.
5. **Line E – D.** Line E – D is the ricochet boundary. Ricochet distance between line A – C and E - D is recommended to be one eighth of the maximum distance for ground surfaces (see Note 3) or one quarter for hard surface (see Note 4).

Notes:

1. Completion of the Ammunition Danger Area Template. Lines A – C, B – C, A – D, C – E and D – E are mirrored to the right of Line A – B to complete the ammunition danger area template.
2. **Hard impact surfaces** which include concrete, rock, steel, water and frozen surfaces.
3. **Ground impact surfaces** are surfaces other than hard impact surfaces. The composition and depth of the ground (including topsoil, sand and vegetation) in some regions may allow for the ricochet angle to be reduced or eliminated if safe to do so by the shooting range operator.
4. Engagement of steel targets. When approved steel targets are used, the hard impact surface (dimensions) template may be replaced with application of the ground impact surface (dimensions) template. For this to be approved the following criteria must be met:
   a. The grade of the steel used for the target must be appropriate to withstand the impact of the maximum calibre of ammunition approved in RSOs. The grade of steel can range from AR450 for low velocity up to AR500 (or higher) for high velocity ammunition. For long range rifle shooting the grade of steel may be reduced to AR450 (or less) where the firing distance exceeds 700m. The grade of steel for airgun pellets is appropriate to withstand the direct impact of air pellets and strong enough to maintain an undamaged profile.
   b. Steel targets must be presented centrally in a near vertical or forward leaning angle (from the vertical) of at least 15 degrees (or at a suitable angle to direct projectile impact and splatter towards the ground) and be placed as close as possible to the toe of the bullet catcher or backstop at an appropriate target centre height to mitigate potential for range floor strike to occur.
   c. Steel targets must be positioned at a right angle (perpendicular) to the line of fire from each respective firing point.
   d. Steel targets must be regularly inspected for damage or pitting and refurbished or replaced as required.
   e. Pistol shooting (including rifles firing pistol calibres and shotguns firing 'lead shot') at steel targets does not create as greater risk as with high velocity ammunition. The Pistol New Zealand Steel Target Safe Use Guide for pistol shooting provides very comprehensive information for shooting at steel targets in all pistol shooting disciplines.
   f. An SRO is advised to seek advice from Clubs and Ranges or their association (if applicable) when planning to establish or upgrade an existing range that will need the application of an ammunition danger area template, for shooting at steel targets with high velocity ammunition.

NB: When shooting at steel targets the 'ground surface ammunition danger area template' is mitigated by the deliberate positioning and placement of steel targets to ensure any potential ricochet off the edge of the target will be captured by the bullet catcher and/or backstop. If there is any doubt, the 'hard surface ammunition danger area template' must be applied.



Note 1: Scale diagrams of all ammumition danger area templates can be found at Te Tari Pūreke – Firearms Safety Authority website. These diagrams can be printed to scale and photocopied onto an A4 transparent plastic film (also known as foils or transparencies).

Note 2: T1 to T8 ADATs are drawn with an angle of departure (quadrant elevation) of <150 mils. The cone of fire for rifle is 20 mils (1.125 deg) and for pistol is 23 mils (1.29 deg).

Figure 4.6 – Example of the components of an ammunition danger area template

Design dimensions of an ammunition danger area template

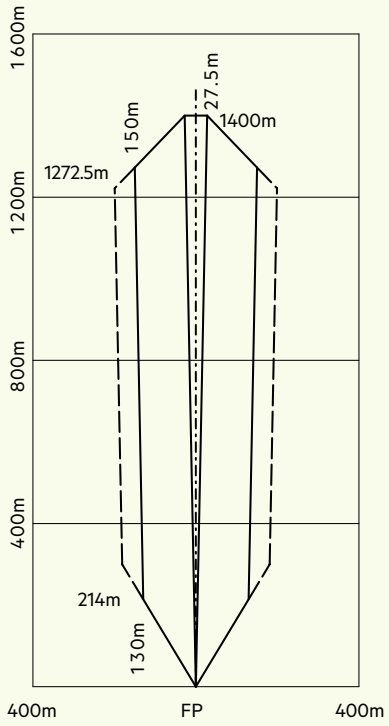
Ammunition danger area templates can either be produced by deterministic or probabilistic safety analysis methods recognised by Police. Table 4.2 shows deterministic ammunition danger area template dimensions by firearm type.

AMMUNITION DANGER AREA TEMPLATE (ADAT) DIMENSIONS								
Template	Suitable Firearms	Maximum Distance (m)	Opening Ricochet Angle (mils/deg) (See note 6)	Ricochet Distance (Ground) (m)	Ricochet Distance (Hard) (m)	Ricochet Closing Angle (mils/deg)	Air Danger Height (ft/m) AGL (See note 4)	Backsplash Safety Distance Ground / Hard (m) (See note 7)
T1	Rimfire rifle and pistols	1400	270 mils (15°)	175	350	800 mils/45°	500 ft/ 150 m	5 Ground 7 Hard (for T1/T2/T3)
T2	Centrefire Pistol up to .50 cal	2000	530 mils (15°)	250	500	800 mils/45°	500 ft/ 150 m	
T3	Muzzle loading and percussion rifles	2000	530 mils (15°)	250	500	800 mils/45°	500 ft/ 150 m	
T4	Centrefire Rifles up to .223 inch /5.56 mm (See Note 1)	2000	530 mils (30°)	250	500	800 mils/45°	500 ft/ 150 m	15 Ground 50 Hard (for T4/T5)
T5	Centrefire Rifles up to .223 inch /5.56 mm (See Note 2)	2500	530 mils (30°)	350	650	800 mils/45°	500 ft/ 150 m	
T6	Centrefire Rifles up to 8mm (.308 inch / 7.62 mm) (See Note 3)	2900	530 mils (30°)	400	800	800 mils/45°	500 ft/ 150 m	22 Ground 50 Hard
T7	Centrefire rifle .338 inch	3700	530 mils (30°)	450	900	800 mils/45°	500 ft/ 150 m	22 Ground 300 Hard
T8	Centrefire Rifle .50 inch	5200	530 mils (30°)	650	1300	800 mils/45°	3000 ft/ 1000m	120 Ground 350 Hard
Shotgun	(See Note 4)	200						
Blackpowder heavy armaments	Blackpowder cannons and mortars (See Note 5)							

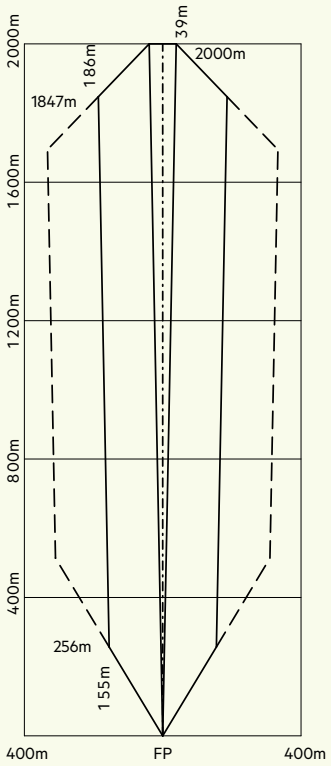
Notes:

1. T4 is to be used for firearms groups that fit within .223 inch/5.56 mm firing ammunition up to 55 grains.
2. T5 is to be used for firearms groups that fit within .223 inch/5.56 mm firing ammunition > 55 grains up to 69 grains.
3. T6 is to be used for firearms groups that fit within the .308 inch/7.62 mm (up to 8 mm) firing ammunition >69 grains. Other calibers can be used as long as they remain within the approved muzzle energy.
4. A shotgun ADAT is determined by the 'shot-spread' (created by the respective gauge and shot size) combined with the arc of fire (AofF) applied when engaging aerial (clay) targets on a set flight path within a permitted AofF. The arcs of fire may be designated by ground markers or the use of shooting stands/stalls/stations which limit the shooters left and right of arc.
5. Blackpowder cannons and mortars - There are no specific template dimensions for blackpowder cannons and mortars. The shooting range operator must be satisfied that firing of these firearms will not breach the approved range danger area. When calculating the danger area for blackpowder cannons or mortars, the following criteria must be considered:
   a. The direction of fire and maximum distance of the range danger area.
   b. The type and weight of the projectile.
   c. The amount of powder to be used.
   d. The angle of fire or elevation setting.
6. The opening ricochet angle may be applied from the target line where there is no likelihood of range floor strike between the firer and the target, i.e. firing across a gully. The opening ricochet angle can be reduced or eliminated where there is absolutely no likelihood of range floor strike or any range floor strike has been totally mitigated, i.e. use of ground baffles.
7. The backsplash safety distance is used to determine the minimum safe engagement distance for specific shooting activities, which may include the requirement to wear personal protective clothing and/or equipment. The minimum safe engagement distance will be clearly stated in range standing orders (if applicable).

