

# Western Australian Police

## Guidelines to Firearm Ranges & Standards of Approval

### Requirements:

- Qualified Risk Assessor

### Methodology:

- WAPOL – Firearm Ranges, Standards of Approval will provide the basis on which all current and proposed firearm range will be approved.
- Check list cover sheets will be completed in each instance where an inspection of a range is undertaken.
- The check list cover sheet is applicable to all range types and will be provided as part of a Range Inspectors information package.
- An appendix relative to the particular range or ranges being inspected will be completed and provided.

### Report:

- A report will be completed by the Risk Assessor for consideration of approval by the Commissioner's delegated Officer and should contain the following information:
  1. Application form as Appendix A of the Standards for Approval Manual
  2. Plans of the range.
  3. Photographs of the range.
  4. Plans of the locality.
  5. Copy of lease or other documentary evidence of occupancy.
  6. Letter of advice from the appropriate local authority regarding any objections if applicable.
  7. Copy of range orders.
  8. Copy of letter of authority regarding firing rights over private or government property.
  9. Range danger area template/s.
  10. Copy of public liability insurance policy or cover note for the range/club concerned.

### Approval:

The completed application and report is to be forwarded to:  
Police Licensing Services  
Ground Floor  
297 Hay Street, Perth WA 6000



# *Western Australia Police*

## *Firearms Ranges Standards For Approval*

VERSION 3/2008



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# Chapter 1 Introduction

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*These standards have been established after consultation with the major organisations responsible for the conduct of each type of shooting discipline in Western Australia. As a result, there are some variations in terminology which have been retained.*

## *Purpose of this document*

The aim of this document is to provide range owners with guidelines for designing, constructing, maintaining and inspecting ranges and paintball locations. These guidelines are pursuant to the requirement of Section 21(1) the Firearms Act 1973, that all ranges be approved by the Commissioner.

In order to give effect to these provisions, and having regard to the requirements of the Firearms Act 1973, this document contains basic specifications for the minimum standards for constructing ranges. Personnel using this information are to ensure that all calculations are accurate to ensure that safety is not compromised.

These range standards may be subject to amendment from time to time. Amendments will be supplied to clubs and organisations that are recorded as having an official copy of the standards.

*These guidelines are not designed to give the technical requirements of how to undertake the construction of a range; their purpose is to advise of the minimum safety standard required.*

## *Application considerations*

When considering an application, the Commissioner will particularly consider the proximity of:

- public roads,
- railways,
- paths,
- parks,
- buildings, and
- centres of habitation

flanking the sides of the range and within a direct unobstructed (excluding any backstop) distance. **This distance must be sufficient to cover the range danger area for the type of firearm and ammunition to be used on the range** unless other considerations such as baffles or hill dispensation effectively reduce the range danger area.

Further protective measures may be required if the Commissioner considers that the siting constitutes a danger to the public. These measures can be in addition to the minimum requirements set out in this document. The additional protective measures can be physical barriers, or special conditions for the use of the range. Section 21(1) of the Firearms Act 1973 permits the Commissioner to impose conditions on range approvals.

## *Provisional Range Inspection Report*

Prior to submitting an application for a planning permit to the relevant authority, documentation for a new range may be forwarded to a qualified Risk Assessor for comment and provisional inspection of the safety aspects. This provisional approval may also incorporate an inspection of the proposed range site. The provisional inspection report of the safety aspects may then form part of the supporting documentation for the Planning Permit Application.

Provisional approval is only an assessment of whether or not the location is able to meet the safety requirements for the type of range proposed. It does not take into consideration town planning, environmental or local government authority issues and should not be purported to be an endorsement for the range.

Final approval by the WA Police will be given for the range after construction, provided it complies with the original and provisionally approved design unless any modifications remain within the requirements of the Firearms Ranges – Standards for Approval manual.

## *Applications for approval*

### *What to send*

All applications must be accompanied by the following documents:

Application form (Appendix A);

Plans of range

When preparing your plans, you must include elevations, sections, specifications and details that adequately illustrate and describe the layout, construction and danger area (if any) of the range.

Your plans must be drawn to a scale (for example, 1cm to 1000 cm) and must be easy to read.

You must provide sufficient longitudinal and cross sections to the same scale. This information must indicate the heights, location and nature of devices (where applicable) designed to prevent escape of projectiles.

Where these devices are other than earth banks, you must also provide large-scale details and specifications of the materials and construction intended.

You must note the number of firing positions intended to be used on all ranges, and include a description of the ranges.

Photographs of range;

You must indicate the north, south, east, and west aspects on all photographs.

Plans of locality showing site;

Indicate on a locality map, for example a military map, the contour lines and the site of the range. The map must also show the surrounding area within a radius appropriate to the range danger area applicable to the range.

Copy of lease, or other, providing evidence of occupancy;

You must supply evidence of ownership, lease or authority for the use of the range site.

Letter from Shire/Council regarding non-objection. The letter must indicate that there are no objections to the site of the range so far as noise, nuisance or other issues ruled by Councils are concerned.

A copy of Range Orders;

A copy of public liability insurance policy;

A copy of the letter of authority, if firing rights over private or state owned property is involved.

Range danger area template/s (Not required for indoor or fully baffled outdoor ranges)

### *Where to send it*

Applications for approval of a range are to be sent to:

***The Manager***

***Police Licensing Services***

***297 Hay Street***

***Perth 6000***

## Chapter 2 Range orders

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### *Purpose*

Range Orders must be prepared and displayed at appropriate locations on the range. to ensure that:

- All necessary precautions are taken to prevent accidents, either to those using the range or to the public;
- Maximum use is made of the range space available;
- Guidance is given as to the extent of amenities provided.

Range Orders stipulate how, when, why and who should use the facility. They are policy and procedure statements relating to the use of the range.

Adequate Range Orders may prevent or minimise the opportunity for civil litigation against range operators or users. **They should form part of the education and enforcement processes that clubs should use to self regulate to ensure the longevity of their range.**

Education of range users is imperative. Clubs should develop a user education program on the premise that few users know how to use a shooting range properly. No exceptions should be made on pre-assumptions of a persons knowledge or ability.

Range design, rules, regulations, and personnel control all lack the ability to achieve their purpose in safety without adequate enforcement procedures. Consequences for violations must be clear and followed through when violations occur.

### *What to include*

The following is a guide for clubs when preparing Range Orders.

The document should be written on the sponsoring organisation letterhead or official stationary.

The document should indicate the date of adoption. Subsequent revisions should be noted and included in a report of when, why and by whom modifications have been made and approved.

Any revisions should state specifically:

- That they replace any previously adopted Range Order segments, and
- That previously distributed copies should be destroyed.

A review date should be established, perhaps once a year, to determine if the Range Orders are working and remain relevant.

The document should include a preamble stating a specific purpose, eg “These Range Orders have been established to ensure the health and safety of those individuals who use or frequent this facility and the community at large.”

Where applicable there should be a terminology section to clearly define terms that may be loosely interpreted e.g. “rifle” could be interpreted as centrefire, black powder when it is intended to be rimfire.

The Range Orders should divide rules and regulations into categories such as;

- Section 1 Firearms Handling Rules,
- Section 2 General Range Rules,
- Section 3 Specific Range Rules (according to the type of range) and
- Section 4 Administrated Rules and Regulations

Any exceptions to the rules and regulations should be carefully defined to avoid confusion

A conclusion of the Range Orders should outline the consequences or action that will apply for any breach of the Range Orders.

**Section 1 Firearms Handling Rules** could incorporate, where applicable, but not be limited to the following;

- Always Keep The Firearm Pointed In A Safe Direction
- Always Keep Your Finger Off The Trigger Until Ready To Shoot
- Always Keep The Action Open And The Firearm Unloaded Until Ready To Use
- Know Your Target And What Is Beyond
- Know How To Use The Firearm Safely
- Use Only The Correct Ammunition For Your Firearm
- Wear Ear And Eye Protection
- Never Use Alcohol Or Drugs Before Shooting
- Store Firearms So They Are Not Accessible To Unauthorised Persons

**Section 2 General Range Rules** could incorporate, where applicable, but not be limited to the following;

- Know And Obey All Range Commands
- Know Where Others Are At All Times
- Shoot Only Authorised Targets
- Designate A Range Officer When None Is Present Or Assigned
- Unload, Open The Action, Remove The Magazine And Ground/Bench All Firearms During A Ceasefire
- Do Not Handle Any Firearm Or Stand At The Firing Line Where Firearms Are Present While Others Are Down Range
- Always Keep The Muzzle Pointed In A Safe Direction. Never Allow The Muzzle To Point In An Direction Whereby An Inadvertent Discharge Would Allow The Escape Of A Projectile Form The Range

**Section 3 Specific Range Rules** must be developed for each range facility and shooting activity and could incorporate, where applicable, but not be limited to the following;

- any rules restricting
  - type of firearms
  - shooting activity type
  - calibre or shot size
  - type of projectiles
  - target type
  - shooting distance permitted
  - shooting stances permitted
  - limitations to arcs of fire
- adjacent ranges and forward movement

- establish administrative regulations regarding target frame materials, security and equipment usage, along with buildings and ground maintenance as necessary for the safe and efficient range operation
- range commands, their purpose and actions to be taken eg
  - Command: “CEASE FIRE”
  - Purpose: To stop all shooting routinely or in case of emergency, immediately
  - Action: Participants immediately stop shooting, continue to keep the muzzle pointed down range, remove finger from within the trigger guard, unload and clear the firearm, await further instructions from the range officer.

**Section 4 Administrated Rules and Regulations** could incorporate, where applicable, but not be limited to the following;

- range schedules
- parking
- guest policies
- member and user responsibilities
- hours of operation
- security
- range supervision
- alcohol
- emergency contact numbers
- emergency procedures
- location of first aid kit
- location of fire fighting equipment
- local government authority requirements or restrictions
- designated safe area
- any special night firing procedures
- spectator areas
- display of warning flags

## *Chapter 3 Range danger areas*

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The provisions of Section 20 of the Firearms Act 1973 require that “a shooter must have the consent of the land owner before he shoots onto or across private property.”

Where an outdoor range is engineered in a manner that fails to eliminate the chance of bullet escapement outside of the property owned or controlled by the club, organisation or range operator a range danger area (fallout/safety zone) is to be applied to the range.

The club, organisation or range operator must have authority (firing rights) to shoot onto or across all land, including roads that fall within the range danger area. If the authority to shoot over the property can not be obtained then suitable range enhancements must be put in place to restrict escaping bullets to the land that they have authority over.

The following chapter may be difficult for a novice to understand. However, if care is taken and the steps followed carefully then the correct result can be achieved.

The chapter is based upon the Australian Department of Defence procedures for establishing range danger areas. If followed correctly, the procedures will provide a range danger area that will be defensible if the need arises.

### *Description*

A range danger area includes those areas of land or water, together with a specified air space, within which danger to life, limb or property may be expected to occur arising from the use of specified ammunition.

The distance a projectile will travel varies according to several factors: ballistic coefficient, projectile weight, muzzle velocity, calibre, projectile shape, angle of elevation, wind speed, wind direction, relative humidity, and height above sea level.

Examples of more common projectile maximum distances are provided throughout this manual for the information of range operators or users. Computer ballistic programs and mathematical formulas are available that will provide information for the less common projectiles or variations in the specifications of examples provided in this manual.

As shown in the following diagram the range danger area consists of the following:

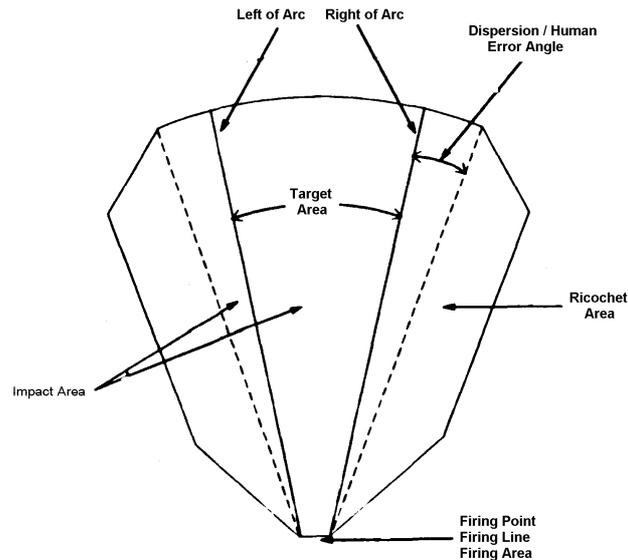
- **Firing Point**

The firing point is the position from which the firing occurs. It may take the form of a point for an individual firearm, a line for a number of firearms or an area for one or more firearms firing from different positions.

