New Nouveau Brunswick
PUBLIC SAFETY

STANDARDS FOR DESIGN AND CONSTRUCTION OF SHOOTING RANGES IN NEW BRUNSWICK

CHIEF PROVINCIAL FIREARMS OFFICE
DEPARTMENT OF PUBLIC SAFETY
PROVINCE OF NEW BRUNSWICK

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INTRODUCTION

This document has been developed for the purpose of establishing design, construction and inspection standards for shooting ranges in the Province of New Brunswick, in accordance with the *Firearms Act*.

The following Standards have been developed with one major objective in mind: safety of shooters and the general public. A completely safe range cannot be designed. A "safe range", results only if it is safely operated and if participating shooters are controlled by rules and safety policies, which must be enforced. Training in the safe use of firearms and adequate supervision of shooters are the best methods of accident prevention.

In addition to using a range in a safe manner, a range must be designed and maintained in such a way that bullets are contained within the range, ***if used under normal conditions, where firearms are discharged in accordance with the safety rules*** (as per Section 5(a)(i), p. 120 of the *Firearms Act Regulations*).

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RATIONALE FOR DEVELOPING STANDARDS FOR DESIGN AND CONSTRUCTION FOR SHOOTING RANGES FOR THE PROVINCE OF NEW BRUNSWICK

A Provincial Firearms Advisory Committee was established in September 1999, by the provincial government in cooperation with the Chief Firearms Office. Its purpose was to advise and recommend possible changes or modifications to the *Firearms Act and Regulations* and to assist the Chief Firearms Office in developing policies related to the application of the new firearms legislation in the Province. The members of that committee were chosen because of their experience, knowledge, expertise and long time involvement in the sporting and shooting community. (See Appendix A, Provincial Firearms Advisory Committee members)

One of the challenges of the Provincial Advisory Committee was to review and develop range standards for the Province of New Brunswick. In doing so, the committee looked at the guidelines by which ranges had been built in this Province and a document on ranges developed for the Canadian Firearms Center, *RANGE DESIGN AND CONSTRUCTION GUIDELINES*. The Provincial Firearms Advisory Committee spent considerable time and effort reviewing this document in order to develop Standards for the Province of New Brunswick.

It should also be noted, that the "*RANGE DESIGN AND CONSTRUCTION GUIDELINES*" have been developed to assist the provinces in the approval for the safe designs and operation of shooting ranges. The province(s) may use that document if it so chooses, or may develop their own standards. The federal document states the following : **The Chief firearms Officer of each province and territory, as designated by their respective responsible ministers under the *Firearms Act,* will determine the particular criteria and procedures for approval of shooting ranges within their jurisdictions.** (Page 4 of that said document)

That being said, ***the Provincial Firearms Advisory Committee felt the necessity of developing standards for design and construction of shooting ranges for the province,*** one that would allow existing ranges and future ones to operate safely, within the context and reality of the Province of New Brunswick. The rationale for this decision is based on many factors, some of which are:

The Federal guidelines are based on military ballistic standards;

RATIONALE FOR DEVELOPING STANDARDS FOR DESIGN AND CONSTRUCTION FOR SHOOTING RANGES FOR THE PROVINCE OF NEW BRUNSWICK (CONTINUED)

- All the shots fired at gun ranges are "aimed shots", not requiring the design standards that are required on a military range;
- The actual and historical use of ranges in the Province has been a practical test for the safety of ranges in New Brunswick. The range safety record in New Brunswick is excellent. The Committee therefore felt that great efforts should be made to ensure existing ranges remain in operation. This however, does not mean that changes should not be made in order to improve the safety standards and comply with the *Firearms Act and Regulations*;
- Hunters need ranges to sight-in their rifles otherwise they will use pits, backyards, wooded areas, near camps, etc., places where no safety standards or rules are in place. The Committee feels that this would create a safety hazard for the general public;
- Recreational shooters and sport hunters need facilities to practice their favorite sport, one that is safe, fun, family based and a socially acceptable recreational activity. Making ranges readily available in their area increases the level of marksmanship and hunter proficiency;
- Some shooters may opt to give up hunting if there are no nearby shooting ranges to sight-in and practice, resulting in significant economic losses for the Province;
- Ranges are used not only for competition and hunter sight-in, but also for hunter training education, firearms safety education, police and security officers;
- The committee feels that a simplified, practical, condensed document, that will not compromise safety, would best serve range owners and clubs.

Note:

The Provincial Firearms Advisory Committee, with the support of DNRE and Public Safety, agreed to prepare ***Standards for Design and Construction of Shooting Ranges for New Brunswick.*** *These Standards were adopted by that, said Committee at a meeting held in September 2000. The committee recommended that the Province adopt the proposed* ***Standards for Design and Construction of Shooting Ranges for New Brunswick.***

A presentation was made in February 2001 to government officials. These standards have since been adopted by the provincial government and are now official.

This document will be the official standards used by the Chief Firearms Office for inspection and approval of ranges, the standards sent to owners or clubs for maintaining existing ranges, and the same standards for individuals or associations wishing to build future ranges.

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SECTION 1
OUTDOOR RANGES (GENERAL)

1.1 INTRODUCTION

This Section, and the following Sections, contain information to be used for the design and construction of new ranges, the maintenance of existing ranges, the operating of shooting ranges, and the assessment of ranges for approval.

1.2 SITE LOCATION AND PHYSICAL LAYOUT

When selecting a site for a new range, it is important that the range be situated several kilometers from the nearest town or settlement, for safety reasons and noise reduction. *The most important feature is to lay out a range to fire in the safest direction possible.*

1.3 GENERAL STANDARDS

1.3.1 SIGNS:

Main sign: The range should have a large clearly visible main sign, indicating the name of the range and identifying the site as a shooting range.

Status sign: The range facility should have a clearly visible sign indicating the status of the range facility, whether in use or not. This sign should be located near the entrance of the range. (See Figure 1, page 4)

Perimeter signs: The perimeter of all outdoor ranges should be identified with appropriate signage, warning unauthorized persons not to enter (See Figure 2, page 5). Existing signs, as approved by the Chief Firearms Officer, may be used.

Signs should be spaced close enough so that a person could not walk through the boundary line without seeing a sign. In wooded or brush areas, the warning signs should be spaced at approximately 50 metre intervals or less. In open areas, they should be spaced at approximately 75 metre intervals.

1.3.2 FIRING LINE WARNING AND CONTROL DEVICES

One of the following warning and/or control devices; flags, beacons or audible devices must be used to control activities at the firing line and to warn people approaching that firing is in progress. If the range has more than one facility, each range should have one. Devices should be clearly visible and/or audible to those approaching and to those using the firing line.

Flags: Warning flags may be used to inform and control the range use. The color of the flags shall be **Red** (range in use and firing in progress) and **Green** (range not in use and firearms are cleared). The size of the flags should be a minimum of 1 x 0.5 metre, the ideal being 2 x 1 metre installed on a flagstaff approximately 6 metres high.

Beacons: Warning beacons may be used to inform and control range use. Beacons may be rotating or flashing colored lights, **red** (range in use and firing in progress), **green** (range not in use and firearms are clear).

Audible Devices: It should be noted that certain range(s) in the Province have been using audible devices, producing a sound of 80 decibels or more, and activated if there are people at the firing line and the range is not clear. This has proven to be an effective way of control. No firing occurs when that audible device is on. When turned off, firing can resume upon range officer's command. This method of control is acceptable, but does not warn people approaching, that firing is in progress. If that method of control is used, one of the warning methods, either flags or beacons should also be installed.

1.3.3 RANGE SAFETY RULES

Safety rules of each range facility must be posted. Rules shall be located behind the firing line, clearly visible to all users as they approach the range and shall contain:

- Type of range, firearms to be used (e.g. rifle, handgun, shotgun);
- Explanation of warning flags, beacons or audible devices used;
- Targets that are prohibited (e.g. glass);
- Prohibited ammunition (e.g. steel bullets, armor piercing or incendiary);
- Emergency phone numbers (e.g. police, ambulance);
- Basic safe range operating procedures, such as:
  - no alcoholic beverages or drugs allowed;

1.3.3 RANGE SAFETY RULES (Continued)

- never shoot more than one at a time unless a range officer is present;
- eye and ear protection is compulsory;
- make sure the gun is unloaded and open if approaching the firing line;
- never point or sweep a gun at people;
- only load gun at firing line, when range is clear, red flag is raised/red beacon is on or told so by range officer;
- keep muzzle of gun pointed downrange at all times when loaded (not up or down), to prevent overshoot in case of unintentional discharge.

1.3.4. SAFETY AREA

To achieve the maximum distance traveled by bullets, the firearm has to be pointed upward at approximately a 30° angle. The same situation will occur if a ricochet departs at that same angle. This would happen if an unintentional discharge occurs or if someone fires on purpose. ***There is no provision in these guidelines for unacceptable random or wild firing.*** **Unintentional discharge rarely occurs, but sometimes happens.** ***To prevent over-shooting in such cases, shooters must be taught to keep the muzzle pointed downrange so if a discharge occurs, it is captured within the backstop.*** **This safety rule should be incorporated in the Range Safety Rules (Section 1.3.3). In order to prevent or minimize ricochets, special attention must be given to range floors (see Range Floor, Section 2.4). It should be noted that a bullet loses a high percentage of velocity upon first contact with a "well designed" range floor and if it does ricochet, it is generally lower than the angle of incidence.**

These Standards have been developed to contain all rounds within the firing boundary range, between the firing line and backstop. Should ranges meet this design and use Standards, no rounds will leave the active range area, eliminating the need to use safety templates. Field firing ranges (Section 10) are the exception.

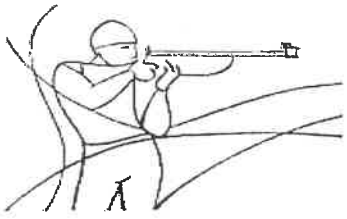
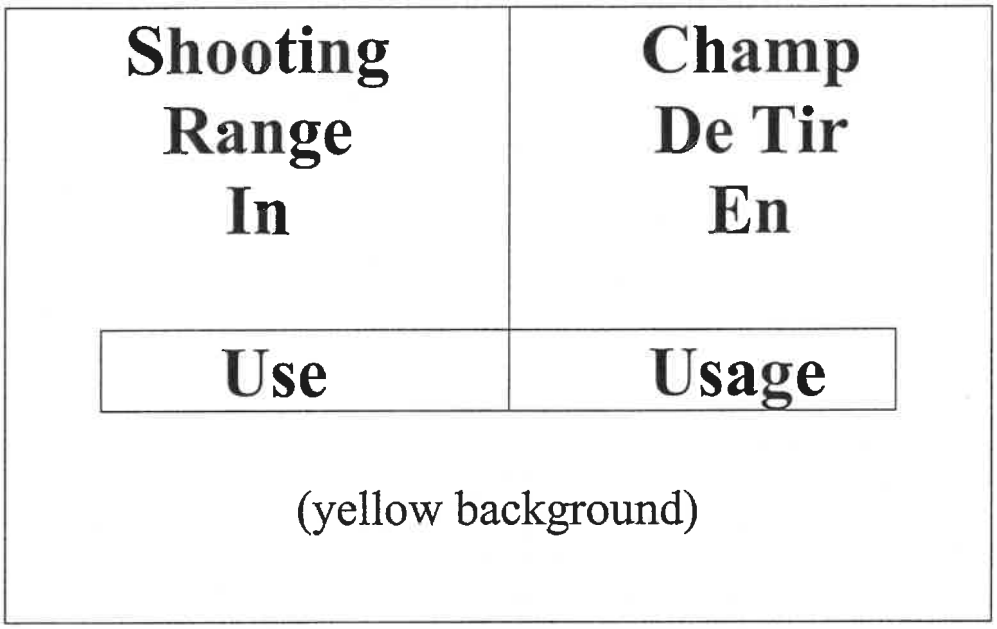
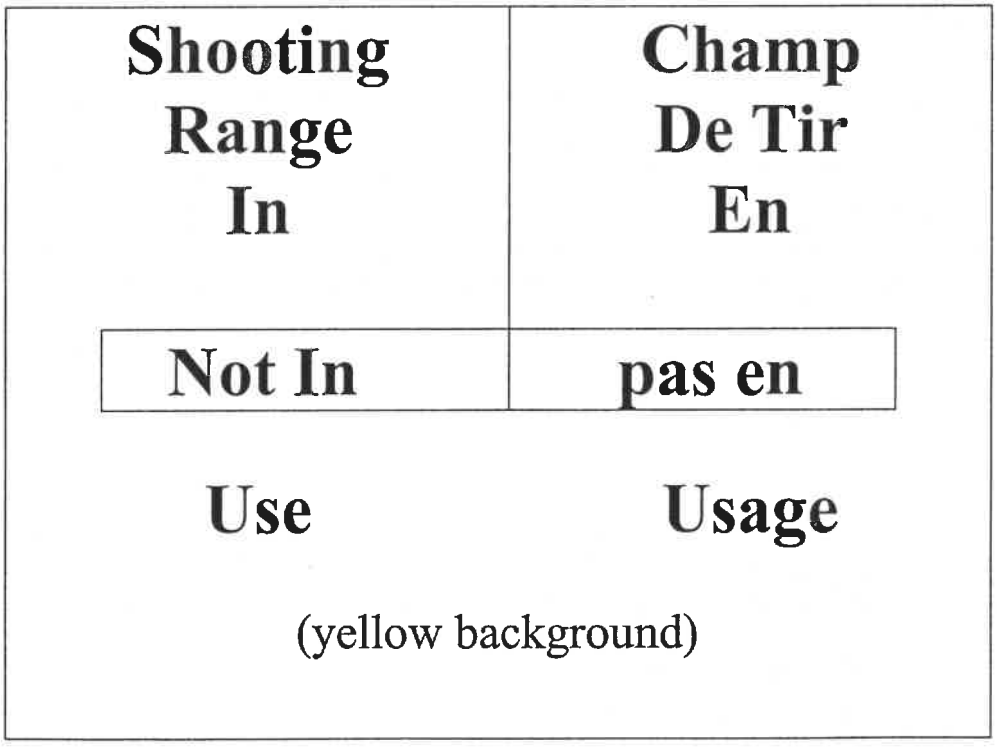


Figure 1: Status Sign (48 in. x 31 in., black text 2.8 in)





May be purchased at the Chief Provincial Firearms Office at cost. (1-800-731-4000 ext. 6000)

Figure 2: Perimeter Sign

Sign 12 x 16 in.