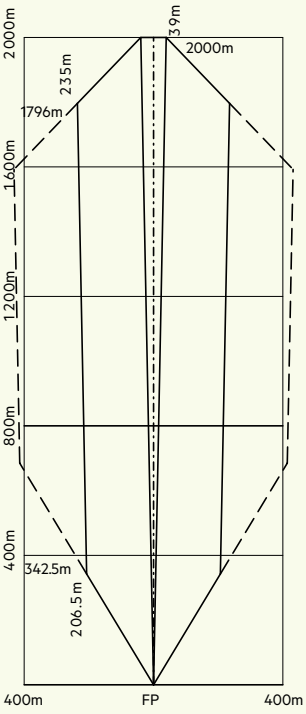
Table 4.2 – Ammunition danger area template dimensions



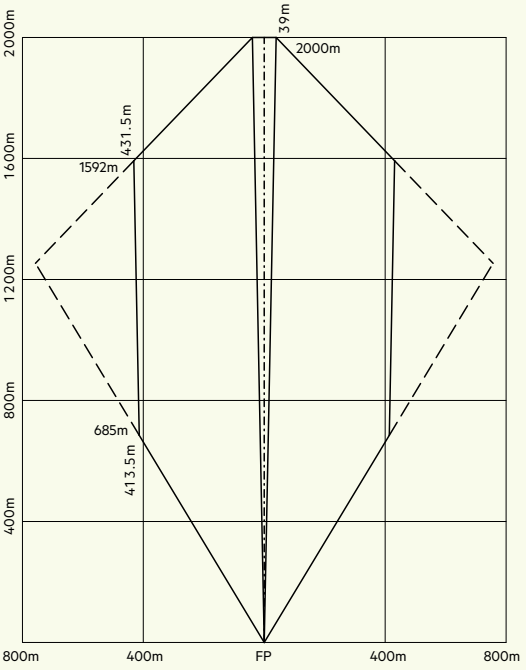
T1 - RIMFIRE RIFLE & PISTOLS



T2 - CENTREFIRE PISTOLS UP TO .50 CAL

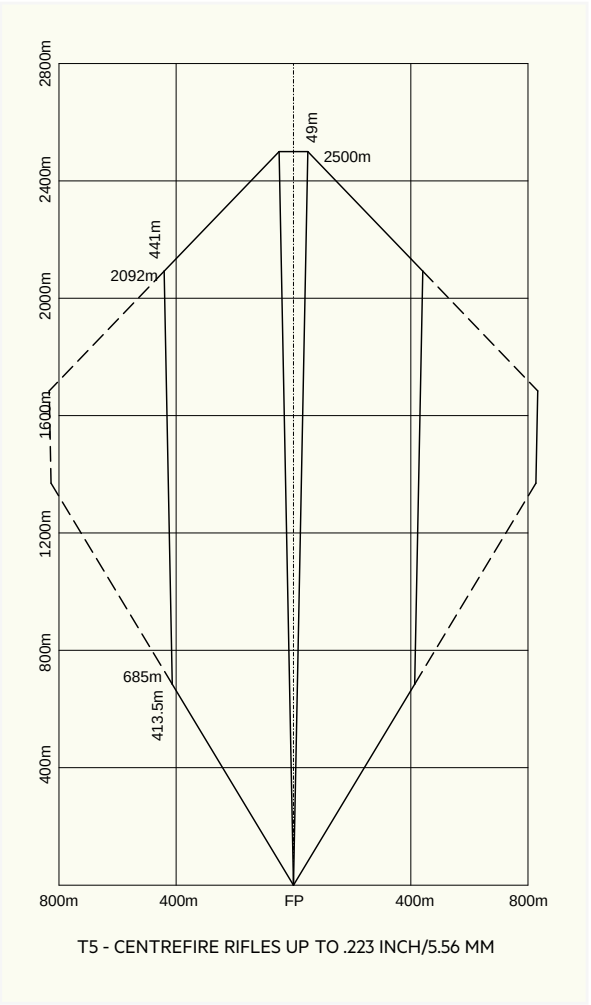


- MUZZLELOADING AND PERCUSSION RIFLE

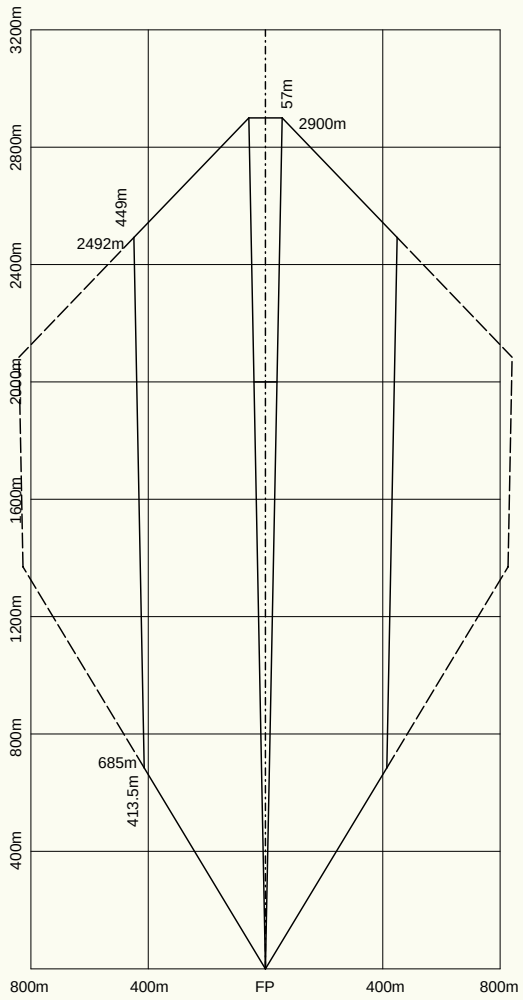


T4 - CENTREFIRE RIFLES UP TO .223 INCH/5.56 MM

Figure 4.7 - 1:25,000 T1 - T2 - T3 -T4 Templates (Not to scale)

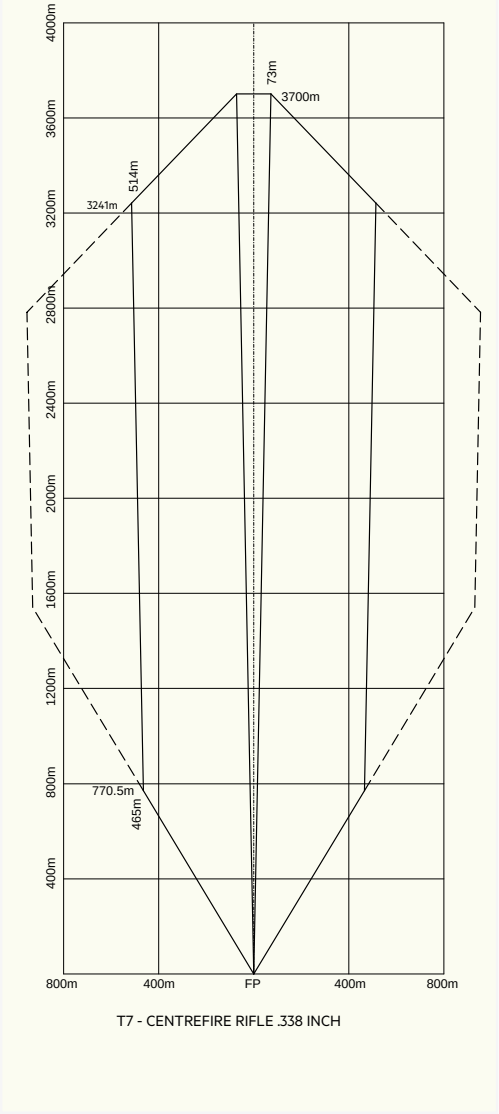


T5 - CENTREFIRE RIFLES UP TO .223 INCH/5.56 MM



T6 - CENTREFIRE RIFLES .308 INCH/7.62 MM UP TO 8 MM

Figure 4.8 - 1:25,000 T5 - T6 Templates (Not to scale)