- **Impact Area**

An impact area is a designated area where all ammunition is to make contact with the ground. An impact area consists of the:

- ◇ **target area**, which is the point or location at which fire from the firearm is directed;
- ◇ **dispersion/human error angle**, which delineates an area on both sides of the line of fire to cover eventualities such as human error, for example unsteady aim or the effects of meteorological conditions;
- ◇ **ricochet area**, which is the area in which ricochets of ammunition may expect to travel.



## Definitions

The following definitions apply to range danger areas.

- **Angle of elevation**

The angle of elevation is the angle between the horizontal plane and the axis of the firearm barrel.

- **Angle of depression**

The angle of depression is the angle between the horizontal plane and the axis of the firearm barrel when it is depressed below the horizontal plane.

- **Arc of fire**

The arc of fire is that area within which firing is to be directed. It is to be indicated from the firing point or area.

- **Culminating point**

The culminating point is the highest point to which the projectile will rise above the line of sight along the trajectory.

- **Ammunition Danger Area template**

An Ammunition Danger Area template is a scaled drawing of the area of danger created when a single round of ammunition is fired from a static position along a single line of fire.

Every combination of firearm and ammunition has a distinct Ammunition Danger Area template. You must combine your knowledge of the firearms and ammunition with a high degree of range discipline when creating the template.

The dimensions of a Danger Area template are based on a combination of:

- ◇ the degree of accuracy of the firearm;
- ◇ the type of ammunition, propellant and charge;
- ◇ an accepted degree of human error; and
- ◇ the ground and conditions of firing.

- **High elevation fire**

High elevation fire occurs when high mounted targets are used. High elevation fire templates are to be applied wherever the firing elevation is more than 200 mils/11 degrees but less than 1,250 mils/70 degrees, from the horizontal plane.

- **QE**

The QE is the angle of elevation, measured from the horizontal plane, at which a projectile is launched from a firearm barrel.

- **Range danger area template**

The range danger area template is a diagram constructed by range users. It defines, on a map of the same scale, the limits of the dangerous area created when an ammunition danger area template is applied from all firing points to all target positions.

It is used by:

- ◇ range users, to determine the maximum permissible arcs of fire;
- ◇ range authorities, to determine whether the activity can be conducted safely and within the confines of the range boundaries; and
- ◇ clubs and organisations, to determine the requirement for things such as closure of access or warning of local inhabitants.

- **Soft target**

A soft target area exists where there are no hard crystalline rock, concrete or metal objects in the impact area which could cause an increase in ricochet risk.

When constructing a range danger area template, where the target is not on the axis of the range, add the angle to the dispersion angle.

### *Designing templates*

You will require a thorough understanding of ammunition danger area templates before you can construct a range danger area template.

Organisations that have multiple ranges can nominate one person to prepare the template. It can then be passed to each affiliated club to include in their application. In such cases it is important that each club ensures that the map they use is to the same scale as the template.

Ammunition planning factors that affect template design are specified in the table on page 3–10, and include:

- maximum ranges;
- dispersion, human error angles;
- ricochet angles;
- ricochet distances;
- angle of elevation for high elevation fire; and
- air danger heights.

The factors that must be taken into account when designing an Ammunition Danger Area template are:

- ricochet characteristics;
- danger heights;
- high elevation fire; and
- excessive wind.

### *Ricochet characteristics*

When determining the dimensions of a template, you must consider the following ricochet factors that affect the final design.

- A ricochet occurs when a projectile strikes a surface then rebounds one or more times.
- If a projectile strikes at an angle of less than 530 mils/30 degrees to the surface and does not explode or disintegrate, it may ricochet at an angle of up to 800 mils/45 degrees in any direction from the line of fire.
- The range at which a projectile achieves an angle of descent of 530 mils/30 degrees is taken as its maximum ricochet range. The firearm elevation which achieves this range is taken as that elevation above which ricochets will not occur.
- A projectile which strikes short of its maximum ricochet range can skip on up to the maximum range of the firearm.
- The angle to which a projectile will ricochet laterally depends on the type of surface struck. The lateral ricochet distance for hard and soft targets' surfaces is the same in most instances, because of the loss of kinetic energy after deflection.

### *Danger heights*

Templates are concerned not only with danger areas at ground level, but also with danger heights. Although ammunition may only reach peak heights in certain, very small portions of the overall area, the danger height is still applied over the whole template area.

### *High elevation fire*

The elevation at which high elevation is said to occur varies from one ammunition to another. In general terms, it is at that particular angle above which a ricochet is not expected under normal circumstances. The danger area for high elevation fire is no longer than the normal danger area.

The high elevation template is **not** to be applied where firing is to take place below the angle specified in the Ammunition Planning Factors table on page 3–10.

### *Excessive wind*

The danger area template makes provision for a wind velocity of up to 50km/h. Where high elevation firing practices are proposed in wind conditions in excess of 50km/h, the danger periphery on the downwind side must be extended by at least 500 metres.

**Where, in such circumstances the danger area would extend outside the range boundary, firing is not to be permitted.**

### *Constructing Ammunition Danger Area templates*

Before commencing the construction of an Ammunition Danger Area template, you must determine the:

- ammunition type to be fired;
- scale of map to be used (to determine scale of construction);
- angle of elevation, firer to target, field firing area (FFA) or high elevation fire (HEF) templates for the relevant ammunition, or a combination of both may be required;
- type of surface in the target area (hard or soft).

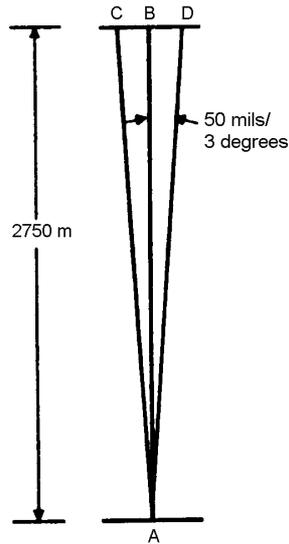
Follow the steps below when constructing a danger area template. The example given is based on a danger area generated when using 5.56mm ammunition at a QE of less than 200mils/11 degrees. **The drawings are not to scale.**

#### **Line of fires**

1. Draw a single centre-line which indicates the line of fire.
2. Measure a distance, to scale, of 2,750 metres (the low elevation maximum range for 5.56mm ammunition) from the firing point (point A), along the line of fire (point B).

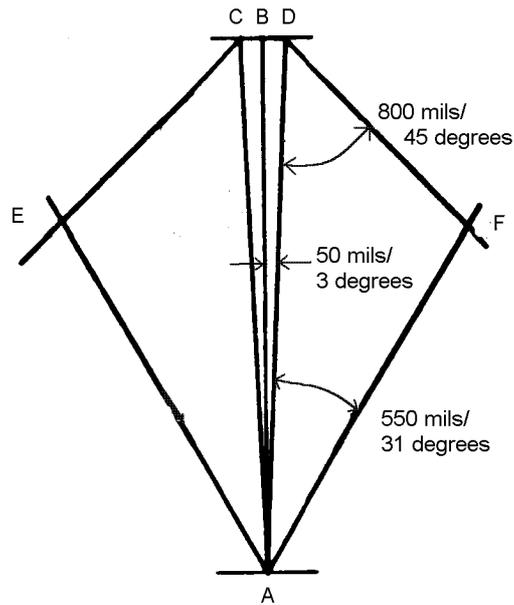
#### Dispersion/Human error angle

1. Draw a line of any length, at 1,600 mils/90 degrees to the line of fire, at point B.
2. Starting from point A and on each side of the line of fire, draw lines AC and AD at an angle of 50 mils/3 degrees to AB (the applicable dispersion/human error angle).



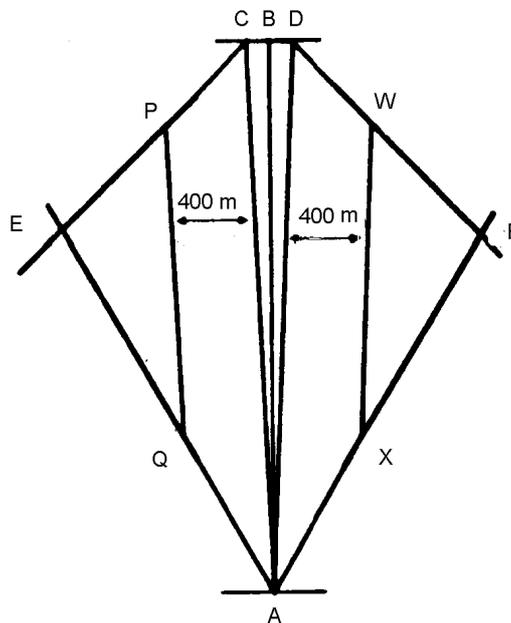
#### Ricochet angles

1. Draw a line from point A, at an angle of 550 mils/31 degrees (the applicable ricochet angle) from AD (the dispersion/human error line, NOT THE LINE OF FIRE).
2. Similarly, draw at an angle of 550mils/31 degrees from AC.
3. Draw lines back at an angle of 800mils/45 degrees (the maximum angle at which a round may ricochet) from points C and D, to meet the other two lines at E and F respectively.



**Ricochet boundaries**

1. Draw a line WX parallel to AD and at a scale distance of 400 metres (the maximum ricochet distance) from AD.
2. Similarly draw a line PQ parallel to AC.

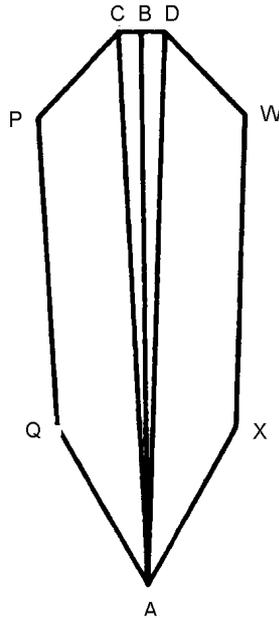


• **Confirmation**

Confirm that all angles and scale distances are correct.

• **Completed template**

1. Erase all construction lines to leave the seven sided shape AQPCBDWXA.
2. Inscribe all relevant information onto the completed template.



### *Transferring templates*

When you have verified the accuracy of the template, transfer it to rigid transparent film. To do this:

1. Place the film over the completed template, firmly securing it in place.
2. Use the point of a sharp metal instrument to trace the shape onto the film.

Use a straight edge when tracing lines.

3. Lightly etch in the line of fire.

It is not necessary to show the dispersion/human error angle, as this is no longer required once the danger area shape has been determined.

4. Remove the film and cut the template out of the full sheet.
5. Check the accuracy of the completed template against the construction drawing.

### *Annotating templates*

Annotate all completed danger area templates with the:

- calibre of ammunition used;
- nature of ammunition (for example, factory load, hand load);
- scale of the template;
- firing point (to avoid the template being incorrectly applied);
- owner's name;
- quadrant elevation, where applicable; and
- nature of the target (hard/soft).

### *Applications of range danger area templates*

You can use the basic danger area template to construct a range danger area template for ammunition fired by:

- a single firearm or a number of firearms, from a static firing point, or line, to targets located within a defined arc of fire;

- any number of firearms from a firing area which allows firearms to move and engage targets located within an identifiable target area.

### *Factors affecting the application of templates*

When using danger area templates, the principal limiting factor will normally be availability of a large enough area. You can obtain full advantage of the area only by skilfully applying the correct danger area template. The four main issues that you must consider are:

- type of ammunition and firearm;
- ricochet dimensions to be applied;
- whether a standard (FFA) template, HEF template, or a combination, are to be used;
- the type of firing position, that is static or moving.

Range danger templates are not only concerned with danger areas at ground level, but also with danger heights. Although ammunition may only reach peak heights in certain very small portions of the overall area, the danger height is still applied over the whole trace area.

### *Applying templates*

#### *Application of templates for Static Firing Point - Multiple Targets*

To determine the overall size of the range danger template:

1. Apply the point of the appropriate danger area template to the firing point located on the map.
2. Swing the template as far left and right as the factors, (referred to in *Factors affecting the application of templates* on page 3–8) allow.