Shooting Range

(yellow background)

(yellow background)

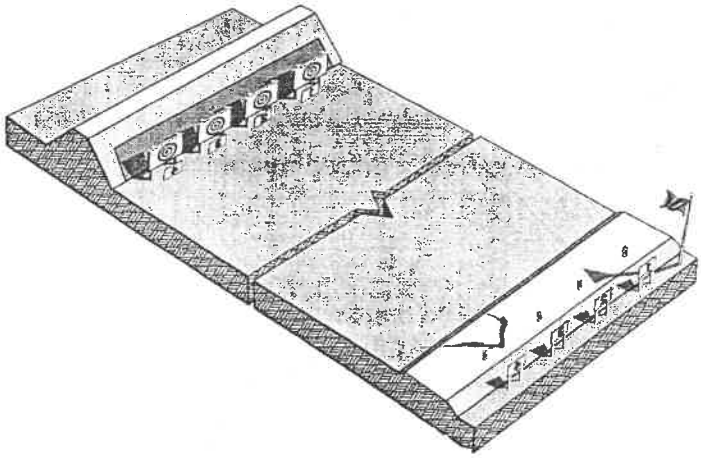
Champ de Tir

May be purchased at Chief Provincial Firearms Office at cost. (1-800-731-4000 ext. 6000)

SECTION 2
OUTDOOR (STANDARD) RIFLE RANGES

2.1 INTRODUCTION

Outdoor rifle ranges in New Brunswick excluding military ranges, are used by hunters and shooters for sighting in, practice or for target shooting. This Section applies to standard outdoor ranges, having firing line(s), target area(s) and a suitable backstop. The following is a sample diagram of how a standard rifle range might be configured:



2.2 BACKSTOP DESIGN AND CONSTRUCTION

Backstops are designed to capture fired bullets and lowflight ricochets (to minimize or eliminate ricochets, see Section 2.4, Range Floors). **All standard rifle ranges must have a backstop.** A backstop consists of a raised mound of earth behind the target(s). ***The backstop is the most critical safety feature of any outdoor range.***

The following should be considered when designing a backstop. A centerline is a straight line from the muzzle to the center of the target. On all sides of that centerline (up, down, left, right, 360°) there is a 1° sector, forming a cone of fire. That 1° sector accommodates the dispersion, wobble or a barrel whip, that may occur when a shooter is firing downrange. (See Figure 3, page 10)

2.2.1 BACKSTOP HEIGHT

The backstop height is measured vertically from the crest to where the range floor meets the backstop base. The required height of the backstop is determined by the firing distance.

Table 1 contains the minimum backstop heights and flank extensions relative to the intended firing distances:

Firing Distances	Min. Backstop Height	Min. Flank Extension
25m or less	3.0 m.	1.0 m..
50 m.	4.0 m.	2.0 m.
75 m.	5.0 m.	3.0 m.
100 – 200	6.0 m.	4.0 m.
300 m. or more	7.0 m.	5.0 m.

Table 1: Minimum Rifle Range Backstop Heights and Flank Extensions

When building or maintaining a backstop, it is recommended to exceed the minimum height as it will settle due to shooting activities and weather conditions.

2.2.2 BACKSTOP CREST

The thickness of the backstop at the required minimum height is 1.0 m.

2.2.3 BACKSTOP SLOPES

Fro. 30°

The face of the backstop should be built with an incline of at least 35° to minimize ricochets. A slope of 45° or more would be ideal. The forward face of the backstop must be free of rocks or other hard material to prevent ricochets or backsplash.

2.2.4 DISTANCE BETWEEN TARGETS AND BACKSTOP

Targets should be placed as near as possible to the backstop. However, this does not mean that targets cannot be placed forward, as long as the shooter's line of fire is directed to the backstop and the cone of fire is captured within the backstop.

2.3 FIRING LINES

A firing line is where one or more individuals engage their targets. The firing line should be elevated above the range floor (0.5 to 1 metre) and slightly sloped backward, keeping the firing line dry and improving the visibility of the targets. It should be parallel to the target line. The recommended depth of the firing line should be from 3 to 3.5 meters to accommodate the shooters and permit the range officer to move freely behind the shooters. The space between bench rests or shooting points should be approximately 1.5 metres.

2.4 RANGE FLOOR

The range floor is the space between the firing line and the backstop. It should be sloped slightly downward to keep surface dry and help direct ricochets into the backstop. The surface of the floor must be free of obstructions, any large exposed rocks or puddles of water. The range floor area where bullets might hit the ground (see Figure 3, page 10) should be of either sandy material or topsoil where grass can grow. A gravel surface, if the size of the individual gravel does not exceed 1 inch, is also acceptable.

These types of surfaces would prevent ricochets, or at worst, the ricochet would go up at an angle similar to its contact with the range floor, staying well within the backstop. The same would apply for cement floors of existing ranges.

2.5 BERMS

A berm is a raised mound associated to a backstop. Berms are not a necessity to a range. They are usually used to reduce the likelihood of an errant shot from escaping into an adjacent area, to reduce noise or to separate adjacent ranges.

If sideberms are used to shelter an area where people or equipment are likely to be used or to separate adjacent ranges, it shall have a minimum height of 2.5m, a minimum slope of 35° and a crest thickness of at least 1.0 metre at the required minimum height. If used to separate adjacent ranges, it must join at least one backstop.

2.6 TARGET HOLDERS AND BACKERS

To reduce the probability of bullet ricochets, it is recommended that the target holders be made of low ricochet materials such as wood or plastic, and not be constructed of unsheltered metal members. However, metal fittings or nails can be used.

The target backers should be made of soft material such as Coroplast, KB board, heavy cardboard or plywood. The following is an example of how a movable target holder can be built:

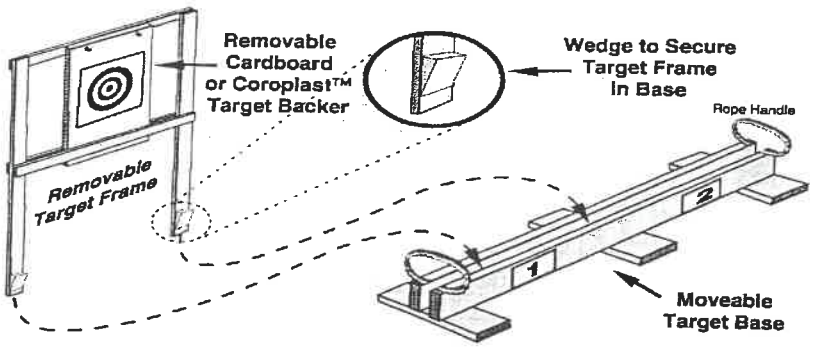


Figure 3: Cone of Fire and the 1° Wobble Effect

Figure 3: The range floor between the first point of impact and the backstop would be considered the ricochet area, depending on the height of the firing line and the firing point, so that section of the range floor should be in compliance with Section 2.4 of these Standards. At a 100 metres 1° would give a cone of 1.746 meters on all sides of the firing line; at 200 meters, it would give a cone of 3.491 metres and at 300 metres, it would give a cone of 5.237 meters on all sides. To that height you would have to add the height of the target.

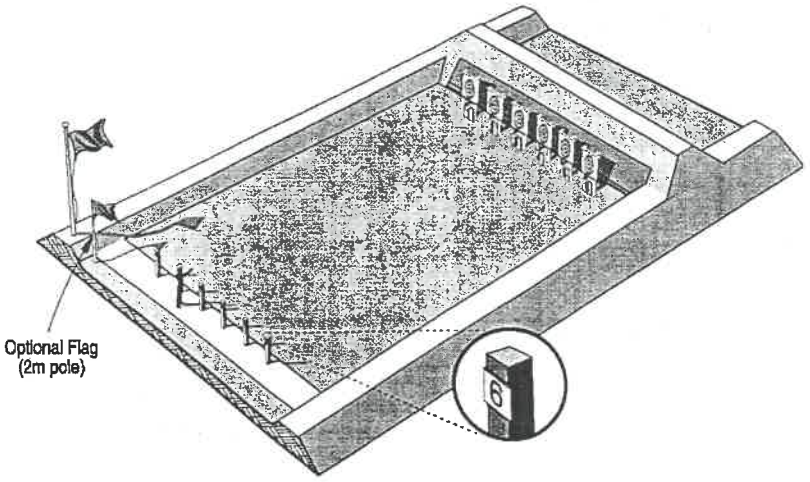
(Example: At 300 metres, if the centre of the target was 1.5 metres high and the cone at 5.237 metres on all sides, giving a total of 6.73 metres, then the backstop would have to be a minimum of 7 metres high.)

SECTION 3
OUTDOOR (STANDARD) HANDGUN RANGES

3.1 INTRODUCTION

A handgun range may have different configurations, depending on the shooting activities of the range. These ranges also have a firing line(s), a target area and a suitable backstop. Handgun ranges may be configured to have traditional firing lines, as used for ISU-style shooting or configured to have an active area for IPSC-style handgun shooting. The requirements of this Section apply to both styles of shooting.

The following is an example of a standard handgun range with side berms:



3.2 BACKSTOP DESIGN AND CONSTRUCTION

Except as follows, the requirements in this Section are in accordance with Section 2.2 of these Standards:

The following should be considered when designing a backstop for a handgun range: A line of fire is a straight line from the muzzle of the handgun to the center of the target. On all sides of the centerline (up, down, left, right, 360°), you have a 5° sector, forming a cone of fire. That 5° sector accommodates the dispersion, wobble or barrel whip that may occur when a shooter is firing downrange. (See Figure 4, page 13).

3.2 BACKSTOP DESIGN AND CONSTRUCTION (CONTINUED)

The line of fire from the muzzle through the target should be perpendicular to the backstop, especially important for IPSC style shooting.

3.2.1 BACKSTOP HEIGHT AND FLANK EXTENSION

Due to the cone of fire for handgun shooting, it might not be feasible to attempt to fully confine the cone to the backstop at all distances especially at 50 metres or more. To fully contain the bullets in the cone of fire at 50 metres, the backstop would have to be at least 6 metres high.

Table 2 contains the minimum backstop heights and flank extensions relative to the intended firing distances for handguns:

Firing Distance	Min. Backstop Heights	Min. Flank Extension
15metreor less	3 m	1.5 m
25 m	4 m	2.5 m
50 m	6 m	4.5 m

Table 2: Minimum Handgun Range Backstop Height and Flank Extension (to fully contain bullets in range)

3.2.2 BACKSTOP CREST

The required thickness of the backstop crest at the required minimum height is 1.0 m.

3.3 FIRING LINES

The firing line at the 7 metres, 15 metres, 25metres and 50 metres should be marked. The space between the shooters should be 1.0 metre if standing, 1.5 metres if kneeling and 2.0 metres if prone.

3.4 RANGE FLOOR

In accordance with Section 2.4 of these guidelines (Also see Figure 4,page 13).

3.5 BERMS

In accordance with Section 2.5 of these Guidelines.

3.6 TARGET HOLDERS AND BACKERS

In accordance with Section 2.6 of these guidelines.

Figure 4: Handgun Cone of Fire and the 5° Wobble Effect

The range floor between the first point of impact and the backstop would be considered the ricochet area, depending on the height of the firing point, so that section of the range floor should be in compliance with Section 2.4 of these guidelines. At 25 metres, a 5° cone would give a cone of 2.15 metres on all sides of the firing point; at 50 metres, it would give a cone of 4.35 meters on all sides. To that height, you would have to add the height of the target. (Example: 50 metres, if the firing point was 1.5 meters high and the cone 4.35 metres on all sides, giving a total of 5.85 metres, then the backstop would have to be a minimum of 6 metres, the ideal being 7 metres high.)

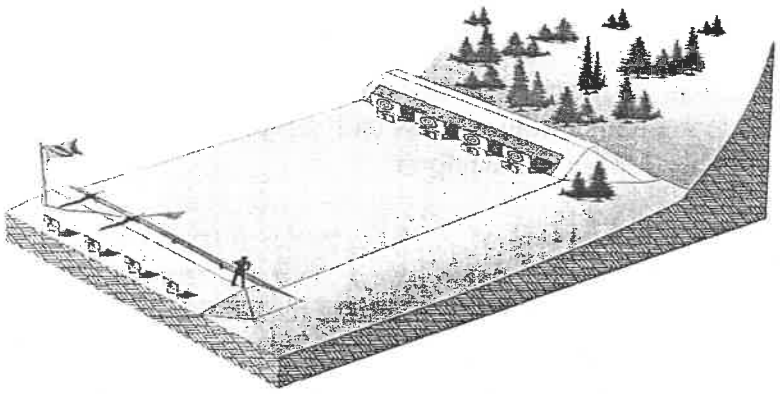
Note: The average height of a shooter standing is 1.5 meters, kneeling is 0.8 metres and prone 0.3 metres. Prone position is the most likely to create an overshoot. Prone position will not create an overshoot at 2.5 metres if the firing point on the target is 1.25 metres or less, the backstop being 4 metres high. At 50 metres, prone position, the firing point on target would have to be 1.25 metres or less, not to create an overshoot, the backstop being 6 metres height.

SECTION 4
NO SAFETY AREA RANGES

4.1 INTRODUCTION

No Safety Area (NSA) ranges are outdoor rifle or handgun ranges that are built with the direction of fire into an imposing topographic feature (e.g. a mountain, hill, ravine, etc.). The downrange safety area is generally defined as a specific elevation on the topographic feature.

The following is an example of what an NSA range could look like.



Due to their nature each NSA range shall be designed or assessed on an individual basis.

No calibre specific considerations are involved in NSA range design and assessment; however, the type of firearm used on the range, rifle vs. handgun, is an important factor.

It is not practical, or cost effective to construct a NSA range at a site that does not have an existing topographical feature such as a hill, mountain, or ravine. Construction of a standard rifle and/or handgun range (as per Sections 2 and 3) would be recommended.

4.2 TOPOGRAPHIC FEATURE CHARACTERISTICS

These Standards assume that an imposing topographic feature is present behind the targets, and must be of such construction (e.g. slope and construction), that is capable of capturing all overshoot and all ricochets generated on the range in the course of normal use.

The slope of the forward face of the topographic feature where the impact occurs is an important design and assessment of NSA ranges. The lowest acceptable slope anywhere within the required height and width on the forward face is 30°. The steeper the slope on the topographic feature face, the better, as it will capture direct shots and ricochets. All things held equal, the steeper sloped forward face will require less overall height than a more shallow slope (the steeper slope intersects escaping bullet trajectories sooner in their upward flight.

The forward face of the topographic feature, within the required height and width, shall be free of major exposed rocks outcropping or other hard ricochet producing surfaces.

4.3 OTHER REQUIREMENTS

All the Standards in Sections 1, 2 and 3 apply to RSA range, with the exception of Section 2.2 - Backstop. It must be noted that the topographic feature becomes the backstop. But that topographic feature must still meet most requirements of Table 1., page 14 (rifle) and Table 2, page 11 (handgun).

Although optional, a small backstop of 2.5 to 3 metres high could add extra safety and this feature will aid with range maintenance such as removal of lead and slope maintenance. If present, backstop should satisfy the requirements of Section 2.2, with the exception of Section 2.2.1 referring to backstop height.

SECTION 5
OUTDOOR GALLERY RIFLE RANGES

5.1 INTRODUCTION

Gallery ranges are often used for long range (beyond 200 m) rifle shooting. Due to the extended distances between the shooters and their targets, outdoor gallery ranges are designed to use target marking systems in the downrange area, which can be manual, electronic or both. (See Figure 5, page 20 for an example of a Gallery Range)

All guidelines and Construction Designs of Sections 1, 2 and 3 apply to this type of range. In addition to Section 1.3.2, control devices should be installed at the gallery, to indicate when that area of the range is clear for firing.

Gallery rifle ranges may be configured to have firing areas instead of firing lines. If configured in such a way, the perimeter of the firing area shall be marked with pylons, posts or similar symbols. Those markers should be clearly visible to shooters and Range Officers and are intended to assist range users in identifying the firing areas of the range.

5.2 SAFETY CONSIDERATIONS

The protection of any personnel (e.g. markers) in the downrange sheltered gallery is one of the key safety considerations of this type of range. The markers must be protected from hazards posed by direct bullet impact, bullet ricochets and backsplash from backstop.

5.3 TARGET MARKERS GALLERY

The use of manual target marking on this type of range requires that the target markers be in close proximity to the target to do their job. The purpose of the gallery is to shelter target markers from the firing being conducted on the range (Figure 6, page 21, as example). The design and construction of the gallery shall be such that, the markers can conduct their duties in the gallery without being exposed to hazardous fire or ricochets. The target markers' gallery is usually composed of a mantlet, gallery, target carriers and protective wall.