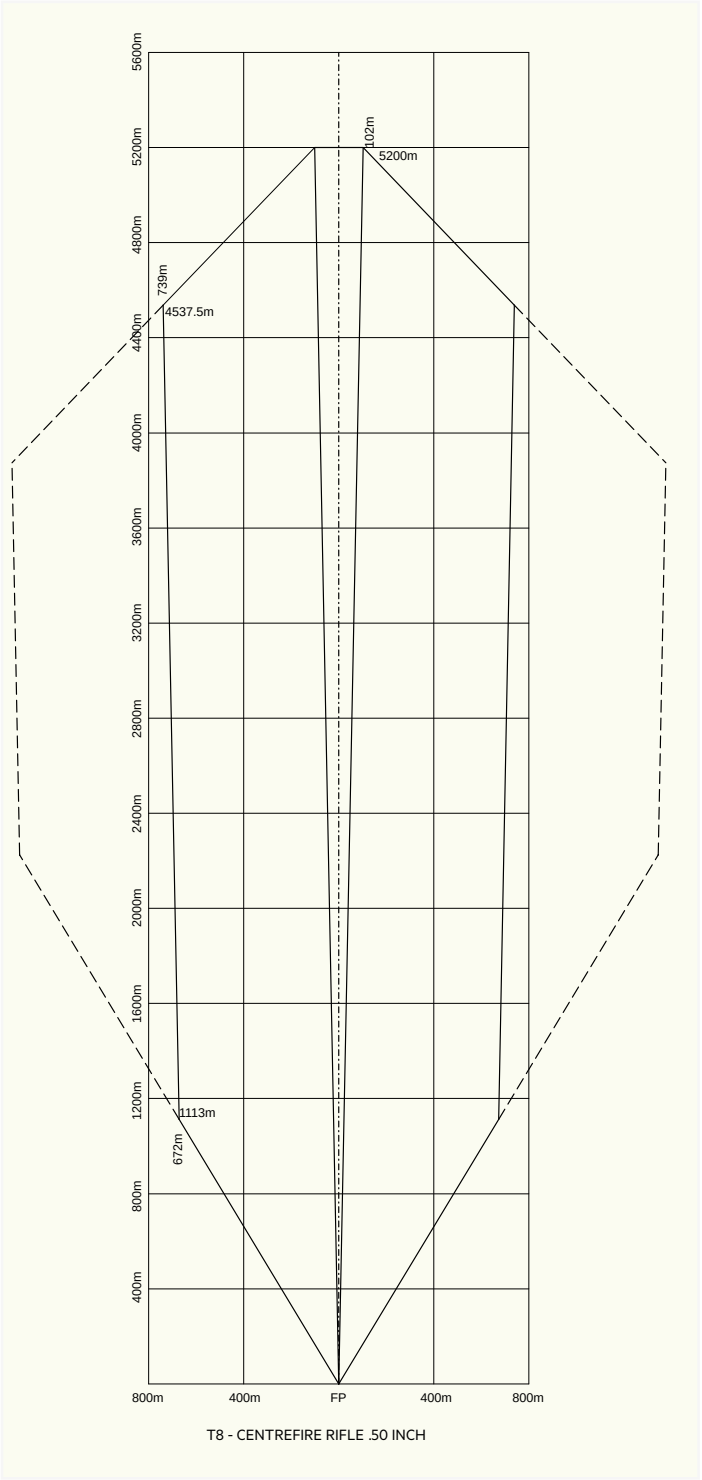
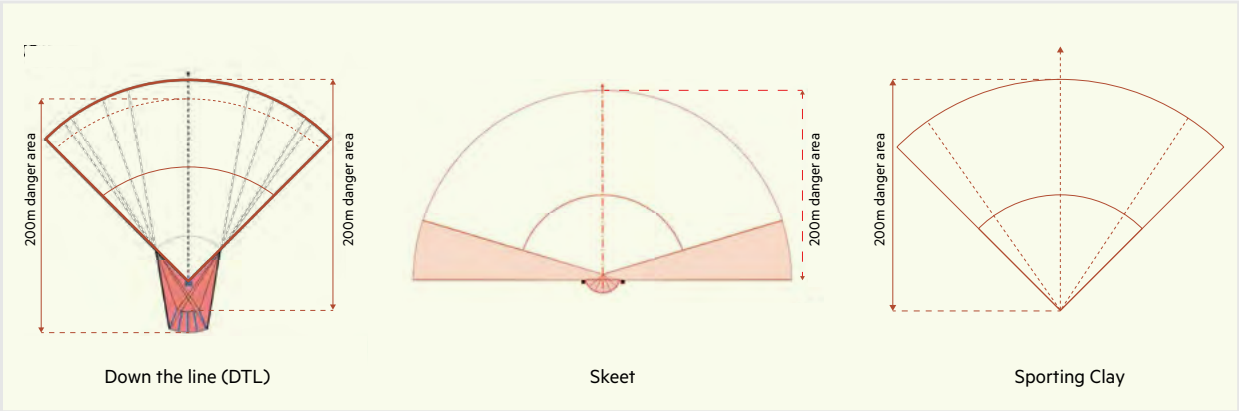


Figure 4.9 - 1:25,000 T7 - T8 Templates (Not to scale)



Note 1: Where steel shot is used, the range danger area is reduced to 150 metres.

Figure 4.10 – Examples of Shotgun Ammunition Danger Area Templates (not to scale)

4.19 *Application of an ammunition danger area template (see figures 4.10 to 4.15)*

1. The application of an ammunition danger area template requires a skill level which can be achieved through training and practice. The purpose of applying a template is to produce a scale diagram on a topographic map of the shooting range danger area. This diagram is included in the shooting range standing orders. Police have provided a training video on how to apply an ammunition danger area template at the clubs and ranges webpage at Clubs and Ranges webpage of Te Tari Pūreke – Firearms Safety Authority.
2. **Types of danger area applications.** There are three main types of application that are explained in the training videos, they are:
    a. **Application 1** - A firing point with a single line of fire (the range axis/direction of fire)
    b. **Application 2** - A firing line with a left and right of arc
    c. **Application 3** - A firing box with a left and right of arc (applying the parallel bearings technique).
3. There are other types of danger areas that can be applied for specific shooting activities where the application of the template is more complex. The Police Clubs and Ranges Team can provide advice for these situations.
4. **Range site survey**. Before practically applying a template to the map, the SRO requires information which has to be gathered during a range site survey (sometimes referred to as a ground reconnaissance). The following information is required and must be recorded accurately:
    a. The grid reference(s) of the firing point/line/box
    b. A grid bearing for the direction of fire (range axis)
    c. A grid bearing for the left and right of arc (where applicable)
    d. **Arc Markers**. Fixed or temporary arc of fire markers can be used to establish a maximum left and right of arc instead of using the extreme flank targets. They can be an easily identified point on a natural topographic feature (i.e. a spot height) or man-made markers which can be permanent or temporary.
    e. The boundary of the land approved for the use as a shooting range (only the section of the boundary relevant to the shooting range location if a large property).
5. **Reduce danger area backstops**. The grid reference of the feature to be used as the backstop to reduce the danger area including any relevant information, e.g. the contour line of the cut-off point, description of the feature(s).

    Note: It is necessary to take the relevant template on the survey so that it can be practically applied for map to ground orientation of the planned range danger area.
6. **No danger area ranges.** Although there is no requirement to apply a template for a no danger area range. A template can be overlayed for the purpose of risk management to assess the impact of a failed range feature which may cause the no danger area criteria to be compromised.

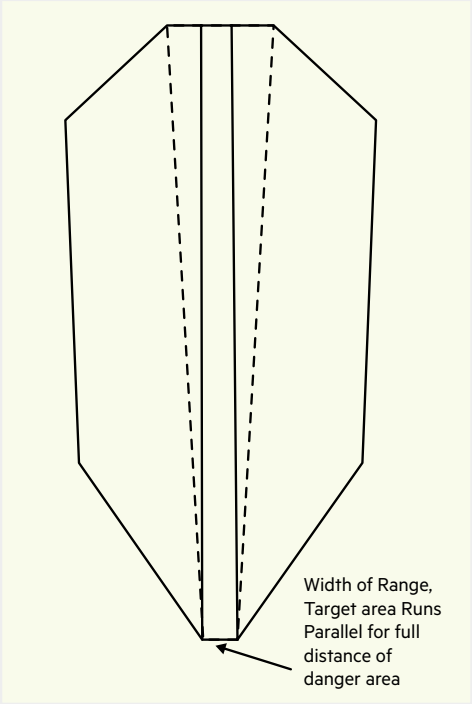


Figure 4.11
Example of a firing line with a left and right of arc

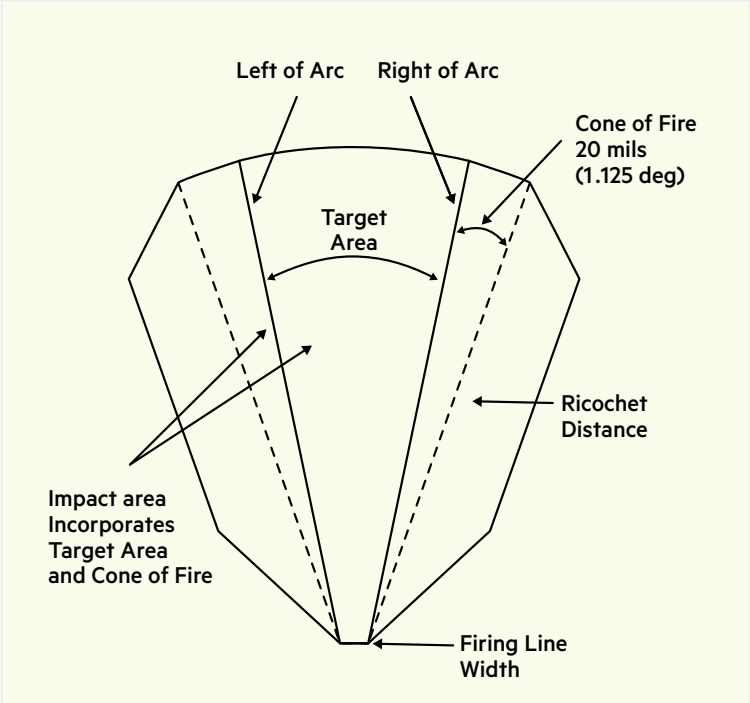


Figure 4.12
Example of template design for field shooting

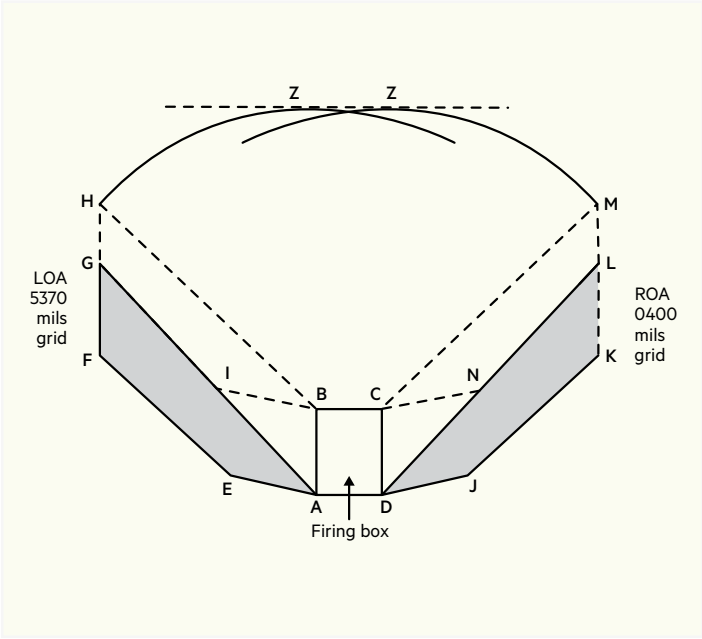


Figure 4.13
Example application of an ammunition danger area template from a firing box using parallel bearings with a maximum left and right of arc applied