The centre-line of the template now indicates the maximum left and right of arc for that range danger area template.

#### *Application of template for moving target*

The construction of a range danger area template involving moving targets is based on the same principles as for static firing. The appropriate template must be applied from the firer's position to the extremities of the target run, thereby obtaining the required arcs of fire.

### *Submitting range danger area templates*

Once the overall range danger area template has been determined, submit it to the Firearms Inquiry Unit, with all other documentation.

To be approved the template must have:

- at least three grid intersection points which correlate to the map it is to be used on;
- the eight figure grid references of the firing point, line or area;
- the grid bearings marked on the left and right of arc of fire, in accordance with the initial plotting done from the map;
- reference to the map used and its scale;
- author's name and date of construction;
- the ammunition involved;
- the QE permitted; and
- the ricochet area used.

## *Range danger area reduction*

### *Hill background dispensation*

A steep hill immediately behind the target area may be grounds for a reduction in the range danger area if:

- the ground rises immediately behind the target area, at a mean slope of greater than 550 mils/31 degrees above the mean line of sight, to the height of 100 metres. If this occurs, the danger area can be reduced to the 100 metres height line.

or:

- the ground rises immediately behind the target, at a mean slope of greater than 1,060 mils/60 degrees above the mean line of sight, to a height of 45 metres. If this occurs, the danger area can be reduced to the 45 metres height line.

The effectiveness of any hill background, which might offer grounds for the possible reduction of a range danger area, depends on the availability of a properly profiled stop butt or bullet catcher, maintained to the prescribed standard.

The adequacy of a hill background as a natural stop butt depends upon the nature of the ground, its slope and distance behind the target line and its height above the line of sight.

### *Range Enhancements & Management*

Range enhancements, management and shooter education may allow for a reduction the range danger area.

Range enhancements on outdoor ranges may include:

- Backstops
- Sideberms
- Sidewalls
- Baffles, including
  - Awning baffles
  - Ground baffles
  - Side baffles
  - Overhead baffles
    - Vertical
    - Angled
  - Transportable baffles
  - Adjustable baffles
  - Tube baffles
- Target placement
- Bullet trap canopies/eyebrows
- Sloping the floor of the range
- Ricochet pits

Management issues for the range should be reflected in the Range Orders and may include defining:

- the type of firearms

- the type of ammunition
- the maximum muzzle velocities
- the type of shooting activities
- the shooting positions
- target placement
- numbers of targets
- types of targets

### ***Firing rights over private property***

The requirements on a range operator under the provisions of Section 23(10) of the Firearms Act require that the consent of the owner of private property must be given before shooting can take place onto or across the private property that falls within the range danger area.

Western Australia Police will accept evidence of firing right either by:

- Written consent in the form of a legal contract or letter of consent that identifies the landowner and the property he/she is giving consent over, or
- Verbal consent. If this option is used then the name, address and contact telephone number must be provided to Western Australia Police for verification of the arrangement.

### **The onus on obtaining and retaining firing rights over any property in the range danger area rests with the range operator.**

Failure to ensure that all firing rights are current whenever the range is in use may result in exposure to

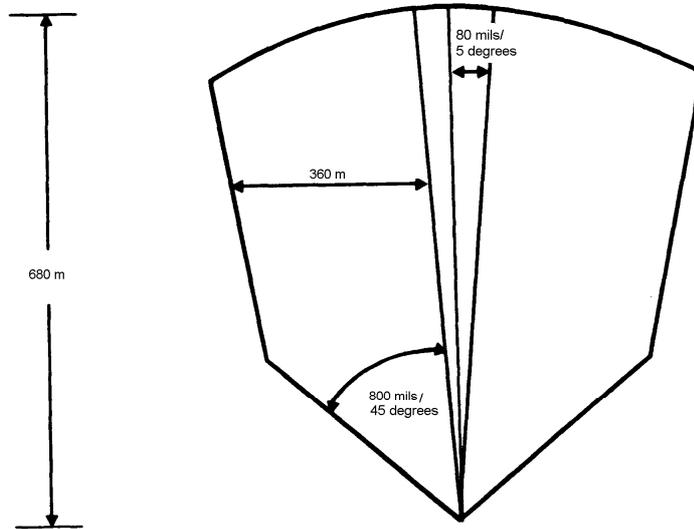
- criminal and civil litigation for the range operator or persons using the range, and
- cancellation of the range approval

*Ammunition planning factors*

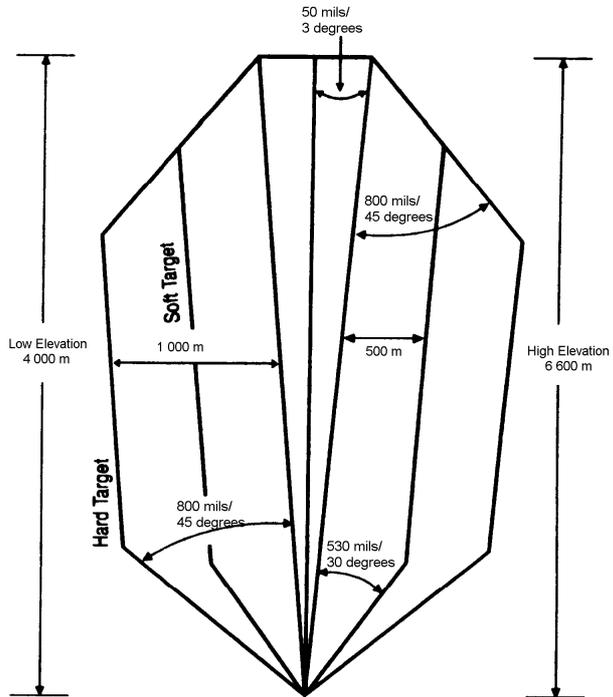
Round/Projectile	Maximum Ranges (m)		Angles mls/degrees			Ricochet Distance (m)	Air Danger Height (m)
	Low Elevation Fire (FFA)	High Elevation Fire (HEF)	Dispersion Human Error Angle (mls/degrees)	Ricochet Angle (mls/ degrees)	QE above which Ricochet is not expected (IE HEF)		
<b>.22 6.5mm</b>	1300m	1550m	50 mls/3 degrees	550 mls/31 degrees	220 mls/12 degrees	80m	500m
<b>9mm</b>	1500m	1825m	50 mls/3 degrees	550 mls/31 degrees	220 mls/12 degrees	200m	900m
<b>7.62mm .303 .30 5.56mm</b>	2750m	4000m	50 mls/3 degrees	550mls/31 degrees	200 mls/11 degrees	400m	1000m
<b>9mm .45 inch</b>	1500m	1825m	50 mls/3 degrees	550 mls/31 degrees	220 mls/12 degrees	200m	900m
<b>.50 Target Rifle</b>	4000m	6600m	59 mls/4 degrees	530 mls/30 degrees	270 mls/15 degrees	500m	530m
<b>12 gauge Solid Shot</b>	680m	-	80 mls/5 deg.	800 mls/45 deg	-	360m	1800m
<b>SG</b>	580m	-	80 mls/5 deg.	200 mls/11 deg	-	-	1525m
<b>No.6</b>	280m	-	80 mls/5 deg.	320 mls/18 deg.	-	-	750m
<b>No.2</b>	380m	-	80 mls/5 deg.	260 mls/15 deg.	-	-	1000m

*Examples of ammunition range danger area templates*

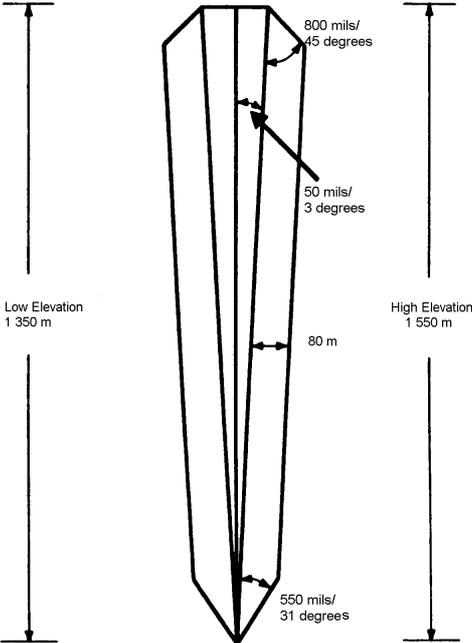
*12 Gauge, Solid Shot*



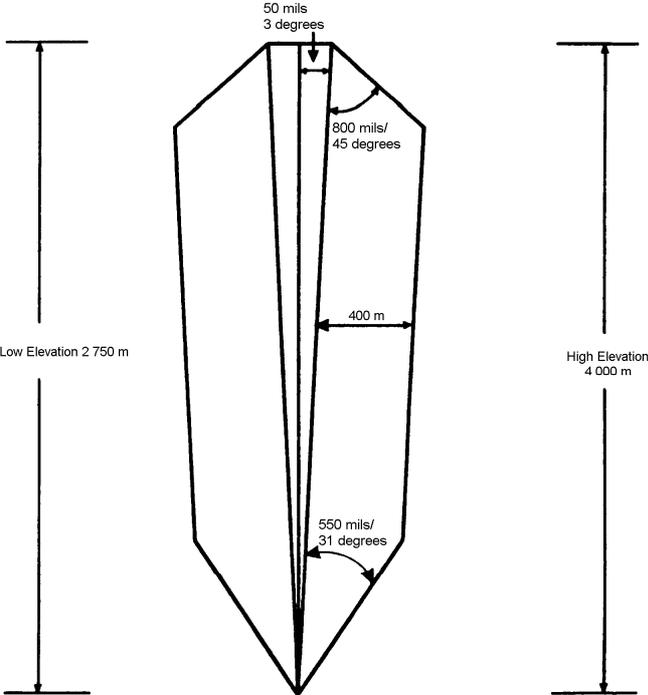
*.50 Calibre Target Rifle*



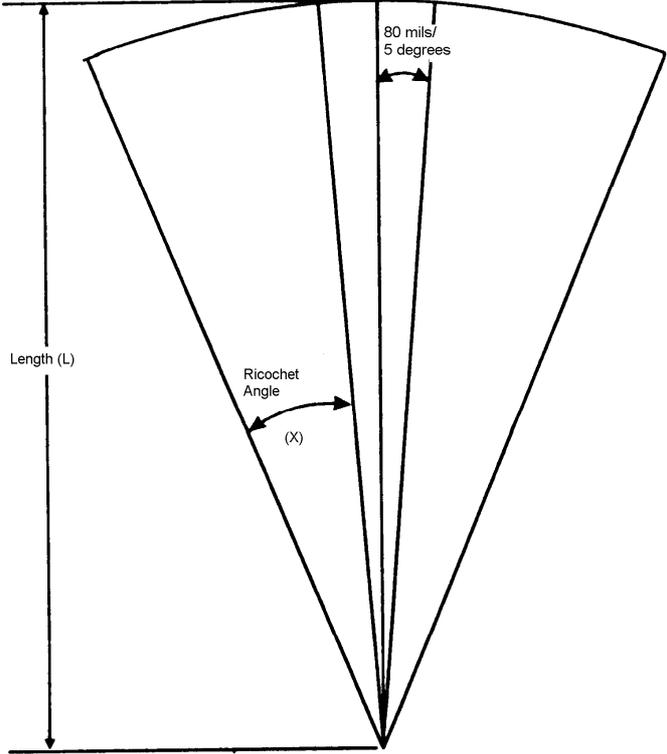
*.22 inch and 6.5mm Gallery template*



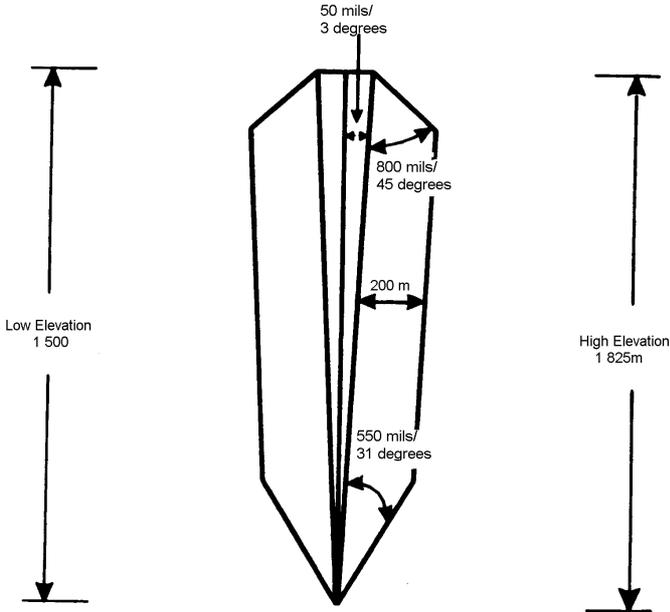
*7.62mm/303 inch/5.56mm*



12 Gauge Pelleted Ammunition



9mm



## *Chapter 4 Inspection procedures*

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### *Purpose*

The purpose of the inspection is to ensure that the range/paintball activity location complies with the minimum requirements of this manual to obtain the approval of the Commissioner under the provisions of Section 20(1) of the Firearms Act 1973.