5.3 TARGET MARKERS GALLERY (CONTINUED)

Mantlet: The mantlet is an earthen berm banked up against the gallery, designed to capture low shots and low ricochets. It is constructed of any solid material such as soil (similar to backstop or berms, including the recommended slope). The minimum thickness of the mantlet over the gallery construction shall be at least 1.5 m. It is recommended that the mantlet crest be imbedded with timbers (2x10 in. minimum) to prevent tunneling and erosion from low grazing shots. It is also recommended that the mantlet crest be approximately 1.8 metres above ground level. The mantlet top and gallery roof should be sloped downward by about 5° to allow drainage and prevent damage to slope of mantlet.

The mantlet should not hide targets, which should be clearly visible from all positions, leaving a gap of about 10 cm. from top of mantlet.

Gallery construction: The gallery provides a sheltered safety area for markers and also an area to house target mechanisms (target carriers) used to raise and lower targets for marking.

There are a number of designs and materials used in construction of gallery. Poured concrete or prefabricated concrete is commonly used techniques, being of durable structure, providing uninterrupted protection from bullets. Other alternate construction techniques can be used, such as bricks, corrugated steel or rock filled gabions.

Regardless of the techniques used, the gallery shall be designed to maintain its integrity against all structural loads. In case of doubt to structural stability the CFO can ask for a report of a Professional Engineer attesting the structural suitability of the gallery design.

The design of the gallery roof shall provide at least 1metre of overhead cover for the markers area. The gallery should have a working area on at least 2 metres wide. It should be as parallel as possible to the firing lines and the backstop.

Protected Barrier: If the gallery is within 25 metres of the base of the backstop, a wall barrier made of timber (5 cm thick), concrete, brick or steel should protect the markers from bullet backsplash. An earthen berm can also be used. The protective barrier shall run the entire length of the gallery and shall rise to cover its height.

Target Carriers: Gallery Ranges are equipped with moveable target carriers, located in the gallery. They are used to raise targets above the mantlet to be shot at and then lowered to be marked without exposing the marker to rifle fire or ricochets.

5.4 ELECTRONIC TARGET MARKING EQUIPMENT GALLERY

There are a number of acceptable target carriers (See Figure 7, page 22 for examples). The prime consideration is that the target can completely be raised or lowered without exposing the markers, and that no metal components are exposed to bullet fire. This requirement is not applicable to electronic target systems, if personnel are not present downrange.

If a range uses exclusively electronic marking equipment, having no personnel in the downrange area, then the gallery requirement of Section 5.3 does not apply. The following does apply:

Mantlet: To reduce the occurrence of ricochet, it is recommended that the electronic targetry be placed on top a 1.8 metres high mantlet, constructed in accordance with the applicable requirements of Section 5.3 - Mantlet. If the electronic targetry is part of a mobile trailer-based system placed behind the mantlet, then the mantlet should shelter the trailer to prevent damage.

Figure 5 – Gallery Range

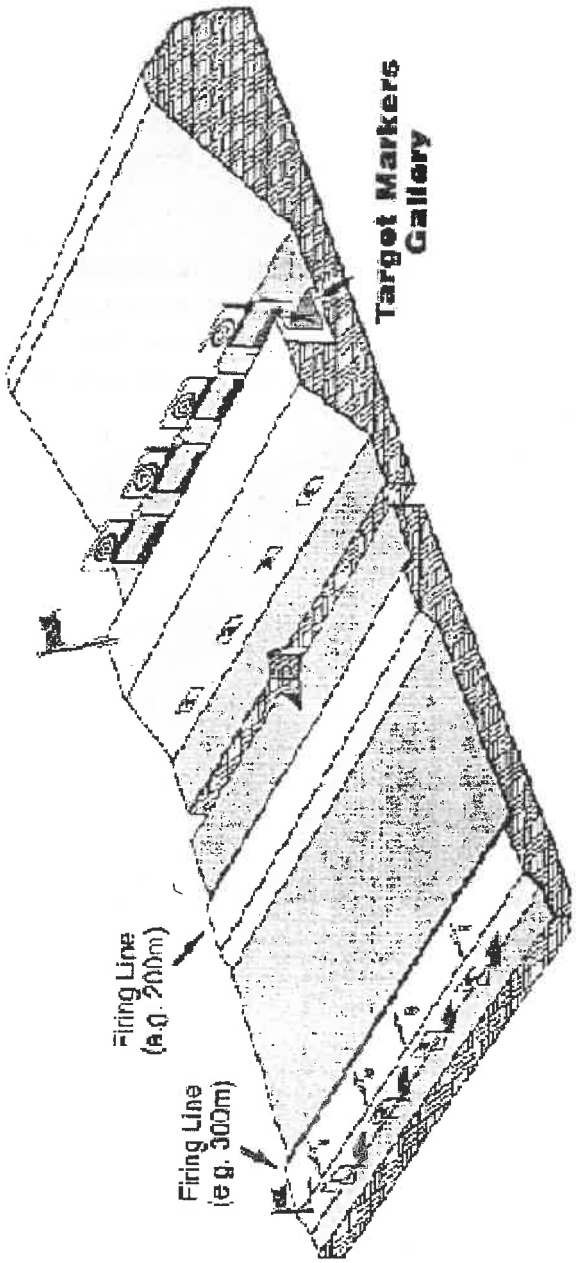


Figure 6 – Target Markers Gallery

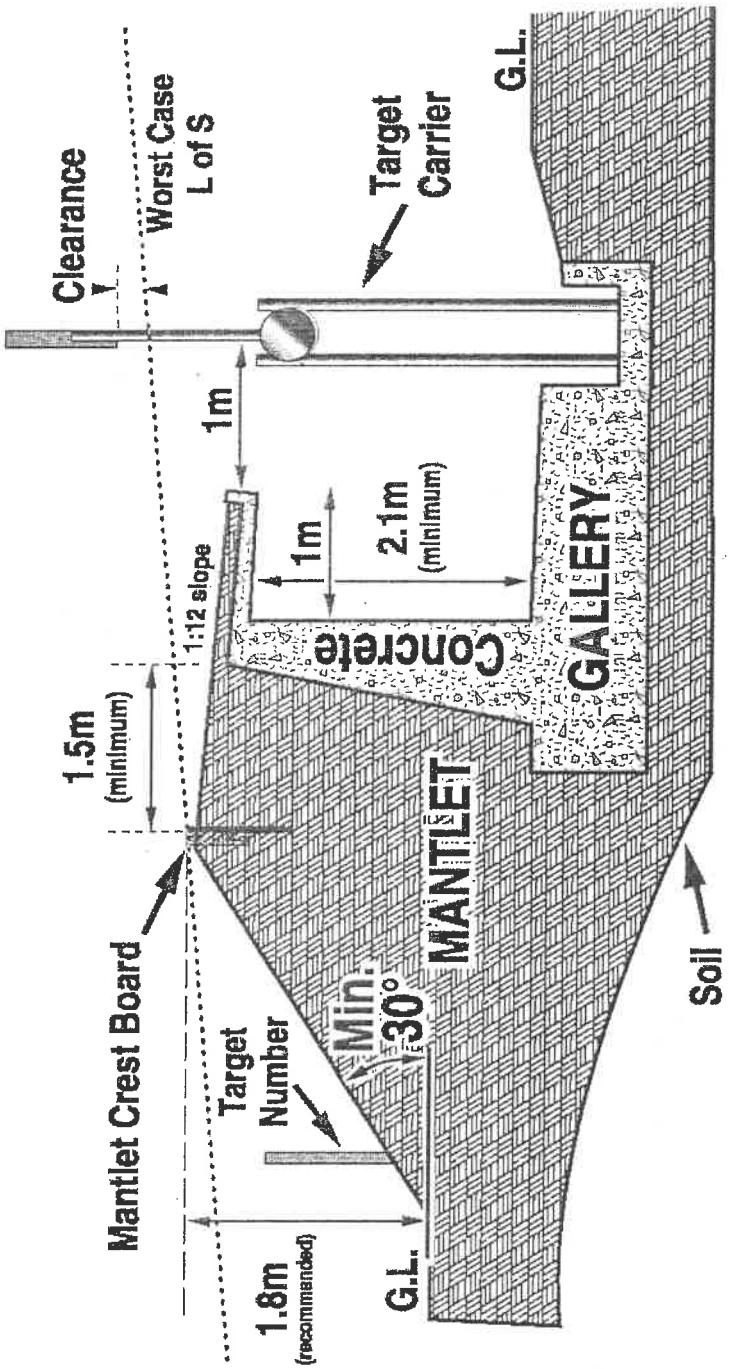
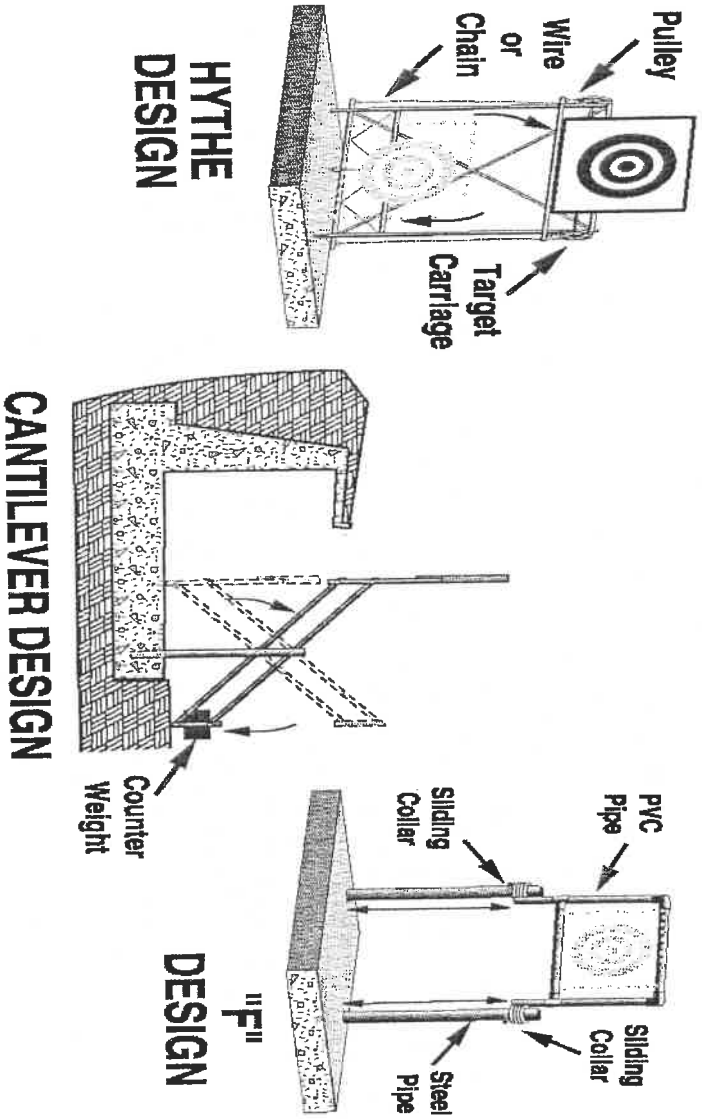


Figure 7: Target Carrier Designs



SECTION 6
TRAPSHOOTING AND SKEET RANGES

6.1 INTRODUCTION

Trapshooting and Skeet Ranges have mechanical mechanisms (traps) to throw frangible targets (clay targets) and an arrangement of shooting stations from which shooters engage these targets. The targets are thrown on fixed flight paths or within prescribed arcs.

The Amateur Trapshooting Association (ATA) and National Skeet Shooting Association (NSSA), as sport governing bodies, publish rules and facility requirements for Trapshooting and Skeet Shooting, which will supply more application specific and detailed construction information than will this Section. This Section is primarily concerned with safety issues and will not address in detail the regulatory issues relevant to the sport.

Some ranges in the Province might have different configurations than those stated, but this should not be taken into account for range approval, as long as the safety considerations are respected.

6.2 SAFETY CONSIDERATIONS

These types of ranges require a downrange safety area that is able to contain the fired shots produced through normal range use. The range safety area will be a minimum of 200 metres, from the point of firearms' discharge when using 7½ or smaller shots. Human activity should not be permitted within the safety area when a shotgun range is in operation.

A range may combine Trapshooting and Skeet Fields in one layout. If so, the range will be assessed for both disciplines.

6.3 RANGE LAYOUT

6.3.1 ACTIVE RANGE AREA

The active range area for Skeet and Trapshooting fields includes the area of the shooting stations and trap houses. It includes the area forward of the shooting stations to a depth

6.3.1. ACTIVE RANGE AREA (continued)

equivalent to the flight distance of the thrown targets, which is approximately 65 metres. This area should be relatively level and free of tall brush, trees or major obstructions.

6.3.2 SKEET RANGE

Range Configuration: A skeet field has two houses, a " high" and a "low " house from which targets are thrown. These houses are located at either end of a segment of a circle, which has a radius of 19.2 metres. Seven shooting stations are located on this circle segment. An eight shooting station is situated in the center of the field, midway between the *high* and *low* houses. (See Figure 8, page 28 as example of skeet range)

Skeet Houses: Skeet Houses are located on opposite sides of the skeet field. The *high* house is at the left end and the *low* house is at the right end, separated by approximately 38.8metres (Refer to Figure 9, page 29). These structures house the target throwing mechanisms (manual or self-loading) and target supply, if so desired. These should be off-white colors in order that thrown targets may be readily seen by shooters.

Skeet houses that require human operators should be built to protect the operator. The side and back walls of the sheet house shall be pellet proof. Wooden construction shall be overlaid with two overlapped layers of 5 cm. thick planking. If the construction is concrete or cinder blocks, no additional protection is required. The trap operator must not be visible from any of the firing stations, in order not to be exposed to pellets fired. Excluding the door and the opening through which the skeet are thrown, there shall be no windows or opening on the exposed sides of firing.

A warning to the operator should be posted inside the operator's area instructing:
- not to look out the skeet chute when the range is operating;
- not to reach into the skeet chute when the range is operating;
- not to leave the sheltered operator's area of the skeet house until given permission by the Range Officer.

Manually operated skeet house shall be equipped with a yellow flag mounted to a short pole. This flag is intended for use by the operator to signal the Range Officer and shooters when shooting must be stopped (e.g. trap breakdown, out of target supply or other valid reasons).

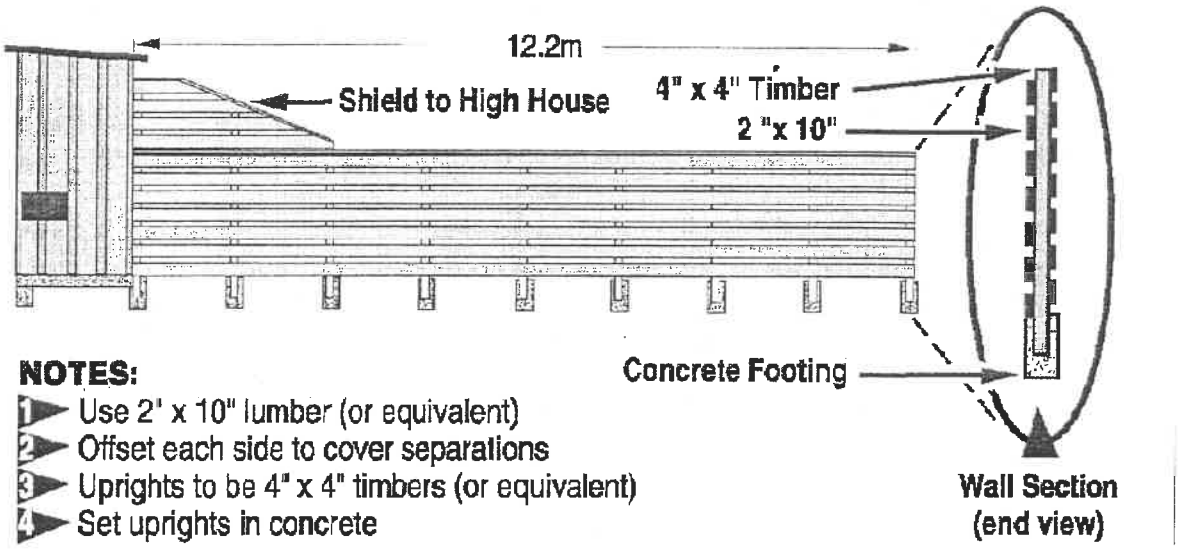
Shooting Stations: The shooting stations must be clearly marked, level and provide firm footing for the shooters under all conditions. The use of gravel, asphalt or concrete pads is recommended. The arrangement of the shooting stations is shown in Figure 8, page 28.