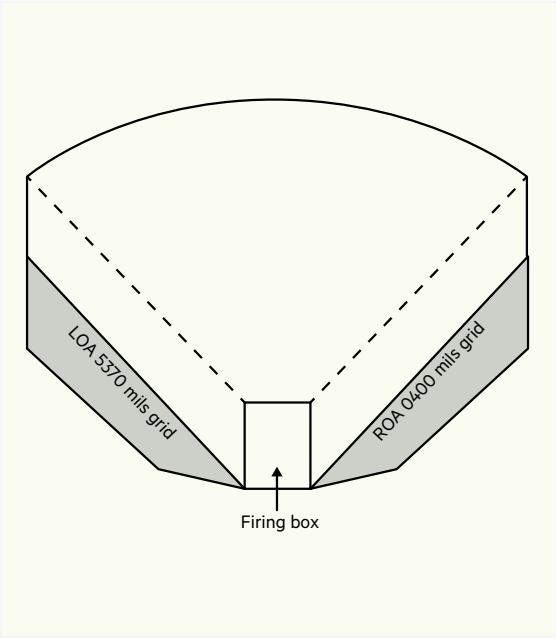


Figure 4.14
Example of a completed firing box using parallel bearings with maximum left and right of arcs

Note: A video explaining the application of an ammunition danger area template can be found at the Clubs and Ranges webpage at Te Tari Pūreke – Firearms Safety Authority website

Air Rifle Ammunition Danger Area Template

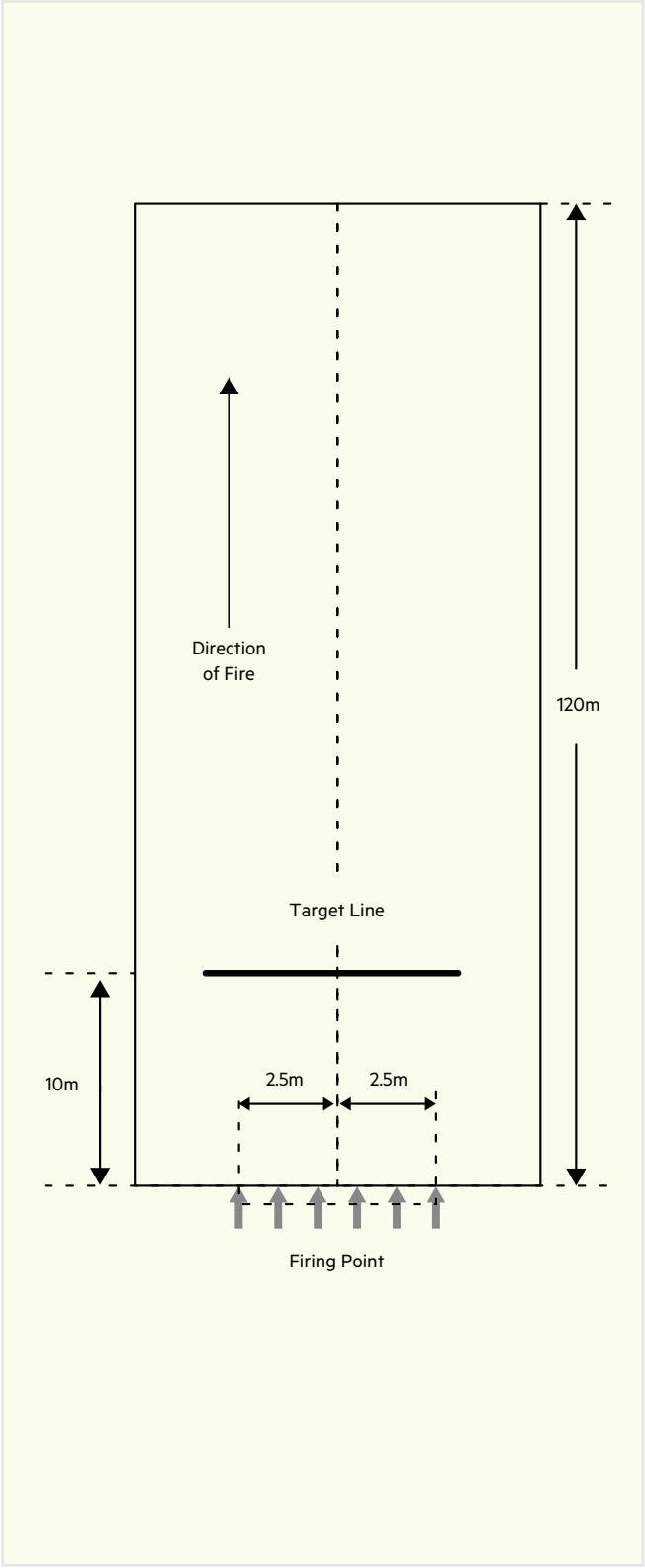


Figure 4.15 – Air rifle 0.177 (up to 12ft lbs)
Outdoor full danger area template
(Not to scale)

Technical Guidance for shooting range certification and enrolment

4.20 The following resources are available to view and/or download from the Clubs and Ranges webpage, Clubs and Ranges webpage of Te Tari Pūreke – Firearms Safety Authority:

a. **Shooting range danger area electronic templating** – There are four power point presentations on the website that explain and demonstrate methods that can be used to determine a shooting range danger area by application of an electronic ammunition danger area template (ADAT):

1) **Method 1 - ADAT Template Electronic Application 1** - Firing point with a single line of fire.

2) **Method 2 - ADAT Template Electronic Application 2** - Firing line with a left of arc and right of arc.

3) **Method 3 - ADAT Template Electronic Application 3** - Firing box with a left of arc and right of arc.

4) **Method 4 - ADAT Template Electronic Application 4** -Shotgun shooting range danger templating using Google Earth.

b. **Electronic ADAT library.** An electronic template library (in MS Powerpoint format) is available for you to download from the website so that you can copy and paste your selected ADAT for practical application. It is not necessary to download the complete file.

c. Shooting range danger area manual templating – There are three videos that explain and demonstrate methods that can be used to determine a shooting range danger area by manual application of an ADAT. The videos can be paused, stopped, replayed or downloaded at your convenience.

1) **Method 1 - ADAT Template Manual Application 1** - Firing point with a single line of fire.

2) **Method 2 - ADAT Template Manual Application 2** - Firing line with a left of arc and right of arc.

3) **Method 3 - ADAT Template Manual Application 3** - Firing box with a left of arc and right of arc.

d. **Manual ADAT library**- A library of ADATs drawn to 1:50,000 and 1:25,000 scale are available for download from the website. The use and application of these ADATs is detailed in this section. To help draw the scale diagram of the range danger area, print the selected ADAT then photocopy it onto an overhead projector transparency film, then apply it to a map of the area to the same scale.

Control of access to the range and the danger area

4.21 The shooting range operator must have control over access to the range and any associated range danger area (where applicable) at all times while the range(s) are in use. This control can be (but is not limited to) using physical barriers, signage (including warning flags), visual observation, written/verbal agreements between affected parties etc. Range standing orders will list and explain any relevant control measures including a procedure where a breach occurs.

Shooting range signage

4.22 Range and danger area signage is required for all ranges except as set out in paragraph 4.25. Signs must be of durable construction to weather resistant. The signs act as a clear warning to anyone approaching the shooting range and/or range danger area of the danger and associated risks of proceeding past the sign without authoristion.

Shooting range entrance signage

4.23 There must be a sign at the main entrance to a shooting range and any secondary or alternate access point to the range. Secondary of alternate access point signage may not require as much information as the main entrance sign. Signage must contain the range or range complex name, contact details for the shooting club or shooting range operator (e.g. phone number, website or email address) and a warning that the person is entering a shooting range. If a flag is used at a range, there must be a sign by the flag explaining what a raised flag means and clearly stating any restrictions on access.

Shooting range danger area signs

4.24 Danger signs must be positioned around the perimeter of the overall range danger area to identify the external boundary of the range. The intention of these signs is to alert people of the range and range danger area boundaries. Signs must face outwards from the range danger area and be spaced at intervals so they are clearly visible to anyone who might approach the range. They must clearly warn people not to enter the range danger area, with wording such as **'DANGER, Firing Range, Keep Out'**. Range danger area signs must remain visible at all times and not obscured by brush or vegetation. They should be of a colour and size that can be identified from approximately 100 metres away (this may not be possible in some environments). Perimeter signs should be checked periodically as part of the range maintenance plan to ensure they are in good order and all graphics and wording remain legible.

Alternatives to range danger area signs

4.25 If permanent danger area signs are not practicable for use on temporary non-pistol shooting ranges or non-pistol field shooting ranges, portable range danger area signage must be placed at all known vehicle or foot traffic access points into the range danger area (where practical).

4.26 Where the use of a portable range danger area signage is not practicable all reasonable measures must be taken to reduce the risk of unauthorised entry. Evidence of these control measures will be required for enrollment of temporary non-pistol shooting ranges or non-pistol field shooting ranges, such as an assurance from the landowner that access to the property is restricted to participants of the approved shooting activity. If signs are not to be used this must be included in range standing orders for the purpose of enrolment.