### *Inspection*

In this instance the Risk Assessor will consider each firing range/paintball activity location contained within a shooting venue is to be a separate inspection. The criteria for use will be based on the type of firearms, the type of ammunition, the calibre of ammunition and the type of shooting disciplines.

Each range/paintball activity location will be evaluated to examine the needs of the shooter in relation to the types of shooting that will take place and to ensure that the range/paintball activity location has been specifically engineered to accommodate the chosen shooting activities. Shooting ranges are designed for specific purposes and the type of activities conducted on them should never exceed the design capabilities

No range is completely safe. The degree of safety achieved depends on many factors, including:

- The design factors
- The accuracy of construction
- The current condition, dependent upon the recurring standard of maintenance
- The skill of the range users, and
- The standard of range discipline

Inspection of the range/paintball activity location will also include:

- Assessment of education programs, including Range Orders, for those that use the facility, and
- The enforcement procedures that are in place that:
  - Identify the consequences for violations, and
  - Ensure follow-through when violations occur.

It is recommended ranges/paintball locations should be subject to regular inspections by a Risk Assessor to ensure continued compliance in line with the original approval by the WA Police. These inspections do not negate the need for regular inspection by the range operator or club to ensure it continues to comply with the requirements of this manual

Regular inspection should be conducted with a representative of the range operator or club. The inspections will ensure that the range meets the Firearm Ranges – *Standards for Approval*, specifications endorsed by the Commissioner of Police.

The onus of responsibility rests with the ranger operator or club to maintain continued compliance.

### *New ranges*

If a new range/paintball activity location complies with Commissioner's standards, a letter of approval will be issued. This letter of approval will have a schedule of any conditions attached to the approval of the range.

### *Established ranges*

Subject to a Risk Assessors report being received concerning an existing range/paintball activity location continuing to comply with the required standard a letter acknowledging this fact will be issued. This letter of approval will have a schedule of any conditions attached to the approval of the range/paintball activity location.

If an existing range/paintball activity location fails to comply with the Firearm Ranges – *Standards for Approval*, an inspection report is to be provided to the Manager – Police Licensing Services by the range operator/club.

If the fault is not a major breach of safety, a time period for rectifying the fault will be given and then a further inspection conducted. Approval of the range/paintball activity location will be granted after the fault has been rectified.

**NOTE: Approval for part or all of the range/paintball activity location may be immediately withdrawn if a major breach of the safety standards occurs. This will depend on the nature of the fault.**

### *Accident free records*

Western Australia Police will acknowledge the apparent previous safe history of ranges however accident free records will not be accepted unquestionably when conducting the inspection of any range nor will the apparent safe history reduce the requirement for the range to comply with the current range standards. The reasons for this are:

- over long periods of time, that records of events, which were considered serious at the time, have been lost sight of,
- events may never have been properly recorded,
- events may never have been reported by those responsible, and
- the areas of land within the range danger area are not subject to intense or continual observation and should be unoccupied during firing, so no one knows how many rounds may have fallen unseen.

### *Alterations or additions to ranges/paintball activity location*

Prior to commencing range alterations or additions that affect any part of the range danger area (as described in Chapter 3) a Risk Assessors report must be submitted with detailed plans of the proposed alterations or additions. This does not include alterations to buildings or other facilities such as club houses unless they form part of or affect the range danger area. The alterations or additions will be subjected to a final Risk Assessors report inspection **before** being approved for use.

Alterations or additions to ranges/paintball activity locations that are not approved could invalidate the original approval.

### *Inspection reports*

The Risk Assessor may include the following information in the Inspection Report:

- the location and type of range/paintball activity location;
- the name and location of the range/paintball activity location;
- the name of the club/organisation controlling the range/paintball activity location;
- the type of range (for example, pistol, clay target, fullbore rifles);
- the range details (where applicable);
  - ◇ the length of the range in metres (measured from the firing point to the furthest target);
  - ◇ the type of firearms, calibres and firing disciplines to be used;
  - ◇ the number and type of target frames;
  - ◇ a brief description of the general nature of the soil in the range area (for example, loam, shale, rock);
  - ◇ the formation of firing points (for example, firing posts and benches);
  - ◇ the security fencing/gates;
  - ◇ the warning signs;
  - ◇ the warning flags;
  - ◇ the stop butts;
  - ◇ the side-wings;
  - ◇ the sidewalls/berms;
  - ◇ details (to be shown on map) of existing arrangements to prevent people entering the danger area when firing is in progress. (For example, physical barriers and flag poles);
  - ◇ the red lights (if night shooting);
  - ◇ the firing rights onto adjacent land;
  - ◇ the range danger area (for example, roads and houses).

### *Alterations to range approval letters.*

The Commissioner will issue range approval certificates with conditions imposed according to the type of shooting activity to be permitted on the range after the completion of the inspection processes.

If a club or range operator later advises that alterations to the schedule of conditions attached to any range approval certificate are desired the range will be subject to a further inspection to:

- ensure that the desired changes are compatible with the original design of the range or
- that appropriate modifications have been made that will permit the desired activity.

A new range approval certificate and schedule of conditions will be issued if the range meets approval requirements.

Unless significant safety issues are identified the Commissioner will not alter range approvals without prior consultation with the club or range operator.

***Review of non-approval of shooting range/paintball activity location***

Section 22(2) of the Firearms Act allows for a non-prohibited person who has applied to the Commissioner for approval of a firearms shooting range/paintball activity location to apply to the State Administrative Tribunal for a review of a decision of the Commissioner not to approve the shooting range/paintball activity location.

## *Chapter 8 Outdoor pistol ranges*

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Certain basic considerations are used to lay out outdoor ranges. They are:

- terrain features
- site dimensions
- type of range
- fallout requirements
- soil structure
- surrounding inhabitants
- access
- utilities

Outdoor ranges are required to conform to the following specifications:

- An area large enough to accommodate the appropriate range danger area and dependent upon existing or modified topographic features;

In flat country the entire area required for a specific range danger area would be needed, but in mountainous and heavily treed areas the space requirements may be different.

- The range should be located as far away as possible from populated areas;
- The range danger area should be free of buildings, stocks, crops, roads and footpaths;

Appropriate insurance shall be carried by the club or land owner if stock, crops or buildings are present in the range danger area.

- The ground between the targets and firing line must be free of any hardened surface such as rocks or other ricochet producing materials;

This does not include materials that make up any part of the target system, pathways or additional firing points. The edges of all concrete or metal structures forward of any firing line must be shielded with materials (such as wood) to reduce ricochet, or with steel, to deflect projectiles in a safe direction.

### *Use of range by outside organisations*

If the range is used by outside organisations for official or commercial training, both the club and outside organisation must be aware of the potential for increases in the size of the range danger area if ammunition other than normal competition ammunition is used or non-regulation competition shooting takes place.

### *Design requirements*

#### *Firing point positions*

The firing line (or firing line cover) must be constructed so that there is no possibility of inadvertent access either to, or forward of, the firing line.

The firing point positions should be hard-surfaced. Surface material should be concrete, however gravel, wood or grass are acceptable alternatives. At ranges with multiple firing lines, hard surfaced areas located forward of another firing line must be recessed or shielded from bullet impact to avoid ricochets off exposed edges.

A firing line cover may be made from any basic construction material in accordance with local authority requirements. To further reduce noise transmission, use appropriate insulation in the construction of the cover, or add it to the cover.

### *Backstops/Butts*

Backstops may be a natural hill or man-made earthworks. They must be free of rocks and debris to a minimum depth of 46 cm. Core material may be used, and then covered with 46 cm of clean soil maintained to that depth. Advice must be sought for the approval of man-made backstop materials other than earth. Tyres are not acceptable.

#### **All surface areas where bullets may strike must be rock-free soil.**

The crest (top) of the backstop/butt must be at least:

- 5 metres above the firing point level, for new ranges to allow for settlement;
- 4 metres above the firing point level, for existing ranges.

All backstops must be maintained at their approved height.

The length of the backstop/butt will depend on the number of targets used. However, the distance from the outside edges of the flank (outside) targets to the end of the crest line must be at least 4 metres.

The crest of the backstop/butt must be level and at least 1.5 metres thick. The thickness of the base is dependent on the type of soil used.

The face of the backstop must have a minimum angle of 35 degrees facing the shooter to reduce the potential for ricochet.

The bank face of a natural stop butt may be used, however the requirement to carry out de-leading, constant firing and weathering, will eventually cause the lower portions to collapse and seek a natural angle of repose below 35 degrees thereby rendering the bank unsuitable.

Tandem butts may be used to take advantage of rising ground but care must be taken to sight both of them in the 15 to 30 metres distance from the targets and also avoid the crest of the closest butt from receiving the main concentration of bullet strikes.

Terraced Hill Butts using bulldozer or tilt blade graders are permitted. Each cut must be deepest at the further distance from the target so that the correct slope of not less than 1 metre vertical and 600mm horizontal is maintained.

### *Wingwalls (where required)*

The backstop/butt must be flanked with a 'wingwall' constructed the same as the backstop/butt. The wingwall must be at an angle of between 10-30 degrees from the front of the crest edge of the backstop/butt. The length of the 'wingwall' must be at least 4.5 metres.

### *Side berms/Walls*

Side berms or walls may be required. This will depend on topography, environment, type of shooting and danger areas.

- If there are adjacent ranges, the height of the berms must be at least 2.2 metres at the firing point;
- The surface areas must be free of rock and debris to a depth of at least 30 cms;
- They may be constructed from timber. Unseasoned timber is not recommended as it is subjected to shrinkage, causing gaps to appear between the timbers. The timber must be thick enough to prevent pellets passing through it.
- Range walls must not be used as bullet catchers or backstops unless they have been engineered for that purpose.

### *Baffles*

Baffles are used to contain the flight of bullets to a specified area within the range. They are required in areas where space is inadequate to provide the required range danger area.

They may be constructed from a variety of materials, however wood and metal are the most common. It is recommended that metal is sandwiched between two layers of wood. The off-side of the baffle panel is then covered with a layer of wood to reduce sound generated by projectile strikes.

Overhead baffles must extend the entire width of the firing line and connect to either a sidewall or berm. Any proposed baffling will be subject to testing to establish its effectiveness.

Baffles should be made of a suitable material to prevent penetration by a projectile. They should be used to protect lighting, ventilation and any other fixtures forward of the firing line that are likely to be damaged or cause a ricochet.

### *Target frames*

Target frames are by their very nature liable to be damaged by projectiles. To reduce the risk of ricochet or backsplash from the target frames they should be made of penetrable material or defended by wood or similar material.

### *Target Placement*

Placement of targets is limited by the requirement to ensure that the line of sight from the muzzle through the centre of the target is contained by the bullet catcher or backstop.

### *Range floor*

The ground between the firing line and the bullet catcher/stop butt must be free from hard surfaces, extraneous rocks or outcroppings or any other ricochet inducing material.

If the intervening land is very hard, the likelihood of ricochets occurring from accidental discharges may be reduced by incorporating ricochet pits or ground baffles forward of the firing positions.