6.3.2 SKEET RANGE (continued)

Skeet Targets Mechanisms: The target throwing mechanisms shall be functional and capable of throwing the targets reliably on the intended flight path. Maintaining consistency of direction and height is an important consideration. To assist in verifying target flight, a stake or post should mark the crossing point for targets thrown from the *high* and *low* houses. This stake should be located approximately 5.5 metres forward of station no. 8. The traps should be adjusted to obtain target flight paths in accordance with the sport governing body's rules.

The shooting boundaries should be marked with posts or stakes placed at 40.25 metres from each skeet house. The distance is measured in a straight line from each skeet house through the crossing point.

Barrier Wall – Adjacent Skeet Ranges: If two or more adjoining skeet fields, shall be separated by a barrier wall. This wall is intended to protect shooters on adjoining ranges from errant targets and misdirected shot. The barrier wall and construction requirements shall meet or exceed the following:



6.3.3 TRAPSHOOTING RANGES

Range Configuration: A trap range has one trap house located center field from five firing points (posts) located a minimum of 14.6 metres to a maximum of 24.7 metres from the trap house.

6.3.3. TRAPSHOOTING RANGES

Trap Houses: The trap house consist of a structure measuring 2.3 to 2.6 metres in length and 2.3 to 2.6 metres in width. The height will not be less than .7 metre and not more than .9 metre, the height to be measured from the plane of the number three firing point.

Firing points shall be 2.7 metres apart on the circumference of a circle whose radius is 14.6 metres. All shooting points shall be on the same level. Shooting station (post) three shall be aligned at the midpoint (B) at the trap house.

Amateur Trapshooting Association (A.T.A.), the U.S.A. based governing body rules for the flight of legal targets. All singles targets shall be thrown not less than 44 metres nor more than 47 metres and doubles targets shall be thrown not less than 40 metres not more than 47 metres.

Trap Machine: A trap machine, which throws targets at an unknown angle shall be used. All trap machines used to throw A.T.A. Registered targets shall be manufactured or equipped as to interrupt irregularly the oscillation of the trap or otherwise assure the unpredictability of the flight of substantially all targets thrown.

Flights and Angles: Singles targets shall be thrown not less than 44 metres nor more that 47 metres. Doubles targets shall be thrown not less than 40 metres nor more than 47 metres; distance measurements are on level ground in still air. Targets, either singles or doubles shall be between 2.4 and 3.7 metres high when 9.0 metres from point B (centre front of trap house). The recommended height for targets is 2.7 metres.

In singles shooting, the trap is so adjusted that the right angle shall not be ore than 17.14° measured to the right of centre and not less than 17.14° measured to the left of the centre line. The combined angle of 34.28° shall also be maintained when throwing doubles target.

Additional target Allowance: A declared legal target shall be allowed if it is less than 25° outside the angles described (right and left).

Manually operated trap house shall be equipped with a yellow flag on a short pole. The flag is intended for use by the operator to signal the referee (Range Officer) and shooters when shooting must be stopped (e.g. Trap breakdown, out of target supply or other valid reason).

Shooting Stations: Shooting stations shall be level and located 2.7 metres apart on the circumference of a circle whose radius is 14.6 metres. Shooting Post #3 shall be midfield and carefully aligned at midpoint B at the traphouse. Shooting stations may be extended away from the traphouse from 14.6 metres to 24.7 metres thus providing shoot areas for those who earn yardage (handicap).

6.3.3. TRAPSHOOTING RANGES (CONTINUED)

Trap fields may be aligned in a row or at midpoints of adjoining skeet fields. While A.T.A. indicate the minimum trap field placement is 9.1 metres, normal trap field placement is 12.12 metres.

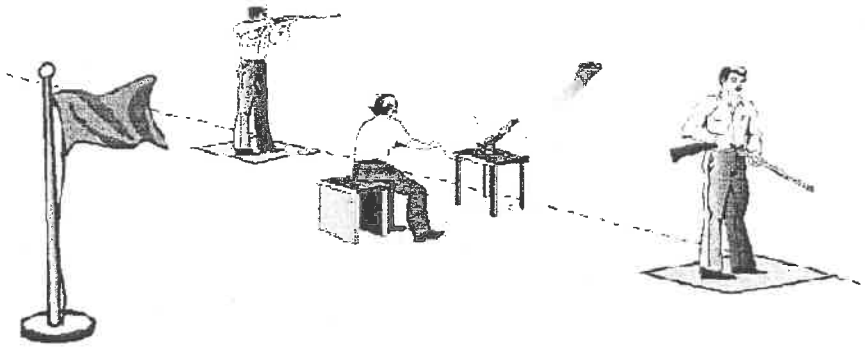
Safety Considerations: Trap ranges require a down-range safety area measured from the point of discharge. The range safety area will be a minimum of 200 metres when using 7 ½ size lead shot or smaller (3 dram equivalent of powder with 1 1/8 oz. shot). Note: 12 gauge shotguns are the norm in trap shooting.

Human activity should not be permitted within the safety area when a shotgun range is in operation.

A range may combine trapshooting and skeet fields in one layout; if so the range will be assess for both disciplines.

6.3.4 FIELD FIRING SKEET RANGE

Range Configuration: This type of *ad hoc* skeet range is very simple to construct and operate. It consists of manually powered or operated target thrower or mechanical trap and one or more shooting stations, as seen in the following:



Shooting Stations and Target Throwing Mechanisms
(As per the applicable Section of 6.3.2.)

6.4 SAFETY AREAS

Skeet: The Standard Skeet Range safety area templates are illustrated in Figure 9, page 29.

Trapshooting: The field firing clay target safety area for 7 ½ or smaller size shot is 200 metres. (Manual machines or hand held target throwers.) This is measured from the shooting station.

Field Firing: The field firing, skeet range safety template is illustrated in Figure 11, page 35.

Figure 8 – Typical Skeet Range Layout

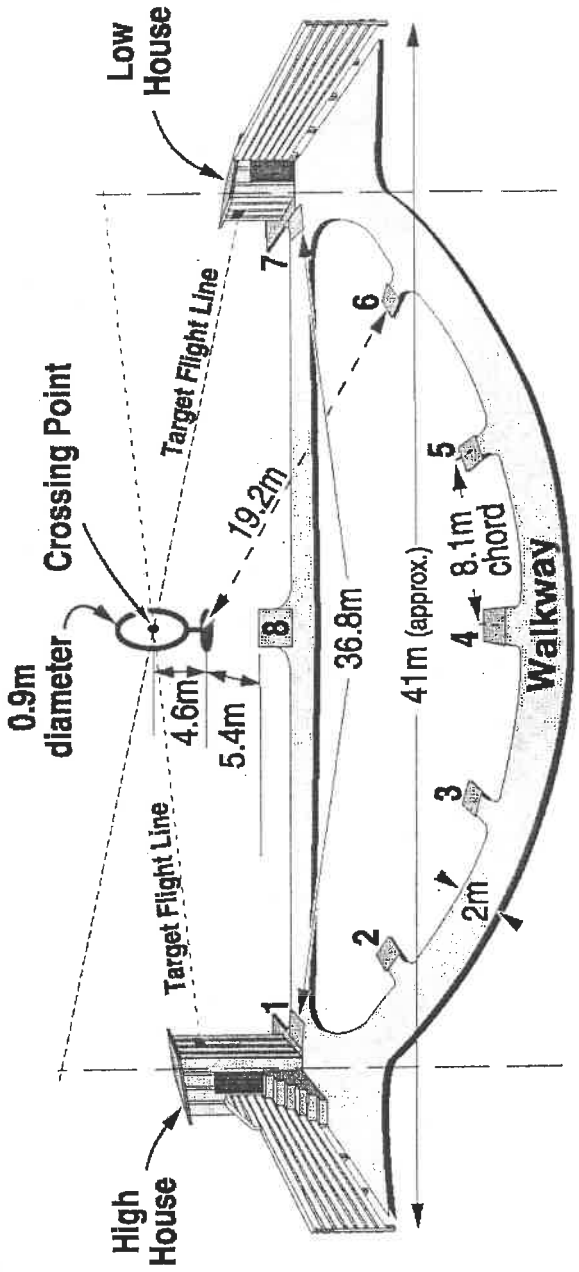


Figure 9 – Skeet Range Safety Area for No. 7.5 or smaller shot, minimum range (d) is 200 m. This is measured from the point of discharge, of the firearm at each of the shooting stations.

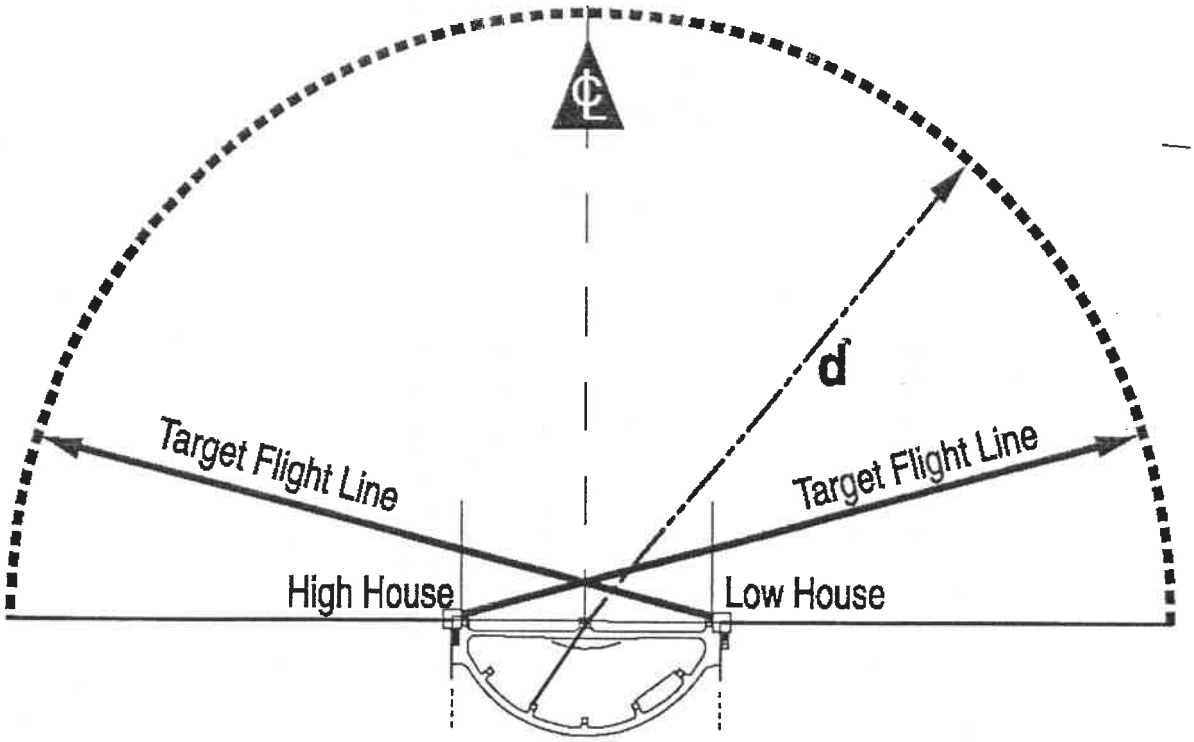
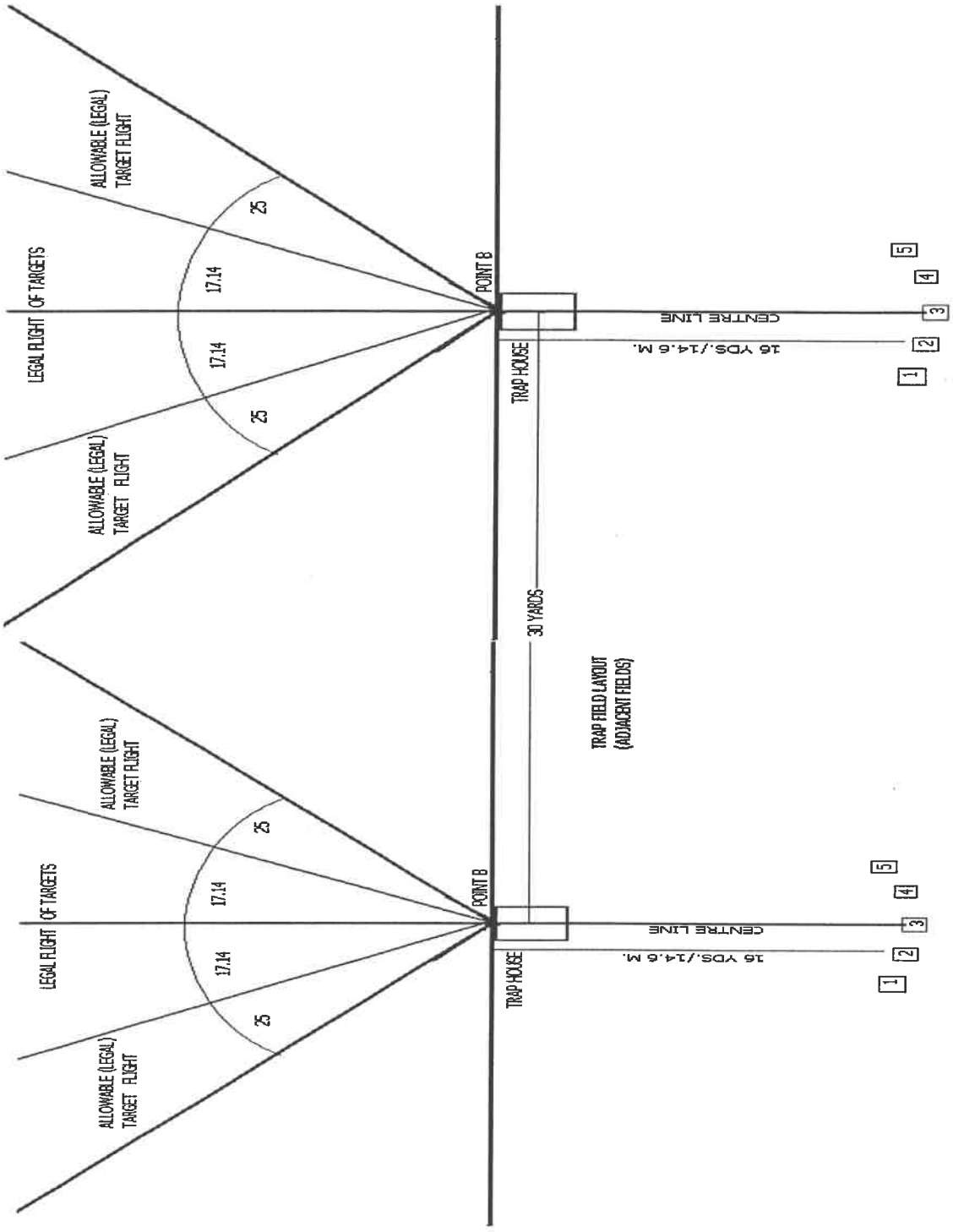


Figure 10: Trap Range Safety Area



SECTION 7

SPORTING CLAY RANGES

7.1 INTRODUCTION

Sporting clay ranges are established with different shooting scenarios, configured to simulate hunting type settings. A sporting clay range, consist of various shooting stations laid out in a circuit or configured around multi-station towers. Each station consists of a shooting position and a target thrower(s) designed to throw frangible targets on a specific flight path or within an intended arc.