Red Warning flags

4.27 A range complex or individual range complex or individual range must fly a large RED warning flag to indicate that the range is in use. The flag must be of a size and condition to stand out and be visible from the access point to the range. The flag must be flown from a flagpole at a height that can be easily seen. The flag should be a minimum dimension of 600 mm x 1200 mm. Indoor ranges are not required to display a range flag but must control entry into an active range area by signage, a locked access door (secured from the inside), warning lights (operation controlled from the inside) or a combination of these.

4.28 The flagpole needs to be in a prominent position, clearly visible to those approaching the range. If there is more than one entry point to the range and they are not visible to each other, then a flagpole is required at each entry point. The location and number of flagpoles depends on the design and layout of the range or multiple ranges at one site. Flagpoles must not be placed in a location that poses a hazard to anyone operating the flags, e.g. not on a backstop where, due to the presence of an adjacent range, the flag operator would be exposed to fire from that range.

4.29 The range or site with multiple ranges warning flag(s) Where warning flags are used on individual ranges within a range complex, respective range in use warning flags are to be raised before shooting begins and lowered when it ends. If the range is used for night firing activities, the red flag(s) are to be replaced by suitably visible red flashing lights. There must be signage at the location of each range or multiple range site warning flags that

explains what a raised flag means and clearly state the restrictions on access.

4.30 Depending on the design and layout of the range, a range flag may be required for each individual range where the range is part of a larger site with multiple ranges. This may extend to each bay where multiple shooting bays form part of the range. Range flags must clearly identify which ranges or bay is in use at any given time. Range flags for individual ranges are to be raised before the shooting activity begins and lowered when it ends.

Alternate red warning flag requirements

4.31 Some shooting disciplines such as skeet and trapshooting may use a system of red and green signal flags and/or light systems. The correct operation of these flags and light systems must be clearly explained in their respective range standing orders and/or match rules.

4.32 Temporary non-pistol shooting ranges (e.g. sporting clay field shooting ranges) generally do not have the infrastructure to establish flagpoles or flag stations and therefore are not required to display warning flags (unless a temporary method is available for use). In lieu of a warning flag, a portable warning sign (a sandwich board style or a sign fit for purpose) must be placed at the main access point to the location of the shooting activity. The range standing orders must also describe procedures for controlling other potential access points into the shooting range danger area.

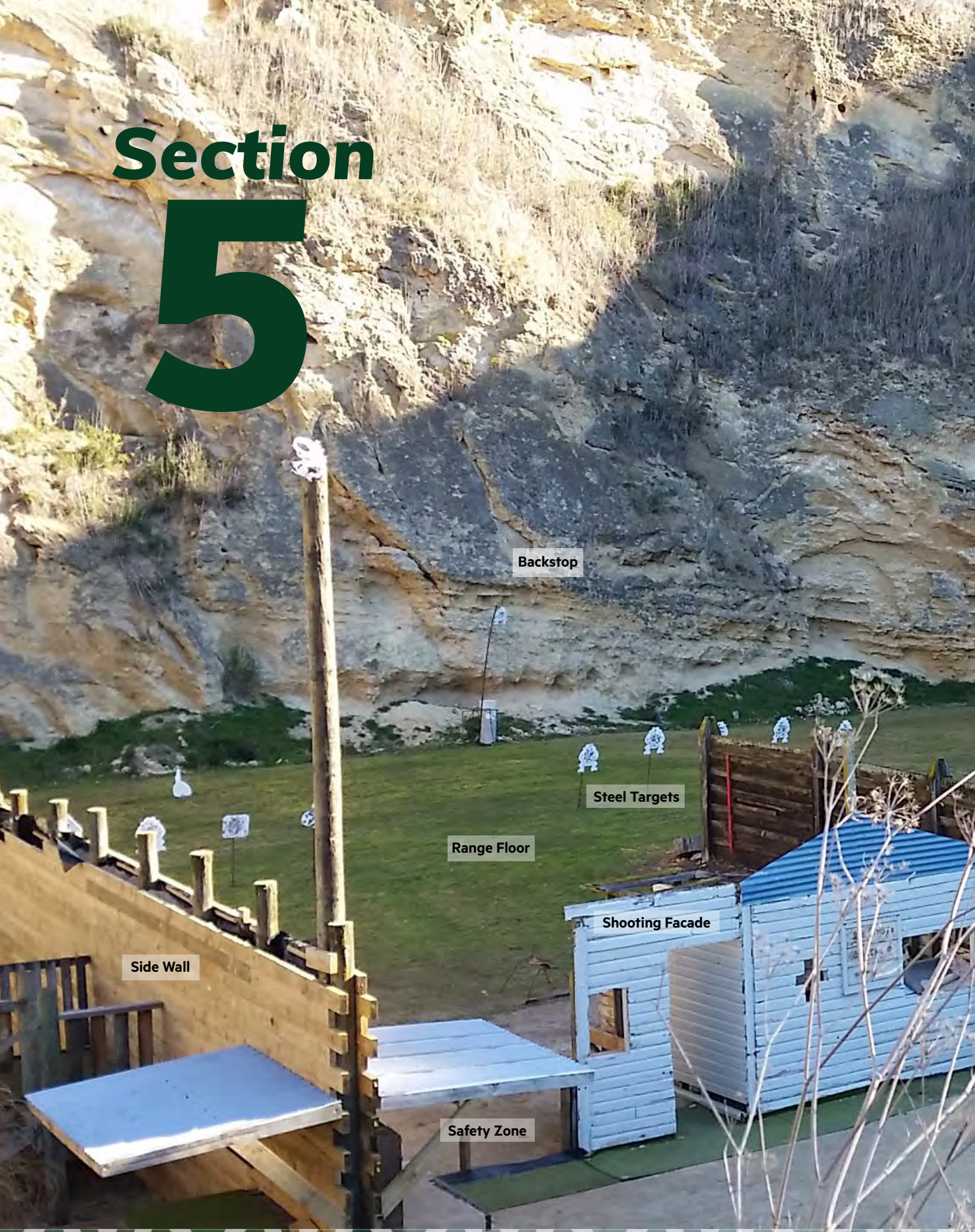
Wind flags

4.33 The location of any wind flags used on a range must not interfere with shooters or obscure the view of the active range area from the shooters or officers on duty.

4.34 Wind flags must be of a different shape and colour to all warning flags in use on the range. This is to avoid confusion over their meaning.

! The officer on duty must stop all firing immediately when intrusion into the shooting range danger area has been identified.

Section 5


Backstop
Steel Targets
Range Floor
Shooting Facade
Side Wall
Safety Zone

Section 5
Range standing orders

Introduction

5.1 Range standing orders (RSOs) are a document that details the management procedures, firearm and ammunition restrictions and conditions of use for the safe operation of the shooting range. They are required to ensure that all necessary precautions are taken to prevent the occurrence of accidents or incidents to range users and danger to the public.

5.2 Shooting range operators are responsible for the production of range standing orders, they may be written for an individual range or multiple ranges located on the one site operated by the same shooting range operator. The shooting range operator is also responsible for ensuring that all range users comply with the range standing orders for the range.

Risk assessment

5.3 A shooting range operator may have obligations under the Health and Safety at Work Act 2015 as person conducting a business or undertaking (PCBU). In such cases, it is recommended that a site-specific risk assessment is conducted. WorkSafe New Zealand provides guidance on the responsibilities of a PCBU.

Approval of RSOs

5.4 An application for certification, enrollment, or renewal of certification (Pistol ranges only) and a notification for a temporary non-pistol shooting range must include a copy of RSOs. Pistol shooting ranges, non-pistol shooting ranges and temporary non-pistol shooting ranges that are not affiliated to an association must have their range standing orders approved by Police. Non-pistol shooting ranges and temporary non-pistol shooting ranges that are affiliated to an association will have their RSOs approved by their respective association and must provide evidence that they have been approved by their association.

5.5 The RSOs for each individual or multiple-site shooting range complex must be approved by the respective shooting range operator before they are submitted to Police for certification, enrollment or receipt of notification.

5.6 Notification of changes to RSOs

a. Shooting range operators of pistol ranges, non-pistol shooting ranges must notify Police of any intended changes to their RSOs that will affect the ballistic characteristics or the safe operation of their range(s). These changes can only be made with the prior approval of Police.

b. Shooting range operators of non-pistol shooting ranges and temporary non-pistol shooting ranges that are affiliated to an association must notify their respective association of any intended changes to their RSOs that will affect the ballistic characteristics or the safe operation of their range(s). These changes can only be made with the prior approval of their respective association or Police if the association does not have their own published standards.

c. Shooting range operators of temporary non-pistol ranges that are affiliated to an association must provide evidence that their RSOs have been approved by their respective association at the time of notification, or Police if the association does not have their own published standards.

Notification to all range users

5.7 The shooting range operator must make the current version of the range standing orders accessible to all range users, whether in electronic or hard copy form, and provide notification of any approved amendments to the range standing orders. It is recommended that the shooting range operator displays the current version of the range standing orders on a noticeboard and/or website (if applicable).

5.8 All persons trained as officers on duty are to routinely review range standing orders to refresh themselves on safe range operation which will include any approved amendments.

Range standing orders – Contents/guide/template

5.9 The contents of range standing orders are organised by using a list of mandatory headings to ensure that all relevant aspects of range safety management are included. These headings provide a level of consistency for all range standing orders and allow for inclusion of specific shooting discipline requirements, e.g. shooting activities specific to

shotgun, black powder, indoor etc. Where a heading may not be relevant to the specific shooting discipline, not applicable (N/A) should be entered. (do not delete the heading as this will confirm that the heading has been considered). It is recommended that the headings follow the same order as listed in the guide.