### *Identification of outdoor pistol ranges*

When shooting is in progress the range must be clearly identifiable to warn and advise a person that they are moving into a danger area. Identification must consist of:

- adequate, maintained fencing on all range land boundaries to prevent easy access;
- signs, with red or red and black lettering on a white background, properly sign-written with the words 'Pistol Range - Danger, Keep Out' (or similar). If the range is approved for multiple types of firearms, the words "Firearms Range - Danger, Keep Out" (or similar) may be used. These signs must be fixed to the fencing at 25 metre intervals, facing the public and at all points of access;
- red warning flags on poles that are visible from all likely approaches. The poles must be erected at the entrance to each shooting area and at the extreme end of any backstop/butt which may be accessible to the public.
- red warning flags must not be left flying after firing has ceased for the day.

All flags must be replaced by red lights when night-time shooting is in progress.

### *Maintenance*

Keep the following in mind when considering the maintenance of shooting ranges:

*The design and construction of ranges creates conditions up to the target line which reduces the ricochet hazard to a minimum. It is therefore important that ranges are regularly and thoroughly maintained. Deterioration of the firing points and stop butt,*

*including a build up of lead or by the formation of bullet scoops, will increase the chance of ricochet and in extreme cases may result in the closure of the range or restriction in its use.*

Ranges used for firing practice week after week will require proper maintenance. It is recommended that a maintenance day be set aside, on a weekly or monthly basis, or as required, to take care of additions and repairs. Annual maintenance periods should be planned to carry out major works, such as de-leading stop butts.

### ***Maximum ranges for rimfire & centrefire pistols***

The maximum range tables are mean as a guide for range operators when determining the range danger area template of the range. Variations may occur to maximum ranges

<b>Calculated maximum ranges</b>			
<b>Bullet Calibre/name</b>	<b>Bullet weight (grams) &amp; type</b>	<b>Assumed MV (fps)</b>	<b>Calculated max. range (yards / metres)</b>
<b>.22 LR HV</b>	37 Lead	1255	1895 yds/1732 m
<b>.22 Long Rifle</b>	40 Lead	1150	1922 yds/1757 m
<b>.32 S&amp;W Long</b>	98 Lead	705	1213 yds/1109 m
<b>9mm</b>	115 FMC	1155	1907 yds/1743 m
<b>9mm</b>	124 FMJ	1120	1935 yds/1769 m
<b>9mm</b>	147 HP	1010	2288 yds/2092 m
<b>.38 Special</b>	110 JHP	995	1908 yds/1744 m
<b>.38 Special</b>	148 WC	710	747 yds/683 m
<b>.38 Special</b>	158 LHP	890	1797 yds/1643 m
<b>.357 Magnum</b>	158 JSP	1235	2004 yds/1832 m
<b>40 S&amp;W</b>	150 JHP	1140	1736 yds/1587 m
<b>40 S&amp;W</b>	180 JHP	985	1940 yds/1773 m
<b>10mm</b>	150 JHP	1325	1743 yds/1593 m
<b>10mm</b>	180 JHP	1030	1969 yds/1800 m
<b>40 Mag</b>	180 JHP	1610	1849 yds/1690m
<b>44 Mag</b>	240 JHP	1180	2492 yds/2278 m
<b>45 ACP</b>	185 JHP	950	1914 yds/1750 m
<b>45 ACP</b>	230 FMJ	850	1624 yds/1489 m

## *Chapter 9 Indoor pistol ranges*

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### *Design requirements*

Indoor ranges are to be designed to ensure all rounds fired are confined within the range, and backslash and ricochet hazards to persons within the range are eliminated

### *Backstop/Backstop/Bullet trap*

The bullet trap must be designed to prevent ricochet and splash back towards the firing line. It should be of steel construction designed for constant use with the various calibres and types of projectiles that are proposed to be used on the range.

The end of the building used as a backstop must be rendered bullet proof from the floor to the ceiling and for a width of three metres clear of the flank lines of fire if the bullet trap does not extend to the full width of the building.

Where steel bullet traps are to be used the primary impact plates should be heat treated steel. The calibre and type of projectiles to be used on the range will determine the thickness of the steel plate e.g. a range to be used for .38 calibre and 9mm pistol should not be less than 10 mm in thickness with a hardness of not less than 400 Brinell and a tensile strength of 190 000 psi minimum.

Plates should be overlapped to protect leading edges towards the firing line. Plates should be fastened to a frame with special T bolts to eliminate bolts or hardware being exposed to direct hit. Where the bullet trap is to be a permanent structure the plates may be welded.

### *Sidewalls*

Sidewalls must be of a material suitable to prevent projectiles leaving the range or effectively baffled to eliminate the chance of a projectile striking the wall.

Walls should be finished smooth and all joints should be flush. Where this is not possible large surface protrusions should be removed or defended against direct fire, backslash or ricochet.

Range walls must not be used as bullet catchers or backstops unless they have been engineered for that purpose.

### *Roof*

The roof must be of a material suitable to prevent projectiles leaving the range or baffled.

### *Baffles*

If installed, sidewall or roof baffles must be able to prevent projectiles penetrating the sidewall or roof. Where steel baffles are used they should be not less than 5mm in thickness with a hardness of not less than 225 Brinell

Baffles should also be used to protect electrical, plumbing or other features that may be damaged or cause a ricochet if struck by a projectile.

### *Doorways and windows*

Any doorways or windows between the firing line and backstop must be covered with bullet proof material and must be securely locked during range activities. They must also be fitted with an alarm that is audible if they are opened. A warning notice is to be fixed to the external face of any door opening directly into the range. External down range doors should be locked from the inside.

### *Ventilation*

An adequate ventilation system, to accommodate the types of firearms being used, must be provided.

Regardless of the system used, the main points of ventilation design are to:

1. Provide clean air to the shooter.
2. Provide smooth air flow into the range.
3. Provide clean air to the target.
4. Create negative air pressure down range to draw the air away from the shooter.
5. Keep the range as clean as possible.
6. Keep the air in the shooter's personal breathing zones clean.
7. Comply with all Environmental Protection Agency standards.

Inert ventilators such as skylights, windows or air ducts in the area between the firing line and the bullet catcher must be defended to avoid the escape of projectiles or damage by projectiles.

### *Lighting*

Adequate lighting must be provided for the range. This should include general range lighting, target lighting, firing line lighting, and emergency & evacuation lighting.

### *Target frames*

Target frames are by their very nature liable to be damaged by projectiles. To reduce the risk of ricochet or backsplash from the target frames they should be made of penetrable material or defended by wood or similar material.

### *Target Placement*

Placement of targets is limited by the requirement to ensure that the line of sight from the muzzle through the centre of the target is contained by the bullet catcher or backstop.

## ***Identification of indoor pistol ranges***

Signs must be displayed at all range entry points indicating that the area is a pistol range. If the range is approved for multiple types of firearms, the words "Firearms Range - Danger, Keep Out" or similar may be used.

## ***Maintenance***

Keep the following in mind when considering the maintenance of shooting ranges:

*The design and construction of ranges creates conditions up to the target line which reduces the ricochet hazard to a minimum. It is therefore important that ranges are regularly and thoroughly maintained. Deterioration of the firing points, baffles or bullet traps will increase the chance of ricochet and in extreme cases may result in the closure of the range or restriction in its use.*

Ranges used for firing practice week after week will require proper maintenance. It is recommended that a maintenance day be set aside, on a weekly or monthly basis, or as required, to take care of additions and repairs. Annual maintenance periods should be planned to carry out major works, such as de-leading.

All baffles, protective plates and bullet catchers should be regularly inspected for buckling, holing warping or insecurity and repaired or replaced as required. This is particularly important with those surfaces subject to continuous fire on the beaten zone at

mean points of impact. In these locations distortion and holing rapidly occur when inferior or thinner steel sheeting is used.

The following housekeeping measures should be observed on an indoor pistol range to provide a safe working environment under the provisions of the Occupation Health and Safety Act:

- Utilise wet cleaning methods whenever possible to prevent agitation and suspension of lead dust in the air
- Dry dusting or sweeping should be prohibited
- If vacuum cleaners are required to collect un-burnt gunpowder, settled dust of other range debris from the floor or other surfaces, only industrial vacuum cleaners with multi-stage filtration ending with high efficiency particulate air (HEPA) filters are permitted
- Ranges without adequate ventilation are to have the firing benches and other flat surfaces cleaned daily. A longer interval between cleaning may be authorised for ranges with adequate powered exhaust ventilation.
- When wet dusting or cleaning is done, care must be taken that no wet sludge accumulates on surfaces, in cracks or edges where it can dry out and re-contaminate the area.
- Smoking, eating or drinking within the range is prohibited
- If extraction filters are fitted in the exhaust ventilation system they are to be cleaned regularly. The degree of regulatory will depend upon the types of range use and the frequency of use.
- Personnel should wash all exposed areas of skin after each firing practice.
- Clothing should be changed regularly if using the range over a long period of time
- Personnel involved in the cleaning of the range should change from and launder their clothing after completing the activity
- Personnel involved in the cleaning of the range should be provided with and wear suitable protective clothing and a respirator.

## ***Chapter 10 Air pistol ranges***

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Indoor air ranges are designed to ensure all rounds fired are confined within the range, and backslash and ricochet hazards to persons within the range are eliminated

Where the range is a dedicated air pistol range the following will apply:

- The ceiling, walls and the area behind the pellet trap must be made of a material able to prevent pellets from leaving the range;
- The pellet trap/backstop must be steel or a similar material, and must be constructed to direct expended pellets to the required area of the range;
- Inadvertent access forward of the firing line must not be possible.

### ***Design requirements***

#### *Pellet catchers*

Pellet catchers/traps should be either of a propriety type or be made of not less than 3mm mild steel.

#### *Backstop*

The end of the building used as a backstop must be rendered pellet proof from the floor to the ceiling, and for a width of three metres clear of the flank lines of fire. The normal acceptable angle of a steel deflector plate is 45 degrees deflecting downwards.

#### *Sidewalls*

Sidewalls must be of a material suitable to prevent pellets leaving the range.

Walls should be finished smooth and all joints should be flush. Where this is not possible large surface protrusions should be removed or defended against direct fire, backslash or ricochet.

#### *Baffles*

If installed, baffles must be able to prevent pellets penetrating the roof. If baffles are not installed, the roof must be able to prevent pellets leaving the range.

#### *Doorways and windows*

Any doorways or windows between the firing line and backstop must be covered with bullet proof material and must be securely locked during range activities. They must also be fitted with an alarm that is audible if they are opened. A warning notice is to be fixed to the external face of any door opening directly into the range. External down range doors should be locked from the inside.

#### *Lighting*

Adequate lighting must be provided over the firing line and target line.

### ***Identification of indoor air pistol ranges***

Signs must be displayed at all range entry points indicating that the area is a pistol range. If the range is approved for multiple types of firearms, the words "Firearms Range - Danger, Keep Out" (or similar) may be used.

## ***Maintenance***

Keep the following in mind when considering the maintenance of shooting ranges:

*The design and construction of ranges creates conditions up to the target line which reduces the ricochet hazard to a minimum. It is therefore important that ranges are regularly and thoroughly maintained. Deterioration of the firing points, pellet traps and backstop butt, will increase the chance of ricochet and in extreme cases may result in the closure of the range or restriction in its use.*

Ranges used for firing practice week after week will require proper maintenance. It is recommended that a maintenance day be set aside, on a weekly or monthly basis, or as required, to take care of additions and repairs. Annual maintenance periods should be planned to carry out major works.



## Appendix A Application for Approval of a Shooting Range or Paintball Location

Date of application: \_\_\_\_\_

Exact location of range: \_\_\_\_\_

### Applicant's Details

Surname: \_\_\_\_\_

Given name(s): \_\_\_\_\_

Date of birth: \_\_\_\_\_

Residential address: \_\_\_\_\_

Postal address: \_\_\_\_\_

Telephone: \_\_\_\_\_ (BH) \_\_\_\_\_ (AH)

Position of authority in club or organisation: \_\_\_\_\_

\_\_\_\_\_

### Range Type

Tick the type of range for which you are applying.

Pistol  Air Pistol  Full Bore  Small Bore  Shotgun

Paintball  Black Powder  Other (specify) \_\_\_\_\_

Type and calibre of firearms: \_\_\_\_\_

Type of ammunition: \_\_\_\_\_

### Organisation or Club Details

These details relate to the organisation or club under which the range will be controlled, administered or managed.

Name of organisation/club: \_\_\_\_\_

Postal address of organisation/club: \_\_\_\_\_

### Attached Documents

Tick the documents accompanying this application.