There are sporting organizations that have established operating and facility construction rules, and should be consulted by range builders, as they will supply specific and detailed construction information. In areas that are not safety related and that pertain to regulatory sport governing rules, the requirements of the sport governing body can take precedence. This Section is concerned mostly with safety issues, which must be met, and will not address regulatory issues relevant to sport governing rules.

Some ranges in the Province might have different configurations, but this should not be taken into account for range approval, as long as the safety considerations are met.

7.2 SAFETY CONSIDERATIONS

In order not to make the safety area requirements prohibitive, the shooting conditions for each station must be determined and the safety area matched to those specific requirements. The range operator is required to maintain a site plan of the range area with the shooting stations and their safety zones clearly indicated. This site plan shall be displayed for users to see.

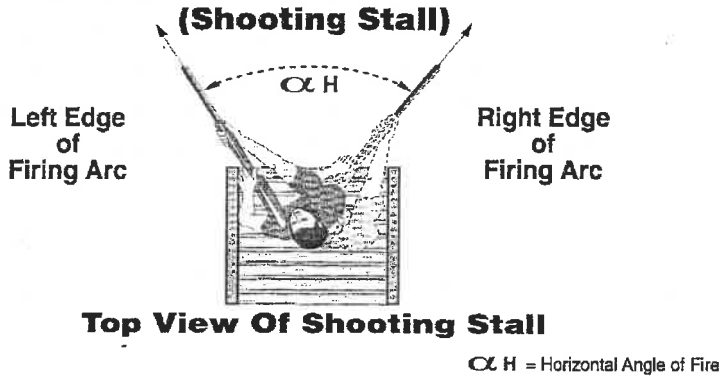
Human activity should not be approved within the safety area when a sporting clay range is in operation.

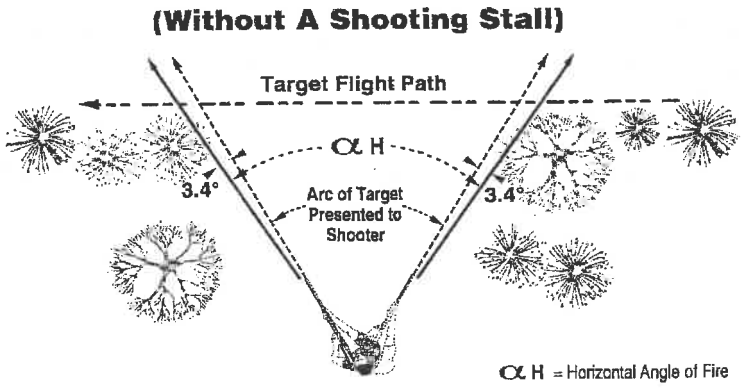
7.3 SAFETY AREAS

The safety area is based on the course-of-fire for each shooting station. The safety area is determined by, the distance the pellets will travel given the vertical angle of fire and flight path (generally determined by the shooting stall or stations). A medium vertical angle between 5° and 60° give the farthest range of the pellets, as will the largest pellet shots allowed. Figure 11, page 35, indicates the safety area distance of Sporting Clay Range, using medium vertical angle and number 7.5 to 9 size shots. If the safety area in Figure 11 do not match (or exceed) the intended use, contact the CFO for more information.

Range safety areas from any station must not overlap other shooting stations that are in use or areas likely to be frequented by people.

After applying the safety area distance in Figure 11, page 35, the following are examples of how a target flight path might be determined, with or without shooting stall, giving the horizontal angles of the safety area:





7.4 RANGE LAYOUT

The layout of a sporting clay range is flexible and user defined, provided that the requirements of this Section are met and that all range safety areas are confined to the land area formally or informally controlled by the Range Operator.

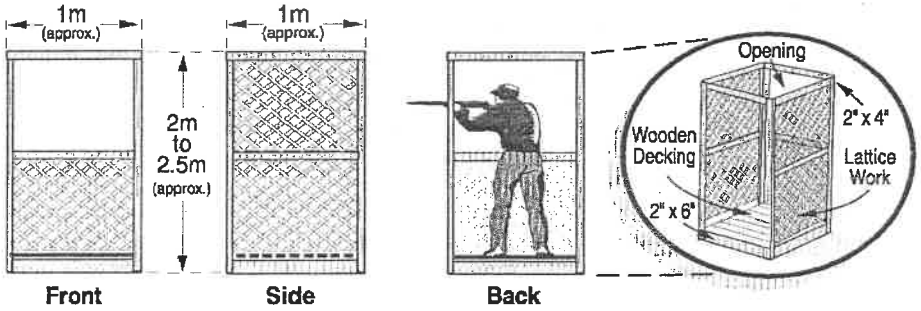
7.5 RANGE EQUIPMENT

7.5.1 SHOOTING STATIONS

There is a variety of shooting stations that can be utilized. The designs can be simply marked stations, shooting stalls or more elaborate scenario-based ones such as a duck boat simulation. Our intention is to provide guidance with regard to shooting stations. Each particular configuration will be individually assessed using discretion and a common sense approach.

Marked Shooting Station: The shooting stations shall be clearly identified with a number that can be related to the site plan, be marked as to the planned course-of-fire (e.g. 25 m. bounding rabbit) and provide firm footing under all weather conditions. The use of gravel, asphalt or concrete pads is recommended. The station should be approximately 1 m. x 1 m.

Shooting Stalls: The use of shooting stalls are encouraged, being an excellent method of restricting the shooter's horizontal and vertical angle of fire, thereby reducing the land area required for safety. The following is an example of a shooting stall:



Shooting stalls shall be of sturdy construction, properly situated to prevent wobble or tilt, and provide firm footing. It shall be identified with a reference number that can be related to the site plan and be clearly marked as to the planned course-of-fire.

7.5 RANGE EQUIPMENT (CONTINUED)

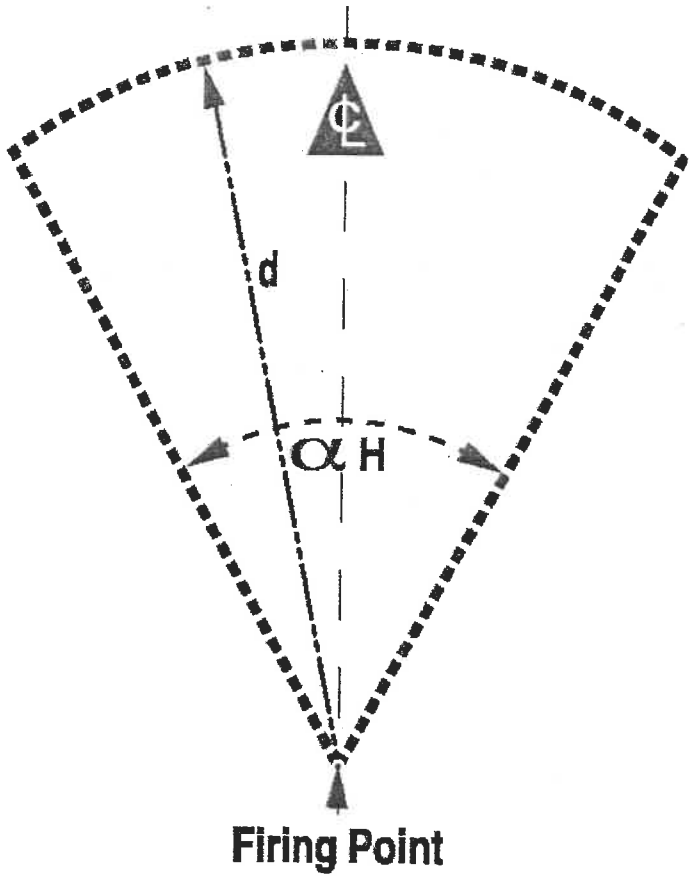
Scenario Shooting Stations: This style of shooting station is intended to simulate hunting situations (e.g. goose blind, floating duck boat) and may have an *intentional* degree of instability. Shooting station instability is acceptable as long as adequate safety provisions are in use to prevent unintentional discharge or misdirected shots. Scenario shooting stations shall meet the requirements of Shooting Stalls, and also have clearly defined safety procedures for the use of the station (e.g. when to enter, load, etc.).

Operator Protection: Whenever operators are *forward* of the shooting station when firing is conducted, they shall be adequately sheltered. If the operator is located outside the cone of fire, they shall be sheltered by two layers of overlapped 5 cm planking or other material of equivalent or greater protection. If the operator is within the cone of fire, he shall be sheltered by 10 cm of poured concrete or other materials of equivalent or greater protection. The *entire* operator's area shall be sheltered from shotgun fire. The operator's area shall have a sign cautioning to remain under cover until instructed by Range Officer. The operator's station shall be equipped with a yellow flag mounted on a short pole, to be used by the operator to signal the Range Officer and shooters when shooting must stop.

Figure 11 – Maximum Sporting Clay Safety Area

Note: using 7.5 – 9 size shots, with a vertical angle of fire from 5° to 60°, the angle giving the maximum rang (d), the distance is 200 m. Common sense should be used when applying safety areas for each shooting stations (e.g. 25 m. dashing rabbit, angle being less than 5°, the safety area for that station is considerably reduced. The same applies to station requiring shots at angles greater than 60°). See 7.3 for horizontal angle that should be applied.

αH = Horizontal Angle of Fire



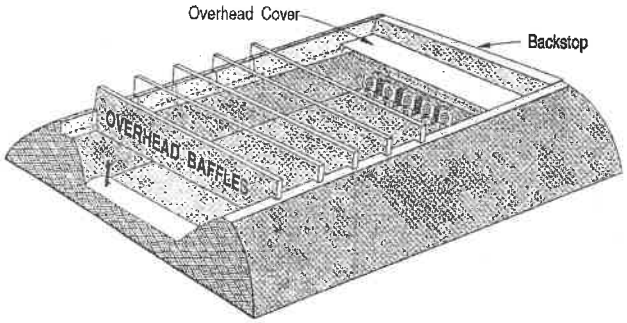
SECTION 8
BAFFLED RIFLE AND HANDGUN RANGES

8.1 INTRODUCTION

This Section pertains to rifle and handgun ranges that have a system of overhead baffles and side berms or baffles. A baffled range is designed to virtually contain all fired bullets and ricochets to the active range area in the course of normal range operations therefore not requiring a safety area.

There are differing requirements for baffled ranges that will be used for handgun only and those used for rifles *and* handguns. These differences arise from different penetration capabilities of the different calibre groups.

Baffled ranges are very costly to build and maintain. The baffles are not only exposed to firing but also to all types of weather conditions. Due to construction limitations and cost, it is generally not practical to baffle a rifle range for long distances (e.g. 200 metres, 300 metres or more) The following is an example of a baffled handgun range:



8.2 SAFETY CONSIDERATIONS

The absence of a safety area makes the complete containment of all shots and ricochets to the active range area the primary safety issue. As a result, diligent care must be taken on the design, construction, approval and operation of baffled ranges.

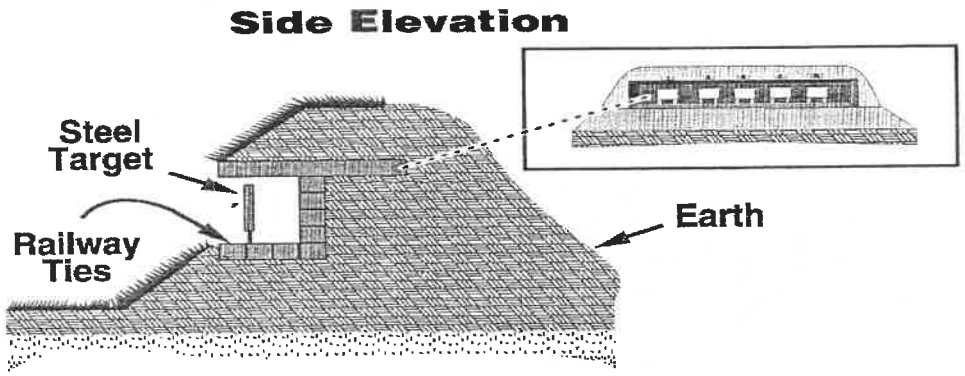
8.2 SAFETY CONSIDERATIONS (CONTINUED)

The course-of-fire planned for the range must be taken into account when designing and constructing a baffled range. Range safety, can be compromised by conducting courses-of-fire for which the range was not designed, therefore careful considerations and planning should be done before the construction. Range Operating Instructions and the planned courses of fire are important considerations for all baffled ranges.

For baffled ranges, steel or similar high ricochet surfaces in the active range area that are exposed to rifle or handgun firing (e.g. baffle support), pose an unacceptable ricochet risk. Those surfaces shall be clad in timber or other similar materials designed to contain or prevent ricochets or placed behind shelters designed to contain ricochets (e.g. berms).

If the use of steel targets is planned for a baffled range, care must be taken to ensure that ricochets from targets are contained within the range. This can be accomplished by sheltering the targets within revetments or within a structure designed to capture or direct all ricochets. *If unsheltered, steel targets cannot be used.* The following is an example of a steel target cover:

Must Have Cover around Steel Targets



If any doubt exist as to the penetration protection provided by any baffle system or construction, the CFO can ask that a Professional Engineer attest, that the planned baffle design and construction will *in all probability* prevent perforation by the occasional bullet impact from calibre's of ammunition and bullet natures that are *intended to be fired* on the range.

8.2 SAFETY CONSIDERATIONS (CONTINUED)

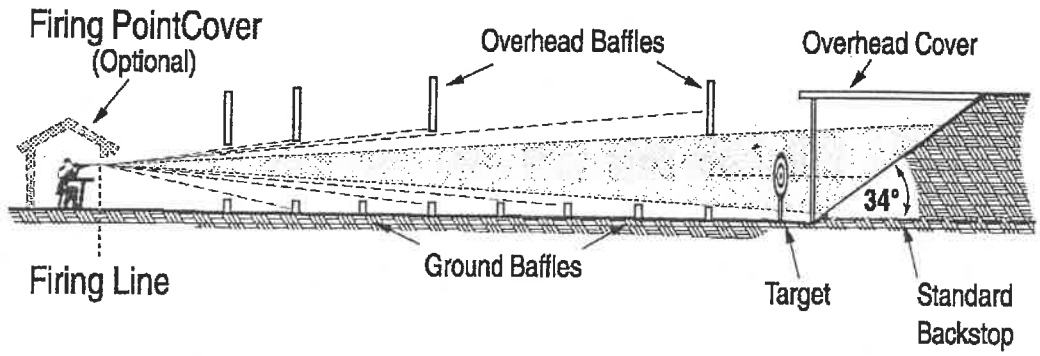
Cross-range firing at extreme angles dramatically increases the chance of bullets escaping from a typical baffled range. Therefore, it is good practice to ensure that the left and right deviation of the arc of fire is constrained (1° for rifle, 5° for handgun).