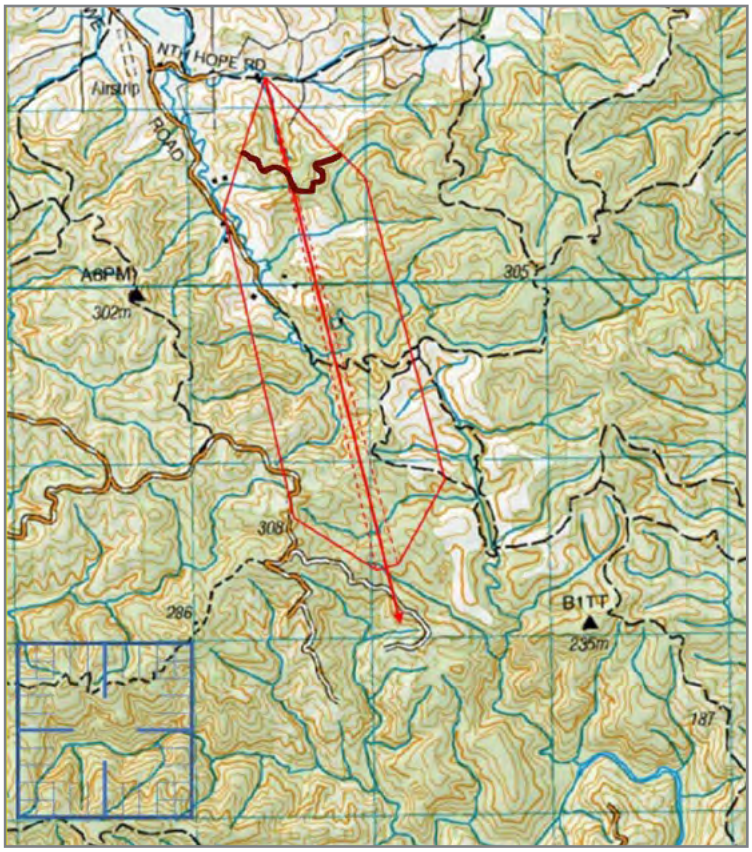
5.10 A guide for the compilation of a set of range standing orders has been included at the end of this section. The guide provides and explanation and examples of the type of information required under each heading. If a shooting discipline has additional information that needs to be included in their range stranding orders, it is recommended that this information is included in section 33 (do not create a new heading).

5.11 A range standing orders MS Word Document template has been developed to assist shooting range operators to compile and produce shooting range standing orders to a consistent national standard. It is recommended that shooting range operators use the template, however, shooting disciplines may use their own templated format as long as all mandatory headings are included. The template can be accessed from the clubs and ranges webpage of Clubs and Ranges webpage of Te Tari Pūreke – Firearms Safety Authority website.

5.12 Non-Pistol and Temporary Non-Pistol shooting ranges that are affiliated to an association may produce RSOs approved by their respective association to a standard set by their association. The Commissioner may request further information if it has been identified that these range standing orders may not meet the requirement for safe operation of the shooting range(s). All other shooting range standing orders must comply with this manual.

Inability of a shooter to achieve and maintain the range design CofF

5.13 The inability of a shooter to achieve the range design CofF is a risk as projectiles may escape the range danger area. This could be the result of misdirected, random, or wild firing. Range standing orders must set out corrective actions if a shooter is unable to achieve the the range design cone of fire. If unable to correct the error, the shooter must cease shooting. For shotgun shooting activities, the officer on duty is to apply the same process where a shooter is not able to achieve or maintain their respective shot-spread within the designated arcs of fire.



Range name:
Whangarei Rifle Range

Map Reference:
NZTM Map Sheet AW30 Whangarei 1:50,000

ADAT:
T6 Centrefire

FP:
E1725412 N6061146

Range Axis:
165°

RDA:
Defined by the 200m contour line which is past the 550-metre target (marked approximately by the red/ brown line in this diagram.

Figure 5.1 – Example of the scale diagram of the range danger area and supporting information required for inclusion in RSOs (where applicable)

Range danger area description

5.14 A description of the range danger area can be included in section 10 as part of the individual range description. Reference can be made to the relevant annex for the scale diagram and specific details of the range danger area (where applicable). A no danger area (NDA) range does not require a reference to a scale diagram of the range danger area in the annex.

5.15 When a range danger area scale diagram has been produced, it must have the following explanatory notes annotated within the diagram or inserted as part of the marginal information included with the diagram (see figure 5.1):

a. Range name/number.

b. ADAT applied (e.g. T6).

c. Map sheet reference number.

d. Grid reference to the furthest firing point/ line (in NZTM) from where the template has been applied (and the closest firing point from where the closest firing point to where the template has been applied if applicable).

e. Range axis (direction of fire) in degrees as a grid bearing.

f. Left and right of arcs in degrees as a grid bearing (if applicable)

g. Description of the cut off point for a reduced danger area range (if applicable).

h. A description or outline of the approved land boundary or any other relevant information (if applicable).

Provision for restricted weapons, prohibited firearms and magazines

5.16 Restricted weapons/Prohibited firearms and magazines may be permitted for use on a certified or enrolled shooting range where they have been approved by the shooting range operator and included in section 10 of range standing orders. The firearms licence holder must have the appropriate endorsements for their respective firearm or magazine to be used. No other person may fire these firearms under any circumstances.

Individual range summary sheet

5.17 It is recommended that each shooting range has a range summary sheet displayed listing the relevant restrictions and conditions of use specific to that range, e.g. an extract from section 10 of the range standing orders listing the approved firearms and calibres. These sheets provide a brief summary to all range users of the operating restrictions and conditions of use for the range but does not remove the requirement to have the current version of the range standing orders available and/or accessible to all range users. An example of a summary sheet is at figure 5.2.

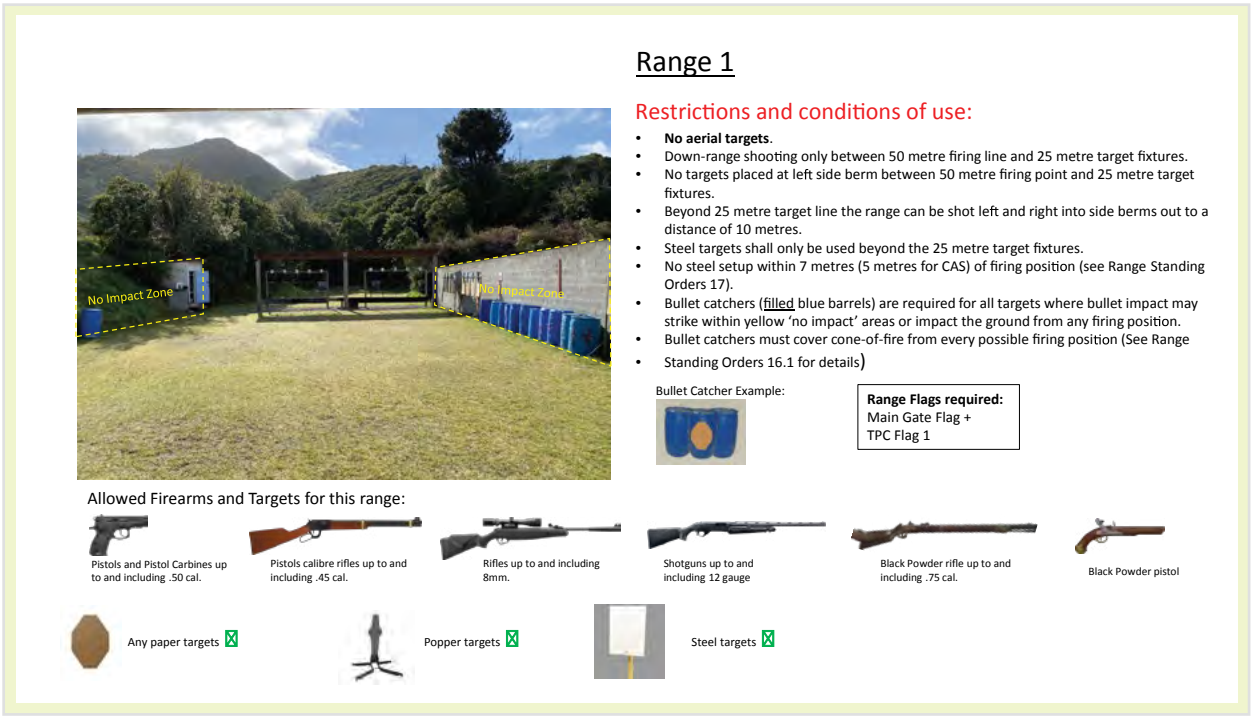


Figure 5..2 – Example of RSOs individual range summary sheet

Guide for the compilation and production of range standing orders

(If a heading is not relevant to your range operation, do not delete the heading, insert N/A for not applicable.
This is to ensure a consistent standard is maintained for all Police approved RSOs)