Approval letter from shire/council

Copy of public liability insurance cover

Copy of range safety orders

Firing rights document (if private or state-owned property is involved)

Copy of lease/ownership

- Scale plans of range
- Photographs of range Scale plans of locality of range
- Range danger area template/s

# Appendix B – Planning for new outdoor handgun and rifle ranges

The following is meant as a guide only to assist those people contemplating developing an outdoor firearm range. It outlines various considerations that may save the range operator time and money in

## *The safety plan.*

This plan focuses on how, what, when, why, and whom. This document is developed during the planning, design and construction phases of a range complex. The safety plan is a living document and must be continually reviewed and updated. If this plan is left to the end, the facility owner/operator may find some undesirable surprises as he prepares to open for business. The safety plan is an important portion of the master plan.

## *The 4-Es.*

The 4-Es should be used at every step of developing a shooting range and during its later use, they are evaluate, engineer, educate and enforcement.

### **Evaluate**

- the needs of the prospective user
- identify the specific shooting activities to be conducted on the facility. Each activity has its own design considerations. The use of a range outside its design limits or the approval limits by the regulating authority violates legislated requirements, engineering practices and basic safety practices. Considerations should include:
  - types of firearms,
  - calibres to be used
  - type of ammunition,
  - distances between firing line and target line,
  - shooting positions ie standing kneeling prone etc required.
- Evaluate how many shooting activities will be conducted on the same piece of ground, but not necessarily simultaneously.
- Setting times and schedules for various activities to ensure there are no conflicts in range usage is an important consideration.

While there are a few differing shooting activities that would be compatible and lend themselves to simultaneous range use, most are not.

**Engineer** each range to accommodate the specific activities which you have evaluated and are to be conducted on the same piece of ground/range.

Intimate knowledge of each activity and a rule book specifying the detailed requirements (if applicable) of each activity is essential. Each activity's requirements will have to be considered in detail to ensure no conflicts in firing line design, target line location, target placement and target set up, etc.

Time efficiency is also an important consideration when switching from one activity to another. While it is possible to conduct multiple activities on the same range, it will require deliberate thought and careful consideration to ensure possible conflicts are insignificant and kept to a minimum.

Once the design criteria have been established, it will be important for the owner/operator to truly understand that there will be very little room for change in use without returning to the evaluation phase with a view toward additional engineering to retro-fit the range to accommodate the new activity.

**Educate** the operators and those who will be using the facility (users) in the specific actions that are acceptable.

Firearms, firearm calibres, positions that can be used (standing, sitting/kneeling, prone), types of firing (slow fire only, rapid fire, etc.) are but a few topics that should be taken into consideration from inception as to how the range will or may be used.

Briefings on the etiquette of firearm safety, how and when to approach the firing line, how and when to change targets, commands that will be used-and their meanings, range officer authority, etc.

Careful consideration in this area will reasonably ensure that the facility will never be used outside of its design criteria and thereby cause problems for the owner/operator.

**Enforcement** is the final phase of the 4-Es and ultimately is the glue that will hold all these considerations together into one cohesive package.

Enforcement solidifies the safety plan. The owner/operator must consider the specific methods and actions that will be employed to ensure the range is always used within the design criteria.

Ultimately, it will be the responsibility of the owner/operator to determine the method to be used, assuring adherence to the rules and regulations established.

#### *Purpose of backstops, berms and baffles.*

The primary purpose for the construction of backstops, berms and baffles is to protect against the injury of people, the damage of property or both.

A secondary benefit is to permit the systematic recovery of fired lead projectiles-definitely a recoverable and recyclable resource that can contribute significantly to the positive cash flow of a range facility. .

#### *Projectile/bullet containment.*

It is the ultimate responsibility of the range operators to ensure that the projectiles fired on their range are contained within property boundaries. It is paramount that range operators continually evaluate the shooting activities permitted and the requirements necessary to ensure those activities can be conducted with projectile/bullet containment as a primary goal. The level of requirement necessary for the projectile/bullet containment on a shooting range facility will dictate the extent of the backstops, berms and baffle construction

#### *Range Danger Area (Shooting range safety fan/safety zone).*

It is important to frequently remember that while specific range danger areas are specified in the "Firearms Ranges – Standards for Approval Manual," these range danger areas presume a free and open range. As more and more controls and barriers are added to the design (both administrative and physical), the required range danger area becomes smaller until eventually the range danger area equals the exterior edges of the barriers. This point is not specifically made in any other part of the "Firearms Ranges – Standards for Approval Manual," and also is not a logical conclusion by those not familiar with range design and construction. These same people seize on a specification and fail to understand that by adding controls or barriers, the range danger area specifications are changed, usually significantly reduced.

Backstops and side berms do not remove the requirement to include a range danger area.

### ***Backstops***

The backstop provides the primary impact area for the bullets being fired on a particular range and under normal conditions prevents the bullet from leaving the range proper. An important factor to remember at this point is the construction of an otherwise proper backstop will not eliminate the requirement to provide for the normal down range range

danger areas beyond the backstop for the type of firearm or calibre permitted to be fired. The probability of an accidental (firearm malfunction) or unintentional discharge where the bullet escapes the range without first impacting the backstop must be evaluated and considered in the original range design. This must be re-evaluated as the surrounding land use changes.

A major consideration for initial construction is to provide sufficient space for ease of backstop repair and lead recovery. All too often, ranges are constructed allowing for the maximum number of firing points and targets in the shortest acceptable width and distance, but with insufficient space to allow regular maintenance or heavy equipment access to the range firing or target line. Special consideration is to provide sufficient space for manoeuvrability of heavy equipment between the target line and the backstop.

The best outdoor backstop is a man-made earth embankment or a natural hill of appropriate size and shape that meets the specific requirements of a particular site. Alternative backstops may be used when appropriate earthworks are not available.

Backstops can include:

- naturally occurring hills or mountainsides (shaping the slope will normally be required),
- earthen backstops constructed from clean fill,
- earthen backstops constructed from broken material (concrete or asphalt) and covered with clean fill dirt,
- earthen backstops constructed from clean fill and stabilised internally, and
- fabricated backstops using steel or wooden cribs.

Backstop heights can vary according to the site and use. This height defined in the Firearms Ranges – Standards for Approval manual are the compacted or settled height. Height should also be consistent with other barriers that may be incorporated into the range design.

A ricochet catcher, ricochet baffle or eyebrow can be installed to reduce the incidence of bullets escaping the range by sliding up the face of the backstop. The ricochet catcher is designed to retain only those ricochets that occur on the face of the backstop. While the distance travelled by such a ricochet would be nominal, this factor will nevertheless need to be included in the design calculations. These devices are installed approximately perpendicular to the backstop face and extend 1.5 to 2 metres out from the slope. The base of the ricochet catcher is typically 4 to 5 metre above the range floor, measured vertically from the ground surface at the target line. This prevents direct bullet impact into the catcher. Once major specification is that the ricochet catcher must be impenetrable to ricochets and should extend completely from side to side and connect the sidewalls. If overhead baffles are employed, the top of the backstop need only be 1 to 1.5 metres higher than the ricochet catcher. Specific construction details of the ricochet catcher will dictate the amount of material needed to ensure that the catcher is held securely in place.

### ***Side berms and walls***

These protective barriers may be constructed from earth, precast concrete panels, masonry walls, wooden cribs, wooden box-type structures filled with pea-gravel, crushed rocks, and/or poured concrete walls or panels. The specific type of structure will depend on available space, type of range being built and the relative initial cost. A major consideration that should be evaluated during the initial planning process is the long-term maintenance cost of the barrier being considered. Most times it is far more cost-effective to select the construction material that will provide the longest life while requiring the least maintenance.

Exposed tyres present problems such as bullet bounce-back and for this reason are not permitted to be used. If earthen side berms are selected, the construction methods will be the same as that used for the construction of the backstop. If concrete panels are selected, then some site work will be required to build their foundations. Concrete panels can be

tipped into place or set into place using a crane. If masonry walls are selected, only skilled masons should be used. A substantial foundation will be required to prevent settling cracks or major damage caused by ground shifting. Experienced engineers and concrete companies should be employed to erect concrete structures, especially in earthquake-prone areas.

Generally, earthmoving equipment will be used to construct the main backstops. If earthen side berms are the choice then retaining the equipment on-site to construct the side berms is often the most cost effective. Side berms generally vary in dimensions according to the specific need. However, if a side berm is to be used also as a backstop, as some shooting activities may require, then the side berm is considered to be part of the backstop and should conform to the same specifications as the backstop. In this situation, the overall height of the side berm, for at least that portion that is used as a backstop, should be the same as the backstop. It is important to remind all range owners/operators to carefully evaluate the shooting activities to be incorporated into their range facility and include them in the master plan.

Masonry walls are an alternative, but they should not be selected over precast or tip-up walls. The repair work for damaged masonry walls is often both labour intensive and expensive, whereas a precast panel can be removed and replaced with minimal effort and expense. Initially, an additional number of the precast panels can be purchased, which should significantly reduce the cost of such panels over having them cast again at a future date. Masonry walls using voided concrete block should be fully grouted and filled with concrete to add strength and impenetrability to the structure. Masonry walls should be reasonably protected against bullet strikes.

Wooden side baffles filled with selected materials may be used, but are not easily constructed, repaired or maintained. Obviously, the designs for side baffles will depend upon local site conditions and available materials. A point to be made about wooden box side baffles is that they must be tested before being built to ensure that they will stop the bullet for the calibre to be used. It is the rare exception that will require this type of structure to be more than 4 inches thick. A structure made to the thickness of 6 inches will stop all bullets from normally accepted sporting arms and individual infantry military small arms. If there are doubts construct a test panel and conduct the appropriate tests before committing to any major construction expense. Test twice before building once.

Precast concrete panels set at angles on each side of the range can prevent bullets, regardless of the angle fired laterally, from escaping the range. Generally, panels are manufactured onsite and tipped into place. These barriers withstand most bullet strikes without major damage. Stringent range laws can prevent shooters from inadvertently firing into the barriers. Shooters must demonstrate the appropriate skill necessary not to cause damage to range equipment.

### ***Safety baffles***

The term safety baffle or overhead safety baffle defines a structure that is used to restrict fired bullets to smaller areas than would otherwise be possible without them. Safety baffles differ significantly from sound baffles, which are designed to absorb or redirect sound waves. Safety baffles are designed to be impenetrable.

The basic concept is on the "blue sky gap." This means that baffles are erected so that the shooter, regardless of the shooting position used (or permitted) cannot see any sky down range, either over the top of the backstop or to the sides of the range.

Safety baffles may be overhead, on the ground, on top of the backstop, in the roof of the firing line cover, in the form of an elongated box, or as a completed enclosed tunnel. The principle behind the design is to equip a range with baffles so that if a fired bullet leaves the confines of the range proper, it will fall to earth within a smaller, more predictable area that is acceptable to protect people or property adjacent to the range.

If overhead safety baffles are not designed and installed properly, they can cause problems. They may redirect the fired bullet in the wrong direction, may not absorb the fired bullet as intended, or there may be gaps that will permit a bullet to escape the range.

For any range on which overhead baffles are planned, carefully analyse the application beforehand and seek professional advice.

General specifications say that safety baffles must:

- must be effective
- must be impenetrable for calibres to be used on the facility.
- must be relatively maintenance-free.

The specific design and number of baffles that will be needed to protect a given area will be dictated by the amount of free space around a particular range facility.

It also is important to keep in mind that it may be necessary to incorporate a series of ground baffles within the overall design. Ground baffles reduce the ground surface area that a bullet might strike. When properly designed and installed, ground baffles do reduce ricochets, but do not totally eliminate them. When the down range area is viewed from the firing line, the shooter will see overhead baffles, ground baffles and the target and backstop immediately behind the target. No blue sky will be visible, nor will any of the horizontal ground surfaces of the range.

When developing the overall safety plan, when overhead and ground baffles are to be incorporated, the level of protection will be dictated by the free space down range. For example, will the down range free space permit a 45-degree ricochet escape, or must the angle be increased to 60 degrees or higher? The maximum protection is to install the overhead baffles to protect against a 90-degree ricochet. That is tantamount to an indoor range level of protection. The amount of free space available outside the range barriers will dictate the level of ricochet protection required.