8.3 RANGE LAYOUT

There are two basic designs for baffled ranges Type I and Type II; these types, are primarily differentiated by the presence, or absence of ground baffles and the configuration of the overhead baffles. On the following page, you will find examples of both types. The first example is of Type I, with ground baffles, needing less overhead baffles, since the are no ricochets from range floor. The second is of Type II, with no ground baffles, needing more overhead baffles to capture ricochets from range floor.

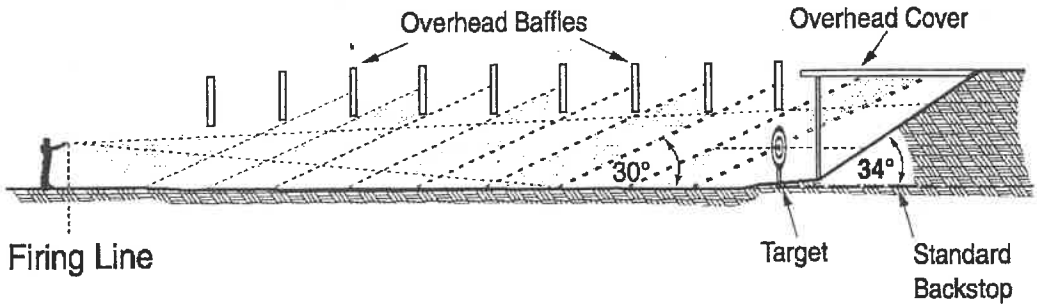
Type I - Baffled Range:

Elevation View – 100 m. Rifle Range



Type II – Baffled Range:

Elevation View – 50 m. Pistol Range



8.4 BACKSTOPS

Except as noted below, the backstop shall be constructed in accordance with Section 2.2 of these Standards.

Backstop Height: The minimum backstop height is determined by the individual range and baffle design. The height of the backstop shall be sufficient to insure that its crest is not visible beneath any baffle from any intended firing height and position.

Backstop Crest Length: The length of the backstop crest must exceed the crest of the left and right flank, range side berms or the peak of the range sidewalls.

Overhead Backstop Cover: The backstop shall have an overhead cover (See example on page 39). This feature is designed to prevent the escape of projectiles that ricochet off of the targets or the backstop itself, from leaving the active range area. The overhead backstop cover shall meet or exceed 25% of the requirements of the most bullet resistant baffle on the range.

It shall not be exposed to direct bullet impacts, therefore, must not be visible from any intended firing location and height. It shall project forward to cover the base of the backstop and run the length of the backstop crest. It must be imbedded into the backstop so that no gaps exist between their base and the crest of the backstop.

8.5 OVERHEAD BAFFLES

Overhead baffles are vertical or inclined panels suspended above the range floor. They are designed to capture unintentional high elevation shots and ricochets. Their construction must be able to prevent bullet perforation (perforation is defined as the complete penetration and exit of a baffle by a bullet). Therefore, baffle designs must be matched against the penetration capabilities of the ammunition fired on the range.

Armor piercing, steel jacketed or high penetration bullets should be avoided. So does tracer and incendiary ammunition due to the fire risk to the range structure, such as the baffles.

Location of Overhead Baffles

Type I, baffled ranges have an arrangement of overhead baffles that are somewhat concentrated near the intended firing line(s). They are spaced more closely together nearer to the planned firing lines and are spaced further apart as the distance downrange increases. The first baffle forward of any intended firing line, shall be located not more than 5 metres forward of that firing line and subsequent down

8.5 OVERHEAD BAFFLES (CONTINUED)

range baffles are placed such that ***"no blue sky is visible"*** beneath the first baffle from all the intended firing height(s), at all firing locations (Refer to 1st example on page 35). Type II baffled ranges do not require ground baffles and enjoy the flexibility of a firing area instead of specific firing lines as do Type I. However, they have more overhead baffles, regularly spaced over the entire active area of the range. They must be of sufficient height and placed to ensure that they capture any 30° angle ricochets from the range floor. The overhead baffles start at a point no more than 5 metres forward of the most distant firing area or line and end less than 5 metres from the base of the backstop. They must be positioned such that *no blue sky is visible* from any intended firing height from anywhere within the firing area (Refer to 2nd example on page 31). In general, the taller the baffles are, the greater the permissible spacing between them.

The overhead baffles should be positioned to have at least 2.5metresclearance between their underside and the surface of the range floor. This allows for free movement over the range and ensure that the baffles are rarely hit by direct shots.

Construction of Overhead Baffles

Overhead baffles shall have a minimum vertical dimension of 1.25 metre, and shall be supported on columns properly imbedded in the ground in accordance with local building codes. All support columns shall be located between firing lanes.

If the overhead baffles become misalign (due to frost heaving, wind, etc.) such that gaps in the overhead baffle coverage occur, all activities at the range shall cease immediately and resume only after repairs have been made to realign the baffles.

Overhead baffles can use any of the following materials, or in any combination, in their construction timber, concrete, steel or gravel. The thickness of the baffles shall be sufficient to prevent perforation by the maximum calibre and bullet nature for which the range was designed.

Table 3 can serve as guide for *recommended baffle construction* (overhead, ground or side):

Materials	Rim-fire Handgun and rifle	Centre-fire Handgun	Centre-fire Rifle
Softwood Timber	15 cm	20 cm	37.5 cm
Concrete (3000 psi)	7.5 cm	15 cm	20 cm
Steel	5 mm	8 mm	11mm
Gravel (2.5 cm)	10 cm	15 cm	30 cm

Table 3 : Recommended Baffle Construction

Alternate construction materials for baffles are acceptable as long as they provide equivalent or greater ballistic protection.

8.5 OVERHEAD BAFFLES (CONTINUED)

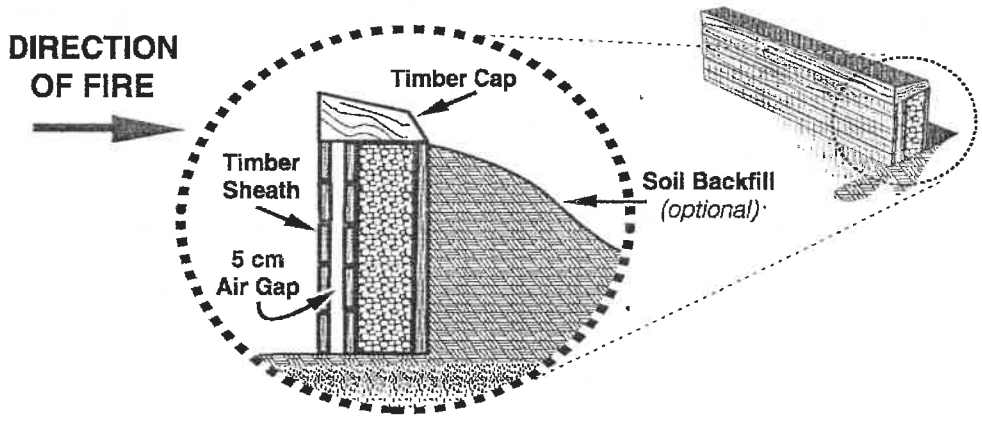
The face of the baffles exposed to the shooters shall be overlaid with at least 5 cm of planking or similar material to reduce bullet backsplash. This outer layer shall be constructed with at least a 5 cm. air gap between it and the baffle itself. This gap not only reduces backsplash, it improves the sound absorption and allow recommended periodic inspection of the baffle core.

8.6 GROUND BAFFLES

Ground baffles are required for Type I Ranges, and not required for Type II. Ground baffles are utilized to intercept low shots before they make contact with the ground, eliminating a source of ricochets. These baffles prevent shooters from moving freely over the range, so they are constrained to specific firing line(s). The number and location of the ground baffles is determined by their height above the ground. The taller the ground baffles are, the fewer are required. Ground baffle height and placement shall be such that the ground surface of the range floor cannot be visible more than 5metresforward from any intended firing location and firing height. They shall rise vertically from the ground. Ground baffles can be backfilled with soil for additional support (optional).

Ground baffles shall be fitted with an angled timber or equivalent material cap piece. The downward slope of the cap piece shall be sufficient to prevent ricochets off the top of the baffle. A downward slope to this surface of at least 5° is recommended. The baffle cap piece shall not be considered as part of the baffle for assessing placement or height. Cap pieces are to be replaced as soon as they become *significantly* damaged from bullet impact.

The following is an example of a ground baffle design:



8.7 SIDE BERMS / SIDE WALLS / SIDE BAFFLES

All baffled ranges shall have side berms or sidewalls. They shall have a minimum height of 3 metres above the range floor and their minimum height shall exceed the height of the overhead baffles underside by at least 0.5 metre. Side berms and sidewalls can be combined to achieve the necessary heights.

The side berms or sidewalls shall run the length of the active area of the range, begin at least 1metrebehind the most distant firing line and be joined to the backstop.

Side Berms: Side berms shall be in accordance with Section 2.5 of these Standards. If used, their base shall be located at least 2 metre clearance from the outside edge of the flank target lanes.

Side Walls: Side walls shall rise vertically from the range floor. They shall meet or exceed 70% of the considered requirements of baffles as described on page 43.

Side Baffles: If the side berms do not meet the requirements (e.g. slope, composition, etc.) of Section 2.5, the range shall be fitted with vertical side baffles. These side baffles are designed to shelter the side berms. They shall be located to ensure that from any intended firing distance(s), the side berm is sheltered from direct bullet impacts. The specific locations of the side baffles will depend on the intended firing distance(s) and the width of the side baffles. Refer to the method for **Location of Overhead Baffles**, Type I baffled ranges, (page 42). There shall be at least 1 metre clearance between the inside edge of side baffles and the outside edge of the adjacent flank firing lane or firing location.

If the side baffles are aligned with the overhead baffles, they shall rise vertically to meet the underside of the overhead baffle. If not, then they shall rise the height necessary to provide shelter of the side berms and prevent any gap between the overhead and side baffles.

8.8 RANGE FLOOR

In accordance with Section 2.

8.9 FIRING LINES / FIRING POINTS

In accordance with Section 2.3, as applicable. It should be noted that Type I baffled ranges are designed for specific firing lines or locations (distances), while Type II have more flexibility inherent in their design, allowing firing location(s) or area(s) within the active range area.

8.10 TARGET HOLDERS /TARGETS

In accordance with Section 2.6, as applicable.

Soft targets used on a baffled range (e.g. paper, cardboard, etc.) can be moved forward and back to accommodate different firing distances. This can be accomplished with moveable target base or with an overhead track suspended from the overhead baffles.

The use of *unsheltered* steel target is not permitted on baffled ranges (See Section 8.2, for further information).

Targets are not to be placed on the top of ground baffles.

SECTION 9
INDOOR RANGES

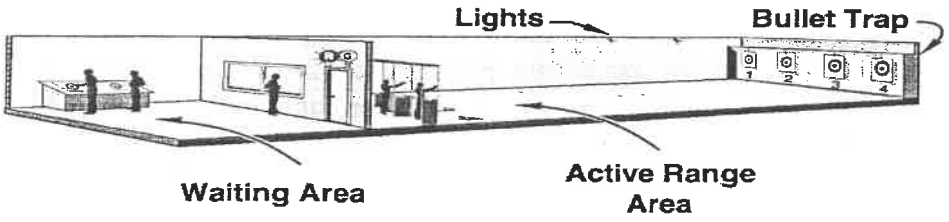
9.1 INTRODUCTION

This Section pertains to indoor ranges used for shooting rifles and handguns (for shotgun use, contact the CFO for more information). These ranges consist of a firing line(s), an active range area with a downrange Protected Zone (PZ), a ventilation system to remove air contaminated by firing, and a bullet trap, all of which are contained within a suitable building. They do not have a safety area exterior to the building where located. The range may also have a variety of additional equipment and structures required for operation (e.g. target carriers, waiting area, etc.).

Indoor ranges are typically laid out with a specific number of firing points and firing line(s) located at specific distance(s) from the targets. These Standards have been written with this design in mind. However, the use of the active range area as a more expansive firing area for a single shooter is certainly acceptable.

There are a number of ways to achieve the aims of this Section. This is particularly true in the selection of construction material. *Alternate materials and arrangements are acceptable as long as they provide an equivalent level of safety to the requirements described in this Section.*

The following is an example of an indoor range:



BUILDING CUTAWAY

9.2 SAFETY CONSIDERATIONS

There are a number of safety considerations for indoor ranges, and they fall into two broad categories: ballistic and environmental. The ballistic issues are concerned with bullet containment and backsplash. The environmental issues are concerned with range ventilation and lead contamination.

These Standards will deal primarily with ballistic issues. Users of these Standards must refer to the appropriate New Brunswick Provincial agencies for detailed guidance on environmental issues and applicable requirements. Contact the CFO to obtain information about the specific agency to be contacted.

The underlying goal of this Section is the safe containment within the range of all projectiles and any subsequent ricochets or backsplash generated in the course of firing, conducted in accordance with the Range Operating Instructions. This requirement, in conjunction with the calibre of firearms to be fired, and the intended use (shooting activities), will dictate the selection of construction materials and the range design.

Ammunition: Bullet construction and calibre's used on an indoor range must be matched against the bullet trap and Protected Zone design and construction.

The requirements provided in this Section are based on copper alloy jacketed (FMJ, JHP, JSP, etc.) or lead alloy bullet natures. The requirements are not intended to accommodate the following prohibited ammunition: armor piercing, tracer, incendiary, solid steel core bullets or hardened metal penetrator bullet designs.

Lead Contamination/Decontamination: The following general recommendations are made with regards to lead contamination:

- That all individuals involved with designing, approving, operating or using indoor ranges make themselves fully aware of the health hazards posed by the lead contamination associated with operating indoor ranges ;
- That Range Operator's develop a lead control plan to minimize the hazards posed by lead contamination;
- That food or drink not be consumed in the active range area;
- That if the active areas of indoor ranges are used for non-shooting activities, the Range Operator should ensure that the individuals involved are not exposed to hazardous lead residue from the range;
- The active range area(s) should be regularly cleaned using a vacuum system specifically designed to capture lead residue (e.g. a HEPA vacuum) or a wet-wash system.

9.2 SAFETY CONSIDERATIONS (CONTINUED)

If lead contamination is determined to be an identified hazard on an indoor range, the risk may be removed or reduced through the exclusive use of lead-free ammunition. Range operators are advised to thoroughly research lead-free ammunition before undertaking expensive facility upgrades (e.g. ventilation).

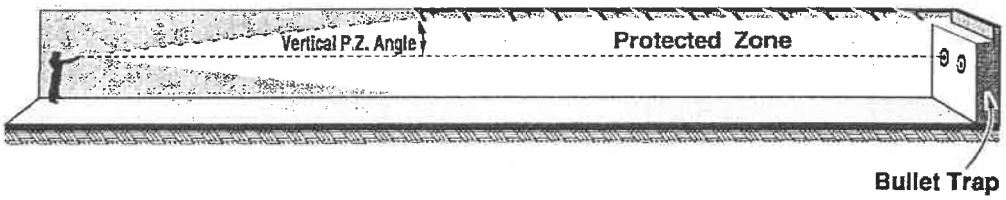
9.3 PROTECTED ZONE

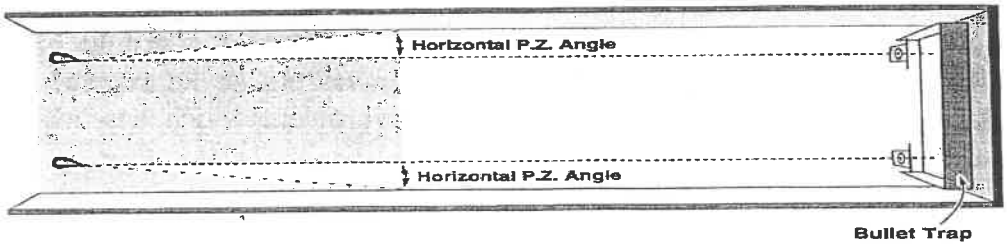
To ensure the containment of bullets fired in accordance with the Range Operating Instructions within the building, all indoor ranges shall have a downrange Protected Zone (PZ). This area surrounds the bullet trap and a significant portion of the downrange area. The Protected Zone is the area forward of the firing line(s) from which an errant shot or ricochet will not escape the range. The *minimum* extent of the PZ is determined by horizontal and vertical measurements taken from the intended firing position (e.g. prone, kneeling, standing) at all the planned firing locations. The limits of the downrange PZ area are defined by the angular measurements contained in the following table:

	Rim-fire Rifle	Rim-fire Handgun	Centre-fire Handgun and Rifle
Vertical	10°	15°	15°
Horizontal	6°	10°	15°

Table 4 : Indoor Ranges Protected Zone Angles
Note: PZ angles are measured from the line of sight from the shooter to the target applied to all planned firing heights.