The Shooting Range Operator (SRO) is responsible for producing the Range Standing Orders (RSOs)	
1	**Shooting Range/Multi-Range site name**
2	**Shooting Range name or number** *(if an individual shooting range(s) if applicable)*
3	**RSOs date** *(date RSOs were authorised)*
4	**Introduction** *(Information to be included)*
	1 Information about the range 2 The legal title of the land on which the range is located, and any associated land affected by the range danger area (if applicable) 3 The name of the landowner(s) or controlling authority approving the use of their land as a shooting range 4 Hours of operation
5	**Responsibility** *(Information to be included)*
	1 Name of the (SRO), (who is responsible for the overall safe operation of the range), and 2 The person/entity/committee in charge of the day-to-day administration, management and maintenance of the range
6	**Compliance with Range Standing Orders (RSOs)** *(Information to be included)*
	1 Statement directing that all range users must comply with RSOs 2 Describe the consequence of non-compliance with RSOs
7	**Range location** *(Information to be included)*
	1 Physical street address of the range 2 NZTM map sheet number and grid reference
8	**Approved range users and priority of use** *(Information to be included)*
	List approved range users/organisations and their order of priority for range use and bookings (if applicable)
9	**Warning flags, warning lights and danger signs** *(Information to be included)*
	1 Locations of warning flags and warning lights (if applicable), danger signs and their use 2 Flag locations may be included in Annex A – Range location and layout
10	**Description of individual ranges, restrictions, and conditions of use** *(in numerical order - information to be included)*
10.1	**Range 1 - Description**: 1 Maximum firing distance, indoor/outdoor, type of shooting discipline and type of range danger area e.g., 50m Outdoor Pistol RDA range Range danger area – A description of the range danger area (if applicable) 2 *Where a range is designated a FDA or RDA range, a scale diagram of the range danger area is to be included as an annex (a scale diagram is not required for a NDA range) For an RDA range, the designated cut-off point for the reduction of the of the danger area is to be clearly defined*
	Range 1 – Restrictions: List the restrictions of the firearm calibres and ammunition approved for use on the range. This can be expressed as the maximum calibre, cartridge, muzzle velocity or muzzle energy, or a combination of the afore mentioned where necessary, e.g., *List the restrictions of the firearm calibres and ammunition approved for use on the range. This can be expressed as the maximum calibre, cartridge, muzzle velocity or muzzle energy, or a combination of the afore mentioned where necessary, e.g.,* *1 Pistols up to and including 0.50in calibre with a muzzle velocity no greater than 1600 fps (488 m/s).* *2 Rifles up to and including 8mm.* *3 Shotguns up to and including 12 gauge with a muzzle velocity no greater than 1350 fps* *Shot size up to and including 2.4mm with a shot weight no greater than 28 grams* *Explanatory note:* *4 Some modern firearms may exceed the calibre restriction but not the muzzle energy restriction. In such cases, as long as the*

Table 5.1 - Guide for the compilation and production of range standing orders

	firearm is within either the calibre or muzzle energy restriction for the range it may be approved for use
	Range 1 – Conditions of use: List the conditions of use specific to this range e.g., 1 Range 1 must be closed for use when Range 2 is in operation. 2 Down range shooting only 3 All shooting must be from the prone supported position only 4 All shooting must be from the shooting bench at the 100m firing point only
	Explanatory note: *For multiple ranges, copy and paste the complete Range 1 format and insert it after Range 1, for the additional number of ranges required and renumber accordingly, e.g.* *10.2 Range 2:* *a. Description* *b. Restrictions* *c. Conditions of use* *10.3 Range 3:* *a. Description* *b. Restrictions* *c. Conditions of use*
11	**Range safety roles** *(Information to be included)*
	Describe the requirements for duty officers/ officers on duty/range officers and any other persons with a designated role for managing range safety: *1. RSOs must state as a minimum that an officer on duty has a firearms licence and is appropriately trained in shooting range safety management and is to be on duty for each individual range at all times when in use* *2. RSOs may state the requirement for any additional safety roles for the safe conduct of a shooting activity*
12	**Range safety rules** *(Information to be included)*
	1 Generic safety rules for the use of the range 2 Any specific requirements before, during and after shooting (where applicable) 3 Approved shooting activities 4 Developed shooting activities must be reviewed for approval by the shooting range operator before inclusion in RSOs.
13	**Ammunition use** *(Information to be included)*
	Describe any relevant criteria regarding ammunition that is not required in Section 10 under restrictions. *Describe the procedure for the introduction of new ammunition, e.g.,* *If a new type of ammunition is proposed for use on the range, it must be approved by the SRO. Before inclusion in the RSOs, the requirements of section 34 of these orders are to be adhered to.*
14	**Targets** *(Information to be included)*
	1 Describe approved soft and hard target types to be used 2 Describe the correct placement of targets 3 State the approved target centre height(s) for all respective targets and target locations 4 Describe the procedure for approval and use of new targets and/or target systems 5 Describe the use of a shotgun pattern board (if applicable).
15	**Steel targets** *(Information to be included)*
	Describe the procedure for the use of approved steel targets *Describe the grade of steel approved for steel targets* *Describe the procedure for inspecting and maintaining steel targets to a safe and serviceable standard*
16	**Moving targets** *(Information to be included)*
	Describe the procedure for the operation of moving targets (if applicable)
17	**Minimum safe engagement distances** *(Information to be included)*
	List the minimum safe engagement distances by shooting activity, firearm calibre, ammunition type and target type.
18	**Hearing and eye protection** *(Information to be included)* Describe the requirements for the use of hearing and eye protection

19	**Medical and emergency** *(Information to be included)*
	1 Describe the location of the first aid/medical kit 2 Describe a suitable method (cell phone/landline/radio) to contact emergency services 3 Describe the location or address of the closest medical facility if evacuation of a casualty is required
20	**Accident/incident procedure** *(Information to be included)*
	20.1 Describe the procedure in the event of an accident/incident on the range during live firing not involving a firearm which results in a non-urgent injury or where an injury could have occurred (i.e. a near miss) 20.2 Describe the procedure in the event of an accident /incident on the range during live firing involving a firearm or ammunition which results in serious injury or death
21	**Fire precautions and procedures** *(Information to be included)*
	1 Describe the location of any onsite fire alarms and equipment (if applicable) 2 Describe the evacuation procedure in the event of a fire 3 Describe any relevant seasonal fire restrictions that must be complied with (if applicable)
22	**Range clearance** *(Information to be included)*
	Describe the procedure for clearance (and clean up) of the range at the completion of all shooting for the day (or night)
23	**Range design Cone(s) of Fire (CofF)** (Use Arc of Fire where applicable for shotgun)*(Information to be included)*
	List all approved range design cone(s) of fire for all ranges (or arcs of fire for shotgun ranges)
24	**Unauthorised access and/or use of the range** *(Information to be included)*
	Describe the procedure for managing any unauthorised access or intrusion to the range and/or range use
	Range intrusion procedure Describe the procedure taken when an intrusion is about to occur or has occurred
25	**Inability of the shooter to achieve the range design CofF** *(Information to be included)*
	Describe the procedure for validating and monitoring the ability of a shooter to achieve and maintain the approved range design CofF, and the corrective actions if a shooter is unable to do so
26	**Un-licenced or inexperienced shooters** *(Information to be included)*
	Describe the procedure for managing an un-licenced or inexperienced shooter on the range. The requirements of the Arms Act 1983 must be adhered to as a minimum for un-licenced shooters
27	**Test firing**
	Describe the procedure for managing test firing of firearms and/or ammunition on the range. Test firing does not include sighting-in or zeroing. The SRO must approve any type of test firing.
28	**Air danger height (ADH)** *(Information to be included)*
	1 List the approved ADH for the range (if applicable) 2 Describe the procedure for aircraft intrusion over the range danger area 3 Describe any procedure required by agreement with the local aerodrome(s) or CAA for use of the range (if applicable)
29	**Range maintenance plan** *(Information to be included)*
	1 Provide a range management plan (or reference to) which schedules regular maintenance checks of the range(s) e.g. detailing the requirements for checking and refurbishment of the bullet catcher fill material (if applicable), the standard of the range maintenance will be assessed against the range maintenance plan
30	**Children (minors)** *(Information to be included)*
	Describe the rules for supervision of children (minors) on the range
31	**Health and hygiene** *(Information to be included)*
	Describe the rules for relevant health and hygiene procedures, e.g. *washing hands before handling food after shooting*
32	**Domestic animals** *(Information to be included)*
	Describe the rules for allowing domestic animals on the range

33	**Additional headings** *(Information to be included)*
	List any other information deemed necessary for inclusion in the RSOs for the safe management and operation of the range, e.g., *1 Rules for the use of the carpark* *2 Security procedures for entry and exit to the range complex or a specific range(s)* *3 Additional range safety rules for specific shooting activities* *4 Additional conditions for use of specific firerms, e.g. Blackpowder cannons and mortars*
34	**Amendment to RSOs** *(Information to be included)*
	Describe the procedure for approval of amendments to RSOs *NB: Police must be notified of any proposed amendment to RSOs for review and prior approval (for Pistol shooting ranges and non-pistol shooting ranges that are not affiliated to an association only)*
35	**Authorisation of RSOs** *(Information to be included)*
	State who authorised the RSOs, e.g., *1. These RSOs have been authorised by the XXXX Club Inc. Committee, or* *2. These RSOs have been authorised by the XXXX (name of the SRO)* *NB: There is no need for a signature or date in this section.*
36	**Distribution list** *(Information to be included)*
	List all approved range users and associated organisations who will be sent a copy of the RSOs
37	**Annexes** – (specific information required to supplement content in the main body - information to be included)
	List the Annexes in alphabetical order, each annex should be presented on an individual page for clarity, e.g. **A - Range location and layout** 1. A google earth image or Topo50 Map image indicating the geographical location of the range/range complex 2. A google earth or Topo50 map or diagram of the plan view of the range/range complex (may include flag locations)
	B - Range danger area 1. A scale diagram illustrating the FDA/RDA including the boundary of the land approved for use as a shooting range, this is not required for a NDA range. 2. This diagram must also list the grid reference(s) to the firing point/firing line/firing box, range axis, left and right of arcs (if applicable), the ammunition danger area template used. 3. For an RDA range, the designated cut-off point for the reduction of the of the danger area is to be clearly defined.
	C - Additional shooting organisations Where more than one shooting organisation uses the range, specific rules for their discipline can be added as an annex. They must not contradict these RSOs. The annex must be reviewed and approved by the SRO for inclusion in these RSOs, e.g. A Police Annex is required if NZ Police use the range
	D - Any other relevant information Information, tables and images that are more suited to be included as an Annex to reduce clutter in the main body of the RSOs, e.g. A table of equivalency for approved firearms and ammunition

Section 6


Bullet Catcher
Target Holders
Side Berm
Target Line
Range Floor
RANGE
CLOSED

Section 6
Shooting range closure

Shooting range closure

6.1 A shooting range may be closed for a temporary period or closed permanently. Where a shooting range has been closed temporarily or permanently, the shooting range operator must take steps to clearly indicate that the shooting range is closed, e.g, range closed signage.