### *Summary*

The bottom line is to develop a shooting range in harmony with adjacent properties and where safety is provided to prevent adjacent properties from experiencing any encroachment. All neighbours must be safe from injury. The overall responsibility of the range owner/operator is to stop fired bullets before they exit the property line.

## Appendix C - How to plan permanent overhead baffles

By following the procedure set out below prepare to scale a longitudinal (side view) section of the range clearly indicating:

- the groundline,
- target heights (to centre of target),
- Bullet catcher and/or stop butt wall height.
- Heights of firing points
- To scale, above each firing point, mark the selected worst firing position, which will ever be utilised.

An example construction is shown below and should be followed in detail. The example uses 50, 25 and 10 metres as the selected firing points. Where other distance are used they may be applied in the longitudinal section however care should be taken because the section will become to difficult to read and interpret if a small scale plan is prepared.

1. The maximum stop butt height should be described from each firing point, (worst case position). The points at which these heights meet the stop butt should be marked "A" for the maximum at 50 metres, followed by "B" and "C" to indicate the maximums, for the 25 metre and 10 metre, as shown in this example.
2. Join point "A" to its firing position at 50 metres and describe this line as "AD". Join "B" to its firing position at 25 metres and describe the line as "BE". Join Point "C" to its firing position at 10 metres. And describe the line as "CF".
3. Select the height of stop butt available and mark the height on the stop butt as "G".
4. Join point "D" to "G", "E" to "G" and "F" to "G". These represent the lower limits of baffles from each firing point related to chose height "G".
5. Any baffle, which satisfied the 10 metre distance by cutting the "FG" line, will satisfy all ranges. Clear sight of the target should be allowed by providing at least 600mm above the highest firing position related to 250mm above the chosen target. These lines are shown as "IH", "JH" and "KH". No baffle may fall below these lines.
6. For baffling at 10 metres section, any baffle built from almost any acute angle up to and including vertical, which cuts the line "FC" beyond point "M" and the line "FG" beyond "L", is satisfactory. By extending the chosen baffle to cut line "AD" the baffling for all given ranges would be adequate.
7. Where the baffle cuts "CF" beyond point "N", part of the requirement for baffling at 25 metres will be met.
8. Baffles for 25 metre ranges are required to cut the line "EB" beyond point "P". Beyond point "Q", it will satisfy some of the requirements for the 50 metre baffling. Line "EG" also requires to be cut beyond point "O". This last, however, will be modified where baffles beyond point "N" provide partial cover. In this case the baffles should overlap 100-150 mm, so that continuity of baffle is achieved, when viewed from the 25 metre firing point.
9. At 50 metres the same principle applies, line "AD" must be cut beyond point "S". Line "DG" must be cut beyond point R.

10. This last will again be modified where baffles beyond point “Q” provide partial cover. As in the previous case, overlaps 100-150 mm, so that continuity of baffle is achieved, when viewed from the 50 metre firing point.
11. Of the two choices illustrated at <<<, there is little difference in the total depth of the baffle provided at “Y” or “Z”.
12. Care must be exercised where ground slopes across the range to any great degree, as different levels and line of sight will be introduced. In such cases several longitudinal sections should be prepared and the baffles varied in height and depth along their lengths, to suit the conditions.
13. Where both side and overhead baffling is to be used, it is more economical to plan a continuous baffle near the stop wall, to cut lines “FG” and “AD” in one face, such as to coincide with the vertical baffles. Normally these vertical baffles can only be erected in that general area, with both safety and economy.
14. It should be borne in mind, however, that the further the horizontal baffles are from the stop wall, the narrower is their required overall width. This width can be readily discovered by plotting the vertical locations onto the plan view of the (other) ????? The required length can be then measured off the points where they cut the theoretical safe flank angle on either side.??

## Insert Diagram

All baffles, protective plates and bullet catchers should be regularly inspected for buckling, holing warping or insecurity and repaired or replaced as required. This is particularly important with those surfaces subject to continuous fire on the beaten zone at mean points of impact. In these locations distortion and holing rapidly occur when inferior or thinner steel sheeting is used.

## Appendix D - Ventilation

Adequate exhaust ventilation and filtration are required to provide clean air at the firing points and to effect engineering control of the contaminated air. Ventilation system parameters that ensure adequate protection at the firing points and provide control of contaminated air must be designed for each specific location. Retro-fit of ventilation systems in existing ranges or buildings being considered to be adapted to ranges is technically complicated and expensive. Therefore appropriately qualified ventilation engineers should be used for all proposed range ventilation systems.

### *Ventilation systems considerations*

There are two reasons for installing a ventilation system in an indoor range. They are:

- to protect employees and shooters from the hazards of vapourised lead and powder.
- to eliminate smoke so that shooters can see the target.

Before designing a ventilation system, it is necessary to determine the type of shooting that will occur. Considerations will include:

- Type of firearms to be used:
  - Rimfire
  - centrefire
  - longarms
  - handguns,
  - shotguns
- The rate of fire of firearms used on the range – single shot, semi-automatic, full automatic
- Maximum number of users at any one time
- Climatic conditions may require heating and cooling.

### *Types of ventilation systems*

There are two basic types of ventilation systems:

- A "straight through" system brings outside air (supply air) into the range, passes it through the range and exhausts it out the back of the range. The air goes "straight through" the range.
- A recirculating system. This system recirculates a large percentage of range air multiple times through the range. However, a portion of the air also is continuously exhausted. An outside air supply is needed to make up for exhausted air. Recirculating systems are used in climates where buildings require buildings significant heating or cooling. Due to costs, you do not want to heat or cool air and use it only one time.

Local climatic conditions will dictate which system you will use. Recirculating systems generally are more expensive to install, operate and maintain, but energy savings are significant. In some parts of the country where you need limited heating or cooling, either system would work.

### *Balanced air flow required*

In both types of systems, the airflow must be balanced. The supply air must be slightly less than the exhaust air to create negative air pressure down range. Negative air pressure

down range ensures that the air will flow from the supply air past the shooter to the exhaust fan. Under no circumstances do you want "down range air" to flow past the shooter. Establishing a clean personal breathing zone around the shooter is critical in any ventilation design. Allowing dirty, down range air to drift past the shooter defeats the purpose of a ventilation system.

Balancing a recirculating system is much more difficult because it is complex and only part of the air is being exhausted.

The equipment for either system basically is the same: blowers, filters and exhaust fans. Recirculating systems generally need additional ducts and exhaust fans as well as heating and/or cooling units. On a "straight through" system, clean air is supplied from an outside source. Sometimes this air needs to be filtered before it enters the range. This especially is true in areas that have a lot of dust in the air. It often is a good idea to put pre-filters in as well as filters. Pre-filters generally catch the larger particles, which quickly can clog finer filters and prevent them from working properly. Pre-filters generally are much less expensive and useful in protecting your more expensive filters.

### *Air flow problems*

The biggest problem with the ventilation systems in most ranges is in the supply air and its flow across the shooting line. The design goal is to have a constant, even flow or wall of air moving from the supply air down range to the exhaust area. This often is difficult to do because of other range design elements such as viewing windows and entrance doors.

Ideally, the wall behind the shooter should act as an "air reservoir" to allow the air to stabilise and flow evenly down range past the shooter. Once the air flows past the shooter there is less concern about turbulence unless the air flows back toward the shooter.

The glass viewing areas along the back wall may present design problems in trying to stabilise supply air. Doors leading into the range also are often placed along the back wall. Every time the door is opened, a disruptive air flow pattern is established, making it difficult to provide the even air flow necessary to protect shooters.

Supplemental air supply ducts above and slightly behind the shooters have proven unsuccessful, but are more costly and add additional difficulties in balancing the entire air flow.

### *Air flow recommendations*

In recirculating systems, an exhaust duct is often placed between 15 and 25 feet down range of the shooters. Approximately 20 feet seems to be the best compromise. This allows the highest concentration of contaminated air to be removed quickly and efficiently. The exhaust air should remove 15 to 40 percent of the air at this time. The remaining air continues down range where it is collected in ducts, filtered and returned to be united with outside makeup supply air and directed back down range. The recirculated air is often heated or cooled before it is united with the make-up air. Balancing a recirculating system to ensure all air flow is working in unison is a complex task.

It is recommended that air flow at the shooting line be approximately 60 to 75 feet per minute. This may or may not be needed depending on the configuration of the shooting booth and overall air flow through the range. Air flow is more accurately defined as air exchange and measured in cubic feet per minute (CFM).

The ideal CFM is a function of a particular range. It needs to be adequate to protect the shooter and clear smoke. Again, the air flow must be balanced for the entire range.

On "straight through" systems, the exhaust fans generally are located behind the traps. This air is collected, filtered and vented directly outside. Eighty to 90 percent-efficiency filters are generally adequate for "straight through" systems.

### *Filter types and recommendations*

There is a lot of confusion about what types of filters are needed. As stated earlier, pre-filters are generally a good idea and save wear-and-tear on more expensive fine filters. In many cases an HEPA (High Efficiency Particulate Air) filter is not needed to meet any codes or standards in your area. A HEPA filter is rated at 99.97 percent efficiency. This level of efficiency is not needed for most applications. A 95 percent-efficient filter will remove all lead and most smoke. However, you should check your local government authority regulations to be sure. Regardless of the filter system used, it is extremely important to ensure that the air in the shooter's personal breathing zone is clean.

It is more economical to use filters with larger surface areas and more pleats than to use filters with smaller surface areas and fewer pleats. The surface area of a filter is a function of the number of pleats it has. A large number of pleats made of thinner material is more economical than a filter constructed with a fewer number of pleats made of thicker material. Thinner filters that have more pleats are less expensive and require fewer powerful fans to pull or push air through them. These thinner filters also can be set up in a series to have three to five filters in one housing unit rather than to have just one thick one. Filters with larger square footage will last longer, can be rotated as they become full and require fewer powerful air fans to make them work. All of these considerations reduce the operating costs of the system.

### *Considerations for shooters' booths*

All booths create an obstacle to air flow which then creates turbulence. Turbulence caused by the booths is more critical because that is where the shooters are. Generally, smaller booths with thinner side walls and table areas are better. Half doors on the bottom of the booths should be avoided. However, walling in the area over the shooters' heads can be a good idea if the ceiling is high. Ideally, the booth area should be a "pinch point" in the air flow area which will cause the air to flow more rapidly through that area and remove any toxins and smoke that much quicker. However, booths need to be configured so that there are no eddies or pockets near the shooter in which smoke or contaminated air can accumulate. Once equipment is installed, it must be carefully balanced.

Part of the ventilation design should include dampers on all parts of the system that handle supply air, exhaust air and recirculating air. Dampers adjust and balance the air flow.

### *Conclusion*

Regardless of the system you use, the main points of ventilation design are to:

1. Provide clean air to the shooter.
2. Provide smooth air flow into the range.
3. Provide clean air to the target.
4. Create negative air pressure down range to draw the air away from the shooter.
5. Keep the range as clean as possible.
6. Keep the air in the shooter's personal breathing zones clean.
7. Comply with all Environmental Protection Agency standards.

The only way to know if the air flow is correct is to test it. When tests are being conducted, shooters or mannequins should be in the shooters' booths to identify, regulate and balance turbulence.

### *House keeping*

The following housekeeping measures should be observed to provide a safe working environment under the provisions of the Occupation Health and Safety Act:

- Utilise wet cleaning methods whenever possible to prevent agitation and suspension of lead dust in the air
- Dry dusting or sweeping should be prohibited
- If vacuum cleaners are required to collect settled dust from the floor or other surfaces, only industrial vacuum cleaners with multi-stage filtration ending with high efficiency particulate air (HEPA) filters are permitted
- Ranges without adequate ventilation are to have the firing benches and other flat surfaces cleaned daily. A longer interval between cleaning may be authorised for ranges with adequate powered exhaust ventilation.
- When wet dusting or cleaning is done, care must be taken that no wet sludge accumulates on surfaces, in cracks or edges where it can dry out and re-contaminate the area.
- Smoking, eating or drinking within the range is prohibited
- If extraction filters are fitted in the exhaust ventilation system they are to be cleaned regularly. The degree of regulatory will depend upon the types of range use and the frequency of use.
- Personnel should wash all exposed areas of skin after each firing practice.
- Clothing should be changed regularly if using the range over a long period of time
- Personnel involved in the cleaning of the range should change from and launder their clothing after completing the activity
- Personnel involved in the cleaning of the range should be provided with and wear suitable protective clothing and a respirator.