The first example demonstrates the vertical PZ angle, while the second demonstrates the horizontal PZ angle: (Angles may not be to scale.)





9.3 PROTECTED ZONE (CONTINUED)

All of the downrange area outside of the bullet trap and within the PZ, shall be sheltered by, baffles or wall/ceiling/floor construction and design such that no projectile or ricochets can perforate the materials and escape the active range area.

There shall not be any doorways or other access points into the active range area, forward of the most distant firing line that can be opened from the exterior.

All range fixtures (e.g. lights, sprinkler heads, pipes, etc.) within the PZ shall be sheltered from being struck by projectiles fired from the firing line(s), by baffles or other similar features.

Adjoining Rooms: Rooms that adjoin the active range area, that are forward of the most distant firing line, shall be protected from shots fired from those line(s) within the range, by the construction of the intervening walls. The provisions of this paragraph also apply to rooms or spaces above or below the active range area. The protection of adjoining space(s) shall be accomplished by, baffles or suitable wall, floor or ceiling construction that is impenetrable by shots fired. Refer to Section 9.6 for information about construction materials.

Range Waiting / Observation Area: The range facility may be equipped with a waiting or observation area. If the range has a waiting/observation area, it shall be separate from the active range area. It shall be ventilated such that the active area range air is not able to freely enter the waiting/observation area when the range is in operation. Any doors that separate the waiting/observation from the active range area shall be fitted with weather stripping or equivalent fittings intended to impede the exfiltration of lead contaminated air from the active range area when the range is operating.

9.4 ACTIVE RANGE AREA

Floor: The floor of the active range area shall be constructed to minimize bullet splash and to facilitate cleaning (lead decontamination). The floor shall not have any sharp angular surfaces or edges facing the firing line that could generate bullet backsplash.

When practical, it is recommended that the active range area floor be of poured concrete or of an equivalent construction. If the floor is of plank construction or similar, planks joints shall be filled and sealed. The use of soil, sand, gravel, etc. as the exposed floor surface in the active range area is not recommended due to problems which these material pose for lead decontaminating.

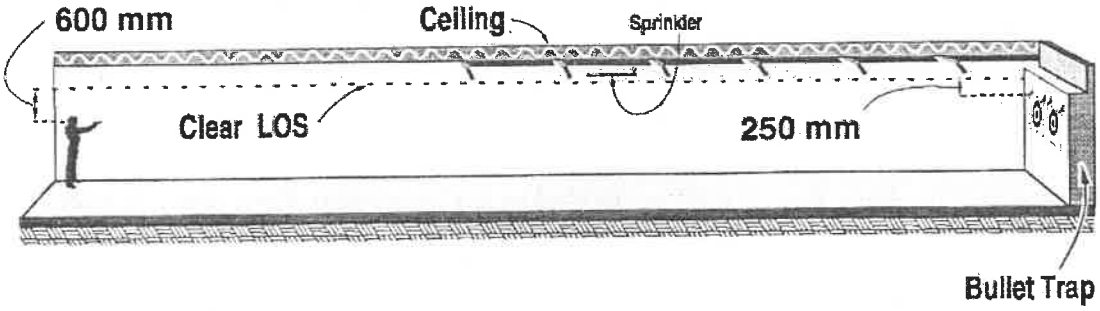
9.4 ACTIVE RANGE AREA (CONTINUED)

If employing the wet-wash methods to clean and decontaminate, it is recommended that the active area floor be sloped to provide drainage and that a waste water collection system be provided.

The Range Operator is to ensure that lead contaminated materials collected are disposed of in accordance with any applicable environmental requirements.

Ceiling Height and Line of Sight Clearance: The ceiling (or roof) in the active range area shall be of sufficient height to provide for safe firing. All roof members, trusses, baffles, pipes, sprinkler head, lights, etc. must be above the minimum clear line of sight between the firing line(s) and the targets.

The clear line of fire shall be a minimum of 60 cm above the maximum firing height (determined by the shooters firing positions: prone, kneeling or standing) at the firing line(s) and 25 cm above the top of target at the bullet trap. See the following as example:



Lighting: The active range area shall be equipped with a lighting system that provides adequate illumination. There can be local or spot lighting systems to provide additional illumination to the targets and to the firing line(s).

There shall be an emergency lighting system within the active range area that is in accordance with local fire, municipal or provincial regulations. The emergency lighting shall be configured in order that the active range area would be automatically illuminated in the event of a power failure.

Range Signage: There shall be *Range Safety Rules* as per applicable Section 1.3.3. They shall be located in a common area such as waiting/observation area or near the primary range access door, clearly visible to all range users. It is recommended that separate signs be displayed within the active range area advising users to wear eye and ear protection, not to smoke and not to eat or drink in that area.

9.4 ACTIVE RANGE AREA (CONTINUED)

Target Holders: As per Section 2.6, except as noted below.

Target holders shall be constructed such that targets can be held at the various heights above the range floor needed to accommodate the various firing heights for which the range was designed. This is to promote the shooter's engagement of the targets with an angle of fire that is horizontal as much as possible.

Target Carriers and Mechanisms: To facilitate efficient range operations, and to reduce the exposure of shooters to lead contaminants that collect on the floor, the use of a target carrier system to move the targets forward and back from the firing line to the target line is encouraged when practical. If provided the target carriers and associated target mechanisms shall be constructed to minimize bullet backsplash and ricochets. This can be accomplished by sheltering the metal surfaces with wood or by angling downwards any flat metal surfaces.

9.5 FIRING LINES / FIRING POINTS

The provision of this Section shall apply for indoor ranges with multiple lane operations. Refer to Section 2.3, for applicable general requirements.

Firing Lanes: The range shall be laid out with the concept of individual firing lanes.

Firing Line(s): The firing line(s) shall be parallel to the bullet trap. Each firing line and the distance to the targets shall be permanently marked (e.g. panted) on the range walls and/or floor.

The firing line shall exceed the outside edges of the flank target lanes by 0.5 m.

Firing Points: Except as noted below, firing points shall be in accordance with Section 2.3, of these Standards.

Where practicable, the use of firing point separators between adjacent firing lanes is recommended. These separators are intended to provide each shooter with a definite firing area. They also serve to protect the shooters from being hit by ejected cartridge cases originating from other lanes. The separators shall not significantly obstruct airflow, can be fitted with small tables to assist shooters and made of sound absorbing material to reduce firing noises.

9.6 ACTIVE RANGE AREA CONSTRUCTION

This Section pertains to the design, construction and the selection of materials for the active range area. The requirements of this Section are to be considered as additional to the design and construction requirements imposed by local building codes, regulations and practices.

When practical, the use of concrete as structural material for floors, walls and ceiling of the active range area is encouraged. When concrete is used as the main structural material, the protection provided by the Protected Zone is likely already afforded by the building structure itself.

Protected Zone Construction Materials: If structural construction materials are used within the Protected Zone to provide ballistic protection, then they shall meet or exceed those listed in Table 5b below:

Calibre Class	Concrete *Note 1*	Brick *Note 2*	Concrete Block *Note 3*	Hardwood Timber	Softwood Timber
Rim-fire Rifle and Handgun	75 mm	103 mm	100 mm	125 mm	150 mm
Centre-fire Handgun	150 mm	215 mm	215 mm	175 mm	200 mm
Centre-fire Rifle	200 mm	215 mm	300 mm	250 mm	375 mm

Table 5 : Protected Zone Construction Materials
Note 1: 20 N/mm² (3000 psi) strength, 20 mm Aggregated Concrete
Note 2: Void-free construction brick
Note 3: Dense aggregate solid concrete blocks

The use of unprotected hollow core construction blocks (e.g. cinder blocks) is not recommended as they do not sustain damage well from glancing or direct bullet strikes. If used, it is recommended that they be clad with additional materials in accordance with Table 5.

Protection Zone Baffles: Overhead or side wall baffles in the Protected Zone can be used to augment or provide primary protection against the escape of projectiles from the active range area. There are a number of construction materials that can be used to construct baffles. The determination of any particular baffle suitability is its ability to stop ammunition being fired on the range. If baffles are used to provide ballistic protection within the PZ, they shall meet or exceed the requirements of Table 5 or the requirements of Table 6 (next page), as applicable.

All baffles shall be clad in 5cm timber on their firing line side. The back of the baffles shall be visible for inspection purposes. Baffles within 10metresof a firing line shall be angled at approximately 25° to 30° from horizontal to minimize backsplash and to deflect ricochets or bullet fragments downrange instead of back towards the firing line.

9.6 ACTIVE RANGE AREA CONSTRUCTION (CONTINUED)

Baffles designed of steel shall meet or exceed the requirements of Table 6 below:

Firearm Calibre Class	Steel Thickness (*Note 1*)
Rim-fire Rifle and Handgun	5 mm
Centre-fire Handgun	8 mm
Centre-fire Rifle	11 mm

Table 6 : Indoor Range Baffle Construction
Note 1: Mild Steel (0.15 – 0.25% Carbon

Protected Zone Inspections: The PZ, including all baffles and interior surfaces, shall be inspected periodically by the Range Operator. Damage to protective surfaces shall be repaired as required.

9.7 BULLET TRAP

The bullet trap is located behind the most distant target line, at the end of the range. Bullet traps are intended to safely contain bullets and the attended ricochets or fragments of shots fired in accordance with the Range Operating Instructions. There are many different bullet trap designs, some better suited to specific use than others. The bullet trap must be matched to the intended range usage (e.g. maximum calibre, bullet nature and firing angles).

A number of companies produce commercial bullet traps. Each commercial bullet trap will be provided with specific calibre and bullet design information. If a commercial bullet trap is utilized, this information must be supplied with the Application for Approval of a Shooting Range.

These Standards will provide a limited number of examples of bullet trap construction and design. Additional information on bullet traps is readily available from a number of other sources, such as bullet trap manufacturers and sport governing bodies.

The information in this Section is provided for the use of all stakeholders. It is not intended to prevent the use of bullet trap designs not discussed. Each bullet trap design must be considered on its own merits.

Because of fabrication and construction details (e.g. steel hardness and abrasion resistance), a report from a licensed Professional Engineer is required for any *non-commercially* manufactured bullet trap, or any commercial bullet trap lacking the necessary documentation from the manufacturer. The Professional Engineer's report shall provide construction details of the trap and the maximum calibre nature ratings for sustained operations of the bullet trap. For bullet traps designed for Centre-fire rifle calibre's, contact the CFO for more information.

9.7 BULLET TRAP (CONTINUED)

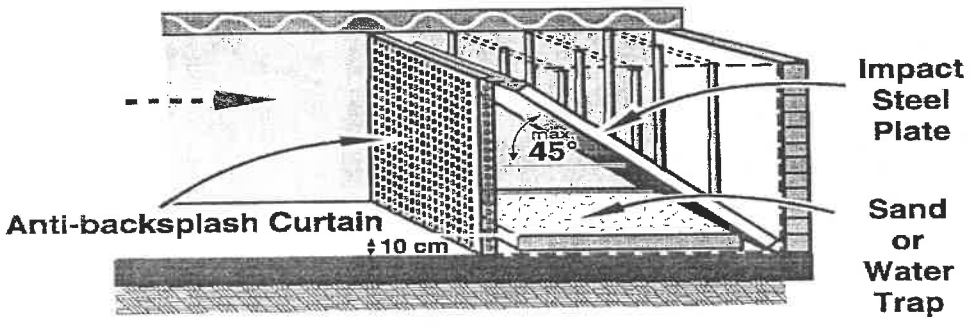
Bullet Trap Designs: The bullet trap design selected for indoor ranges must be rated to the maximum calibre of firearms to be used and to the most robust bullet design (nature) intended for use. It must be able to safely contain all projectiles, bullet fragments and ricochets generated by firing conducted in accordance with the Range Operation Instructions.

Regardless of the particular backstop design used, there are common construction requirements, which are:

- edges of steel plates must be cleanly abutted with no gaps or protruding edges;
- seams in the steel plates must be backed by an equivalent thickness steel plate at least 10 cm wide running along the seam length and centered on the seam;
- seams should not be located behind the Mean Point of Impact (MPI) for any lanes ;
- exposed screw heads/bolts must be flush with the steel plating ;
- bolt nuts are not to be exposed to projectile impact;
- steel plates must be adequately supported to ensure that they do not buckle, bow or waver as a result of their own weight or sustained use;
- edges of steel plates exposed to direct bullet impact shall be beveled and have a fillet radius of not more than 1.5 mm.

The use of a sacrifice plate tack-welded to the steel backstop over the MPI's is one method of improving longevity of the steel backstops. The sacrifice plate is placed on the backstop to sustain a high percentage of bullet impacts. The edges of the plate shall be beveled to provide a smooth transition to the backstop plate. Once the sacrifice plate has been worn out, it can be readily replaced. This is a far less expensive method of backstop repair than having to repair the main backstop impact plate.

45° Angled Steel Plate Design: One of the simplest bullet trap designs to construct is the angled steel plate design. This design uses a, steel plate angled at 45° or less to the direction of fire. Impacting bullets are intentionally ricocheted downwards into a water or sand trap located at floor level. The following is an example of such a design:



SIDE VIEW

9.7 BULLET TRAP (CONTINUED)

This design generates considerable amounts if fine lead dust contamination resulting from the severe deformation of bullets impacting the angled steel plate.

The steel plate shall meet or exceed the requirements of the next Table (Table 7):

Calibre	Min. Steel Thickness *(Note 1)*	Mild Steel Min. Thickness *(Note2)*	1T100 Armor Steel Min. Thickness
.22 LRHV	7 mm	6 mm	4 mm
9mm,.357,.44,.45, .50	10 mm	12 mm	8 mm

Table 7: 45° Angled Steel Plate Minimum Requirements

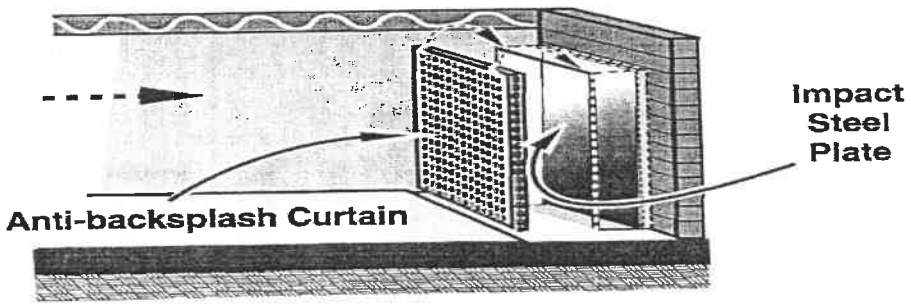
Note 1: AR-450 for .22 LR and AR-500 for Centre-fire Handgun. The use of alternate specification steel that exceed these requirements is permitted.
Note 2: 0.15-0.25% Carbon mild steel, grades: 260W. 300W, 260WT, 350WT, 380WT, 400WT, 350R, 350A, 400A, 480A, 700Q, 700QT or their equivalent.