Temporary closure

6.2 A shooting range operator may close a shooting range temporarily for the purpose of administration, scheduled maintenance, unplanned repair work or due to an adverse weather event such as flooding. The shooting range operator is not required to notify Police in such circumstances and may reopen the range when appropriate.

6.3 A shooting range operator must immediately cease operations on a range when they identify continued operations will endanger the safety of the public or range users. The shooting range operator must temporarily close the range until the circumstances are investigated and any remedial action is completed to ensure the safe operation of the range. The shooting range operator may reopen the range when it is confirmed safe to do so. If it can be confirmed that the safety of the public has been exposed to potential risk, e.g. projectile overshoot, then the shooting range operator must report the circumstances to Police.

6.4 Any individual using a range who considers the range unsafe must cease using it and report the circumstances as soon as practical to the shooting range operator or member of the club executive committee. On receipt of this notification, the shooting range operator or club committee must close the range temporarily until they can validate the circumstances of the report. The shooting range operator or club committee may reopen the range when it is confirmed safe to do so.

6.5 Where a member of the public reports a shooting range to be unsafe, a member of Police constabulary may direct that the range(s) cease operation temporarily until the circumstances of the report can be investigated. The clubs and ranges team may be required to assist with the investigation. Police may direct that the range can reopen when it is confirmed safe to do so, or issue an improvement notice to remedy any condition(s) of certification or enrolment that have not been met.

6.6 A member of Police conducting a regulatory shooting range inspection may issue an improvement notice where it is identified that a shooting range does not comply with or the conditions of certification or enrolment have not been met. The conditions stated in the improvement notice may require the shooting range operator to temporarily cease operation until remedial action has been taken to ensure the safe operation of the range. If the shooting range operator does not cease operations Police may suspend certification or enrolment.

6.7 A member of Police may temporarily suspend the operations of a shooting range if the member is satisfied that the shooting range has failed to comply with an improvement notice.

Permanent closure

6.8 If a shooting range operator fails to comply with an improvement notice and the Police review during the period of the suspension notice, concludes that the range can no longer meet the conditions of certification, Police will cancel range certification or enrolment.

6.9 Where the owner (or controlling authority) of the land, on which the range and/or danger area is situated, withdraws authority for the use of the land as a shooting range (e.g. if the lease or licence is terminated), the shooting range operator must inform Police and cease using the range when the authority has ended. If the shooting range operator is unable to obtain a new authority to use the land, then the range must cease operations. Police will review the situation and confirm that the range can no longer be operated under the conditions of certification or enrolment. Once confirmed, Police will cancel range certification or enrolment.

6.10 A shooting range operator may voluntarily surrender the certification or enrolment. of a shooting range by notifying Police. Police will review the notification and confirm the details for permanent closure of the shooting range with the shooting range operator. On confirmation, Police will cancel range certification or enrolment.

Decommissioning

6.11 When a shooting range is to be decommissioned and closed permanently, Police will cancel the range certification or enrolment. All range signage and range structures should be removed to ensure there is no continued use of the shooting range by any person. Other remediation may be required by the landowner or occupier.

Section 7

Section 7
Zeroing (Sighting-in / Sight adjustment) conducted on private/public land

Zeroing (Sighting-in / sight adjustment)

7.1 Where possible zeroing (sighting-in) that is done by an individual or a small group of individuals (but not a shooting club) on a one-off or occasional basis (e.g. before a hunting trip or duck-shooting season), should be conducted on a certified or enrolled shooting range. Where a certified or enrolled shooting range is not available and/or practical, zeroing (sighting-in) can be carried out on private or public land with the permission of the landowner or respective controlling authority. The following must be considered:

a. Identify an area of land that you own, control or have permission to shoot on. It should be away from populated areas and selected so as not to endanger, frighten, or annoy members of the public, where there are no buildings or human activity. Buildings in the danger area that are not at risk of direct impact must be vacant of human activity when shooting, such as an implement shed.

b. Select a safe backstop within the area (this is critical). A large bank or hill immediately behind the target is recommended. Trees or vegetation without solid ground behind them do constitute a reliable backstop. The steeper the slope of the natural hill feature the better as it reduces the potential for ricochet.

c. A rifle bullet can travel several kilometres even after a ricochet, therefore the direction of fire should be oriented so that the fall of shot area extending beyond the target does not contain roads, dwellings, buildings or areas of human activity. Ideally the bank or hill (backstop) immediately behind the target should be high enough to contain direct impact and potential ricochets.

d. Avoid hard or stoney surfaces likely to cause a ricochet or backsplash. If a ricochet is heard when shooting, stop shooting and select a more suitable location.

e. Select an area where you have control and full visibility of anyone entering the danger area. Avoid selecting backdrop areas where members of the public or people such as farm staff might enter the danger area without your knowledge Check for roads, tracks, access-ways or river flats where you don't have full visibility of the danger area.

f. Select targets that will not create a ricochet or backsplash e.g. paper, soft timber or suitable steel targets (positioned correctly). Targets should be placed centrally at the base of the backstop (bank or hill) to ensure all bullets will be captured by the backstop.

g. Avoid areas with livestock within the danger area although it is acceptable to shoot where stock are outside of the direct impact area for the sighting-in.

h. Ensure that everyone handles firearms safely and follows the seven rules of firearms safety.

i. Areas set up for and routinely used by the public or a shooting club for sighting-in must be certified as a shooting range or be an enrolled shooting range.

7.2 For further guidance refer to section 6 (Preparing your firearm for use and zeroing) of the Firearms Safety Code.

Section 8

Section 8
References and acknowledgements

References

8.1 When developing this manual the following international publications were used for reference:

a. UK Ministry of Defence: Defence Safety Authority, Defence Ordinance munitions & Explosives Safety Regulator (2020) DSA 03.OME, part 3, volume 2 –Defence code of practice and guidance notes for ranges.

b. Royal Canadian Mounted Police (2007) Range design and construction guidelines. The Canadian Firearms Centre, Canada, 2007.

8.2 Police also used shooting range publications developed by national and individual shooting organisations listed below, as a point of reference for specific shooting disciplines:

a. New Zealand Clay Target Association.

b. New Zealand Deerstalkers Association.

c. Pistol New Zealand.

d. National Rifle Association of New Zealand.

e. Target Shooting New Zealand.

f. New Zealand Black Powder Shooters Federation Inc.

g. Field Shooting New Zealand.

h. The Amateur Trapshooting Association.

i. The New Zealand Air Rifle Field Shooting Target Association.

8.3 The Police shooting range manual is to take precedence over all source documents relating to pistol shooting ranges and Non-pistol ranges who are not affiliated to an association. Police may approve the use of specific range design criteria that deviates from this manual where it is satisfied that any certification or enrolment against the range design criteria will not impact the safe operation of the shooting range. The shooting range operator is responsible to ensure that all shooting activities will adhere to the conditions of that range certification or enrolment. Requests for any such deviations are to be made to Police including any relevant supporting documentation for review and a decision.

Acknowledgements

8.4 Police recognises Pistol New Zealand and the New Zealand Defence Force for their contribution to the production of this manual. Relevant parts of this manual have been reviewed by the Weapons and Range Safety Branch of the New Zealand Army, and by Mr Frank Compton (Maj Retd) MBE, Range Safety Advisor and international subject matter expert.

Range Certification Engagement Group

8.5 During the development of this manual the range certification engagement group was established to ensure the inclusion of key stakeholders within the firearms target shooting community of New Zealand. Members representing key stakeholder groups contributed subject matter expertise, peer review and feedback during and after the development of this manual. Key stakeholder groups are listed in table 8.1 below.

ORGANISATION
Council of Licensed Firearms Owners
Field Shooting Advisory Group
Firearms Safety Council of Aotearoa New Zealand
Gillice Practical Rifle Events
Gunsafe Firearms Safety and Education
New Zealand Clay Target Association (also representing the New Zealand Shooting Federation)
New Zealand Deerstalkers Association
New Zealand Game Animal Council, Federated Farmers of New Zealand, Professional Hunting Guides Association
New Zealand Army Weapons and Range Safety Branch
New Zealand Police - Clubs and Ranges
National Rifle Association of New Zealand
Pistol New Zealand (also representing the New Zealand Service Rifle Association)
Target Shooting New Zealand

Table 8.1 - Range certification engagement group

Te Tari Pūreke
Firearms Safety Authority

New Zealand Police

Shooting Range Manual

Te Tari Pūreke – Firearms Safety Authority, a business unit of New Zealand Police