# Range Inspection Checklist Cover Sheet

(Attach specific/individual checklist for type of range/s)

## General

Name of range:

Date inspected:

GPS Location:

Inspected by:

Location of range:

Type of range:

Pistol  Air Pistol  Full Bore  Small Bore

Shotgun  Paintball  Black Powder  Centre Rifle

Other (specify)

Frequency of use:

Daily  Weekly  Fortnightly  Monthly

Weekend use?

Yes  No

A.M. only  P.M. only  A.M. and P.M.

Club representatives names:

Number of members:

Affiliated with:

## Facilities

Club house provided?

Yes  No

Club house phone no:

Power provided?

Yes  No

Type of water supply:

Tank  Bore  Town

Type of toilets:

Male only  Female only  Male and Female

Owner of facilities

(including target facilities):

Commonwealth  Club  Council  Club

Other (specify)

Professional appearance?

Yes  No

Neat and tidy?

Yes  No

Rubbish or overgrowth present?

Yes  No

Evidence of new or recent  
earthworks or repairs?

Yes  No

## Identification

Fencing	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
	Adequate <input type="checkbox"/>	Not adequate <input type="checkbox"/>	
Signs	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
	Adequate <input type="checkbox"/>	Not adequate <input type="checkbox"/>	
Flags	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
	Adequate <input type="checkbox"/>	Not adequate <input type="checkbox"/>	
Red warning lights	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not applicable <input type="checkbox"/>
	Adequate <input type="checkbox"/>	Not adequate <input type="checkbox"/>	

Dispensation granted re any of above

Yes  No

If yes, why

## Firearms stored on premises?

Yes  No

If yes, description of storage facilities:

## Ammunition stored on premises?

Yes  No

If yes, description of storage facilities:

## Surrounds

Current zoning:

Distance to nearest residence:

Approaching road standard: Adequate  Inadequate

Map provided: Yes  No

## Special conditions to be applied to approval:

Yes  No

If yes, provide details

## Additional requirements to be meet before approval

Yes  No

If yes, provide details

## Range approved

Yes  No

# APPENDIX FOR INDOOR PISTOL/RIFLE RANGE INSPECTIONS

(If multiple ranges complete one for each range)

**Club Name**

**Range Name or Number**

## Basic Range Details

Distance of firing lines to target (in metres/yards): 10  25  50  75  100   
Other (specify)

## Firearms Used

Type of firearms: Rifle  Pistol  Shotgun   
Centrefire  Rimfire  Other (specify)

Calibre(s):

Projectiles

Type: Jacketed  Semi-jacketed  Unjacketed

## Firing Lines

Number of firers:

Width of Firing Line metres

Firing position markers or  
pegs present?

Yes  No  N/A

Available firing positions:

Prone  Supine  Sitting  Squatting   
Kneeling  Standing  Other (specify)

Line of sight

Parallel to centre line? Yes  No

If "No" Converging  Diverging

Additional comments

## Range Surface

Barricades/posts present? Yes  No

If yes, type of barricade/posts: Penetrable  Non-penetrable   
Defended  Undefended

Visible concrete/steel? Yes  No

Taps and watering devices? Yes  No

If yes, type of taps/devices: Penetrable  Non-penetrable

Intermediate firing points: Flush  Proud  N/A   
Concrete  Fine  Screen   
Sand  Other (specify)

Evidence of projectiles striking range floor

Yes  No

Maintenance: Adequate  Inadequate

Additional comments

## Target Lines

Number of targets:

Width of Target Line metres

Target material: Penetrable  Non-penetrable

Target frame material: Penetrable  Non-penetrable

Defended  Undefended

Indications of splashback? Yes  No

Evidence of ricochet off target frame or target

Yes  No

Target mechanism type:

Condition and function of target mechanism

Stability: Adequate  Inadequate

Operation: Adequate  Inadequate

Rope/Wire: Adequate  Inadequate  N/A

Pulleys: Adequate  Inadequate  N/A

Target lighting available? Yes  No

Targets numbered? Yes  No  N/A

Location of numbers: Target Frame  Stop Butt  Other  (specify)

Numbers penetrable? Yes  No

Condition of numbers: Adequate  Inadequate

Does target placement ensure line of sight from muzzle through centre of target to stop butt/  
back stop/ bullet trap Yes  No

Additional comments

## Side Walls

Composition/Material:

Suitable to retain projectiles Yes  No

Evidence of graze marks,  
indication of bullet strikes? Yes  No

Additional comments

## Baffles

Applicable  Not applicable

Overhead baffles Yes  No

Adequate  Inadequate

Type of baffles Vertical  Angled  Other  (Describe)

Wood  Metal  Other  (Describe)

Number of baffles

### Spacing between baffles

Side baffles                      Yes                       No                       N/A   
Adequate                       Inadequate

Type of baffles                      Vertical                       Angled                       Other  (Describe)  
Wood                       Metal                       Other  (Describe)

Number of baffles  
Additional comments

### Back Stop

Type:                      Proprietary steel                       Sand                       Earth                       Timber   
Other (specify)

    If proprietary steel  
    Description

Extent beyond line of sight:                      (above)                      (below) metres

Extent beyond flank  
line of sight:                      (above)                      (below) metres

Indication of splashback at  
short ranges?                      Yes                       No

Bullet tray:                      Sand  Water                       Metallic                       Other (specify)

De-leading:                      Adequate                       Inadequate

Access for maintenance:                      Adequate                       Inadequate

Spent projectiles  
    Calibre and type:  
Additional comments

### Lighting

Adequate                      Yes                       No   
Type                      Fluro                       Spotlight                       Bulb                       Natural                       Combination

### Ventilation

Adequate                      Yes                       No   
Type                      Extractor                       Blower                       Other                       Natural

### Special conditions to be applied to this range:                      Yes                      No

If yes, provide details

**Additional requirements to be meet before approval**    Yes     No

If yes provide details

# APPENDIX FOR OUTDOOR PISTOL/RIFLE RANGE INSPECTIONS

(If multiple ranges complete one for each range)

Club Name \_\_\_\_\_

Range Name or Number \_\_\_\_\_

## Basic Range Details

Centre line bearing: \_\_\_\_\_ degrees magnetic

Firing line: \_\_\_\_\_

Stop butt: \_\_\_\_\_

Target line: \_\_\_\_\_

Distance of firing lines to target (in metres/yards): 10  25  50  75  100   
200  300  400  500  600  700  800  900  1000

Other (specify) \_\_\_\_\_

Affected by danger areas of other ranges? Yes  No

## Firearms Used

Type of firearms: Rifle  Pistol  Shotgun   
Centrefire  Rimfire  Other (specify) \_\_\_\_\_

Calibre(s): \_\_\_\_\_

Projectiles Type: Jacketed  Semi-jacketed  Unjacketed

## Firing Lines

Number of firers: \_\_\_\_\_

Width of firing line \_\_\_\_\_ metres

Firing position markers or pegs present? Yes  No  N/A

Surface: Adequate  Inadequate

Available firing positions: Prone  Sitting  Squatting   
Kneeling  Standing  Other (specify) \_\_\_\_\_

Line of sight

Parallel to centre line? Yes  No

Diverging  Converging  Rising/Falling

Shelter provided? Yes  No

Additional comments \_\_\_\_\_

## Range Surface

Barricades/posts present? Yes  No

If yes, type of barricade/posts: Penetrable  Non-penetrable

Defended  Undefined

Visible concrete/steel? Yes  No

Taps and watering devices? Yes  No

If yes, type of taps/devices: Penetrable  Non-penetrable

Intermediate firing points: Flush  Proud  Concrete  Fine  Screen   
Sand  Other (specify) \_\_\_\_\_

Type of slope: Rising  Falling  Level  Lateral fall

Evidence of projectiles striking range floor

Yes  No

Does range cross footpaths or  
vehicle tracks?

Yes  No  N/A

Maintenance:

Adequate  Inadequate

Additional comments \_\_\_\_\_

## Target Lines

Number of targets: \_\_\_\_\_

Width of Target Lines \_\_\_\_\_ metres

Target material: Penetrable  Non-penetrable

Target frame material: Penetrable  Non-penetrable   
Defended  Undefended

Indications of splashback ? Yes  No

Evidence of ricochet off target frame or target

Yes  No

Target mechanism type: \_\_\_\_\_

Condition and function of target mechanism

Stability: Adequate  Inadequate

Operation: Adequate  Inadequate

Rope/Wire: Adequate  Inadequate  N/A

Pulleys: Adequate  Inadequate  N/A

Target lighting available? Yes  No

Targets numbered? Yes  No  N/A

Location of numbers: Target Frame  Stop Butt  Other  (specify)

Numbers penetrable? Yes  No

Condition of numbers: Adequate  Inadequate

Does target placement ensure line of sight from muzzle through centre of target to stop butt/  
back stop/ bullet trap Yes  No

Additional comments \_\_\_\_\_

## Stop Butts/Back Stop

Composition/Material: \_\_\_\_\_

Height

New range minimum 5 metres? Yes  No

Established range minimum 4 metres? Yes  No

Face of backstop

Slope minimum 30 degrees? Yes  No  ..... degree

Visible hard material? Yes  No

Crest thickness 1.5metres? Yes  No

Stability: Adequate  Inadequate

Erosion/animal burrows: Evident  Not evident

Evidence of bullet scoops  
or bullet strikes? Yes  No

De-leading: Adequate  Inadequate

Evidence of ricochet off stop butt Yes  No

Access for maintenance: Adequate  Inadequate

Additional comments

## Side Walls

Composition/Material: Left wall

Right wall

If Earth: Compacted  Not compacted

Visible hard material? Yes  No

Stability: Adequate  Inadequate

Erosion/animal burrows: Evident  Not evident

Height

Minimum of 2.2 metres? Yes  No

Evidence of graze marks,  
indication of bullet strikes? Yes  No

Evidence of ricochet off side walls Yes  No

Additional comments

## Danger Areas

Terrain behind targets: Mountain  Hill  Flat  Cultivated   
 Pasture  Scrub  Swamp  Sea   
 Other (specify) \_\_\_\_\_

Hill background dispensation? Yes  No

If yes, details of dispensation: \_\_\_\_\_

Seaward marking required? Yes  No

If yes, details of marking: \_\_\_\_\_

Buildings present? Yes  No

If yes, details of buildings: \_\_\_\_\_

Roads, paths or tracks present? Yes  No

Evidence present that area has been accessed? Yes  No

If yes, method used: Foot  Cycle  Vehicle

Fences and gates: Adequate  Inadequate

Key control? Yes  No

Warning signs: Adequate  Inadequate

Flags: Adequate  Inadequate

Warning Lights: Adequate  Inadequate  N/A

**Baffles** Applicable  Not applicable

Purpose of baffles

Total contain projectiles Yes  No

Restrict elevation Yes  No

Overhead baffles Yes  No  N/A

Adequate  Inadequate

Type of baffles Vertical  Angled  Other  (Describe)

Wood  Metal  Other  (Describe)

Number of baffles \_\_\_\_\_

Evidence of projectiles striking baffle or ricochet off baffles

Yes  No

Side baffles Yes  No  N/A

Adequate  Inadequate

Type of baffles Vertical  Angled  Other  (Describe)

Wood  Metal  Other  (Describe)

Number of baffles \_\_\_\_\_

Evidence of projectiles striking baffle or ricochet off baffles

Yes  No

Adjustable height baffles                      Yes                              No                         N/A     
   Adequate  Inadequate   
Type of baffles                      Vertical      Angled      Other    (Describe)  
   Wood      Metal      Other    (Describe)  
Number of baffles                      \_\_\_\_\_  
Evidence of projectiles striking baffle or ricochet off baffles  
   Yes    No

Movable location baffles                      Yes                              No                         N/A     
   Adequate  Inadequate   
Type of baffles                      Vertical      Angled      Other    (Describe)  
   Wood      Metal      Other    (Describe)  
Number of baffles                      \_\_\_\_\_  
Evidence of projectiles striking baffle or ricochet off baffles  
   Yes    No

Additional Comments  
\_\_\_\_\_  
\_\_\_\_\_

**Firing Rights**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

**Special conditions to be applied to this range:**    Yes  No

If yes, provide details

**Additional requirements to be meet before approval**    Yes     No

If yes provide details