The sand and water trap beneath the impact plate shall be at least 10 cm deep. It shall completely cover the floor area beneath the steel impact plate. If sand it must be coarse and free of hard inclusions such as stone. If water, it shall be replenished as required.

This bullet trap design may be used for ***Centre-fire handgun*** *and* ***rim-fire handgun and rifle.***

The use of an anti-splash curtain is recommended.

Vertical Steel Plate Design: This design utilizes a vertical steel plate to fragment fired bullets on impact. This is a simple and reliable design for a bullet trap. However, *it is suitable only for* ***rim-fire calibre's handguns and rifles.*** This design also generates considerable amounts of contamination in the form of fine lead dust resulting from severe deformation of bullets impacting the steel plate. The following is an example of such a design:



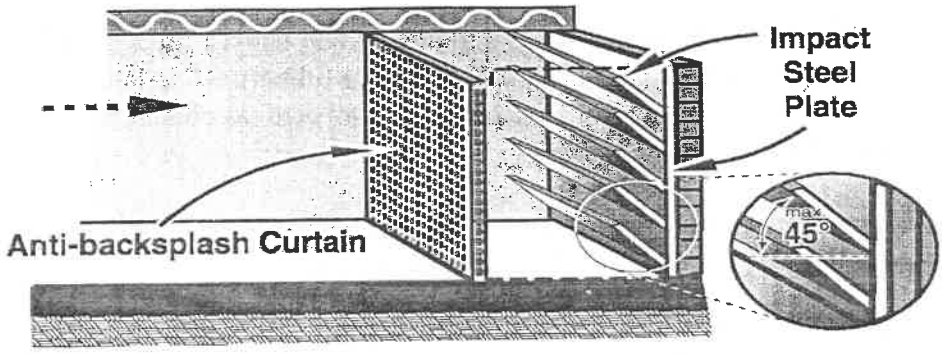
SIDE VIEW

9.7 BULLET TRAP (CONTINUED)

The steel plate shall have a minimum thickness of 6 mm for 0.15% to 0.25% carbon mild steel or a minimum of 4 mm thickness for 1T100 armor steel.

The steel plate shall be enclosed within a wooden or sheet metal enclosure. The enclosure shall be fitted with an anti-backsplash curtain positioned at least 30 cm in front of the steel backstop.

Venetian Blind Design: The Venetian Blind design utilizes multiple angled steel plates arranged one above the other. The steel plates shall be angled at no more than 45° to the horizontal and shall be configured with an overlap such that the lip of one plate is positioned higher than the base of the plate above it. The steel plate shall meet or exceed the requirements of Table 7, previous page. The use of an anti-backsplash curtain is recommended. The following is an example of a Venetian Blind design bullet trap:



SIDE VIEW

Passive Snail™ Design: The Snail design is one class of bullet trap designs that are able to capture fired bullets with as little deformation or damage as possible. Minimizing bullet damage reduces the amount of fine lead dust originating from the bullet trap. The snail design employs shallow angle steel plates to deflect incoming bullets into a circular deceleration chamber. In some designs, the deflection plates and deceleration chamber are constantly sprayed with water based liquid to entrap lead residues and reduce friction between the bullets and the steel plates.

Note: The Snail trademark is held by the Savage Arms Corporation of the USA

Bullet Trap Maintenance: The Range Operator shall inspect the bullet trap regularly to ensure that it is in good condition. Special attention is to be paid to the impact plates, especially in the Mean Point of Impact (MPI) areas. The presence of impact plate perforation sagging or other worn and damaged components are significant safety concerns requiring repair actions.

9.7 BULLET TRAP (CONTINUED)

Bullet Trap Anti-Backsplash Curtain: The use of a bullet trap anti-backsplash curtain is required for any vertical steel impact plate and recommended for all 45° angled metal plate bullet trap.

Anti-backsplash screens are not generally required for the Snail™ type designs, bullet trap designs with low angled impact plates (25°or less) or other passive bullet trap designs.

The primary function of the anti-backsplash curtain is to contain bullet backsplash within the bullet trap. It also promotes the containment of fine lead dust particles to the immediate area.

This curtain is to be located behind the targets and in front of the bullet trap, and shall cover its entire length. It should be configured to allow easy viewing and inspection of the backstop.

There are various designs of anti-backsplash curtains, which satisfy the same function. These include the Linatex™ panels or similar self sealing rubberized or latex materials, wood planks (e.g. 2.5 x 15 cm softwood boards) slid into vertical channels, and heavy layer of carpet or similar material.

Regardless the design or materials used, they will become shot-out eventually and must be repaired or replaced.

9.8 WARNING LIGHTS

There shall be a warning light system used to indicate the operational status of the range. They shall be visible to shooters on the active range area and to people outside the range (waiting/observation area). These warning lights shall be under the control of the supervising Range Officer. The warning light system can be an illuminated " **Warning Range In Use"** sign, or red and green warning lights or beacons as per Section 1.3.2.2.

9.9 RANGE VENTILATION

Notwithstanding the requirement to meet provincial ventilation standards, it is recommended that the air supply to the range be behind the firing line. To ensure uniform airflow across the firing line, the supply air should be provided from ducts located less than 2 metres above the range floor and that are evenly spaced along the firing line.

9.9 RANGE VENTILATION (CONTINUED)

To promote the efficient removal of firing gases from the firing line, the air supplied behind the firing line should be smooth laminar flow, not a turbulent flow. To promote efficient and controlled removal of the lead residues, the range ventilation should be operated at a *negative pressure* (e.g. the air exhaust system attempts to exhaust more air than is supplied). Having negative air pressure prevents the escape of lead contaminated air to adjacent areas.

Dependent on the intended range use there are two common exhaust configurations, which may be employed:

Configuration 1 – exhaust ducts located approximately 5 to 6 metres forward of the firing line and ducts located in the area of the bullet trap. The ducts forward of the firing line should exhaust approximately 25% of the supplied air volume while the ducts at the bullet trap should exhaust 75% of the supplied air volume.

Configuration 2 – exhaust ducts located in the area of the bullet trap configured to exhaust all of the supplied air volume.

All supply and exhaust ducts should be evenly spaced across the width of the range to promote efficient and even air movement.

If the exhaust air from the range is *filtered* to remove lead or dust particles, then it is recommended that an air pressure alarm or indicator be installed. This air pressure alarm is intended to signal when the filters have become clogged and need to be replaced or cleaned. Filters will clog and result in the extraction of air from the range being impaired, causing diminished airflow and the loss of the negative air pressure within the range.

9.10 TARGETS

The selection of target types for use in outdoor ranges is at the discretion of the Range Operator.

The use of hard targets (e.g. steel) in an indoor range should be closely monitored, and are usually not recommended. The courses-of-fire using hard targets should be critically evaluated to ensure that the range users and the exterior users are not put at risk as a result of inappropriate use given the range design.

If hard targets are used, the minimum engagement distance is 10 metres.

SECTION 10
FIELD FIRING RANGES

10.1 INTRODUCTION

A Field Firing Range may be configured in accordance with a standard rifle or handgun range, without the backstop or with an inadequate backstop, or it can be configured as an austere range built using existing natural features.

If the range is configured in accordance with a standard rifle or handgun range *but it does not have an adequate backstop*, then the appropriate Field Firing Safety Area template(s) from **Appendix A** shall be applied. The Standards in Section 1, 2 and 3 also applies with the exceptions of Sections 2.2, 3.2 (backstops), 2.4 and 3.4 (range floor).

An austere field range is one that requires few constructed features and it uses the natural attributes of the range site. Austere field firing ranges have a firing area(s), target area(s) , *no backstop* and *must have a suitable downrange safety area.* The provisions of this Section are applicable to this type of range.

10.2 SAFETY CONSIDERATIONS

Human Activity – Safety area: The general allowance of safety area provided in Section 1.3.4 cannot be applied to this type of range. *Therefore human activity should not be approved within the safety area of a field firing range.* The total field firing safety area is determined by applying the appropriate maximum open field-firing template. That total safety area must be appropriately marked with perimeter signs as per applicable of Section 1.3.1.

Locating Range: The accurate siting of the firing and target areas is an important safety consideration. It is important that the firing arcs do not exceed the limits for which the range was designed. A great deal of flexibility is permitted, provided that the safety area traces for all shooter/target combinations are kept within the range property and in accordance with the range approval. The use of appropriate survey techniques to site these areas is recommended.

It is recommended that the target areas not be placed on the crest of hills or rises. When practical, the vertical angle of fire for the shooter/target alignment be approximately horizontal or that they are depressed below the horizontal.

10.2 SAFETY CONSIDERATIONS (CONTINUED)

Backsplash/Ricochet Hazards: It is recommended that the courses-of-fire be appropriate for the terrain of the firing area(s). The course-of-fire should be planned to reduce the likelihood of shooters firing into potentially hazardous ricochets or backsplash surfaces located close to them.

Reduced Safety areas: Hills and similar topographical features within the trajectory envelope can be used to reduce safety template requirements. Trees, bush and shrubs do not provide a barrier that can be used to reduce the safety template requirements.

10.3 RANGE LAYOUT

The layout of a field firing range is flexible and user defined, provided that the requirements of this Section are met and that all the range safety areas are confined to the land area formally or informally controlled by the Range Operator.

Field firing range safety areas should not overlap other ranges, walking trails or areas likely to be frequented by people *when the range is in use*. When having people in the safety area of a field firing range is likely, there shall be a flag, beacon or similar system installed, warning user to prevent firing onto downrange areas when it is in use.

10.4 BACKSTOP (OPTIONAL)

Although backstop are not required for field firing ranges, the presence of even a small backstop can dramatically reduce the occurrence of projectiles and ricochets travelling into the downrange area. If a backstop is provided, the slope of the forward face should be steeper than 30° and free of major outcropping rocks or other hard materials. The height and crest length is the decision of the Range Operator.

10.5 FIRING AREAS

Firing areas are the defined areas from which shooters engage their target(s). They can be as expansive as required be the course(s)-of-fire. They shall be demarcated with post, pegs, pylons or other similar markers to ensure that shooters can readily identify the intended firing area(s).

If more than one shooter at a time is to be in the same firing area, then provisions shall be made to prevent shooters from endangering or interfering with each other.

10.6 TARGET AREAS

Target areas are the defined areas in which targets can be placed. They can be as expansive as are required by the course(s)-of-fire. They shall be clearly demarcated with posts, pegs, pylons or other similar markers to ensure that the targets can be reliably placed in the appropriate area(s).

10.7 TARGET HOLDERS AND TARGETS

In accordance with Section 2.6, of these Standards.

SECTION 11
RANGE OFFICERS (RO)

The *Firearms Act Regulation* pertaining to Shooting Clubs and Shooting Ranges Regulations, Section 5 (e), page 121, states: if more than one person is simultaneously engaged in shooting activities on the shooting range, a person acts as the range officer.

"Range Officer" means an individual who oversees the shooting activities at the firing line of a shooting range.

The Range Officer has complete authority on the range property to conduct authorized shooting practices and matches. RO's have the responsibility to supervise all personnel present on the property.

All RO's operating the facility *should have a valid Range Officer Certification* from a recognized agency. RO qualifications are recognized from the following agencies or groups : RNBRA, SFC, IPSC, RCMP (Range Master course), Canadian Armed Forces Range Safety Officer training, DFO, Ports Canada Police, DNRE or any other individual whose equivalent qualifications are deemed acceptable by the Range Operator.

APPENDIX A
SAFETY AREA TEMPLATES

The templates in **Appendix A** do not apply to standard outdoor ranges that comply with Sections 2.2 and 2.4 (rifle ranges) as 3.2 and 3.4 (handgun ranges) of these Standards.

When a Range Operator who chooses not to comply with the Standards of those Sections, for whatever reasons, the templates for *standard ranges* will be applied as safety area for that range. The safety area must be appropriately marked with perimeter signs and must be controlled by the Range Operator.

The Field Firing Safety templates will be applied to Field Firing Ranges. The safety area must be appropriately marked with perimeter signs and must be controlled by the Range Operator.

APPENDIX A

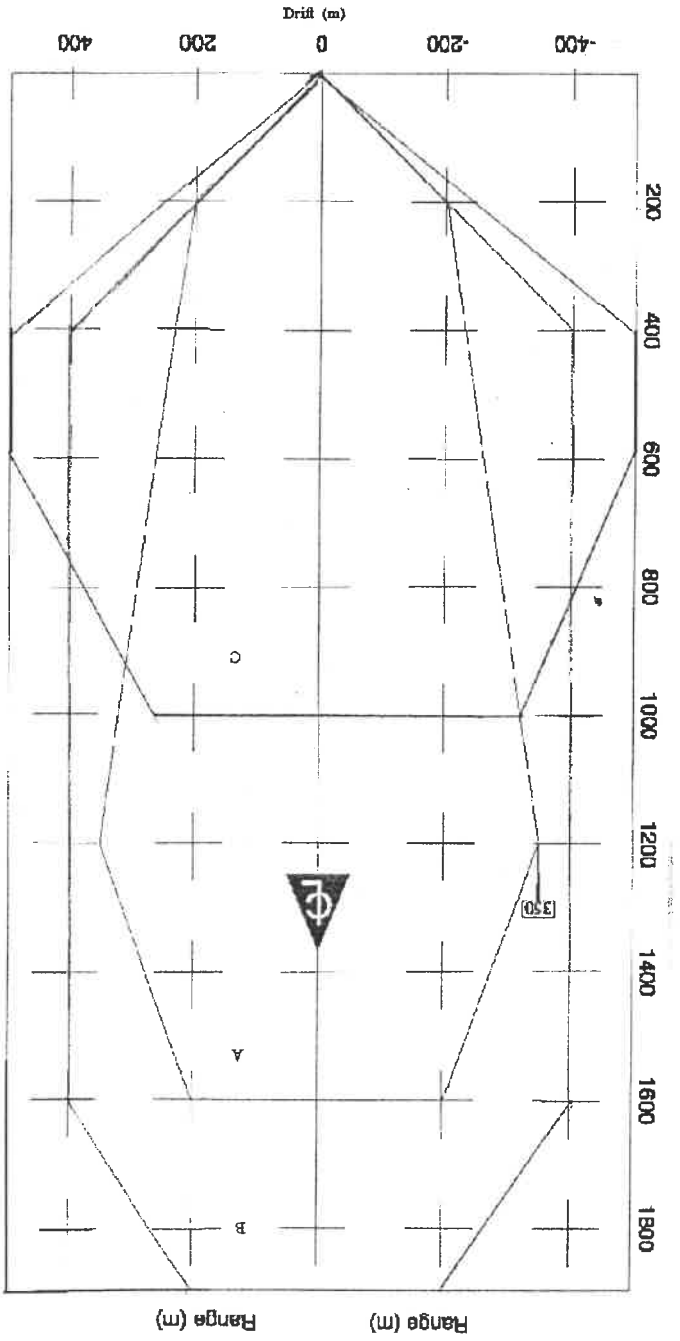


Figure 12 – Safety Area Templates for Standard Handgun Ranges (not complying with Sections 3.2 and 3.4. Template A – 9mm; Template B: 357 Magnum; Template C: 22 LR HV

APPENDIX A

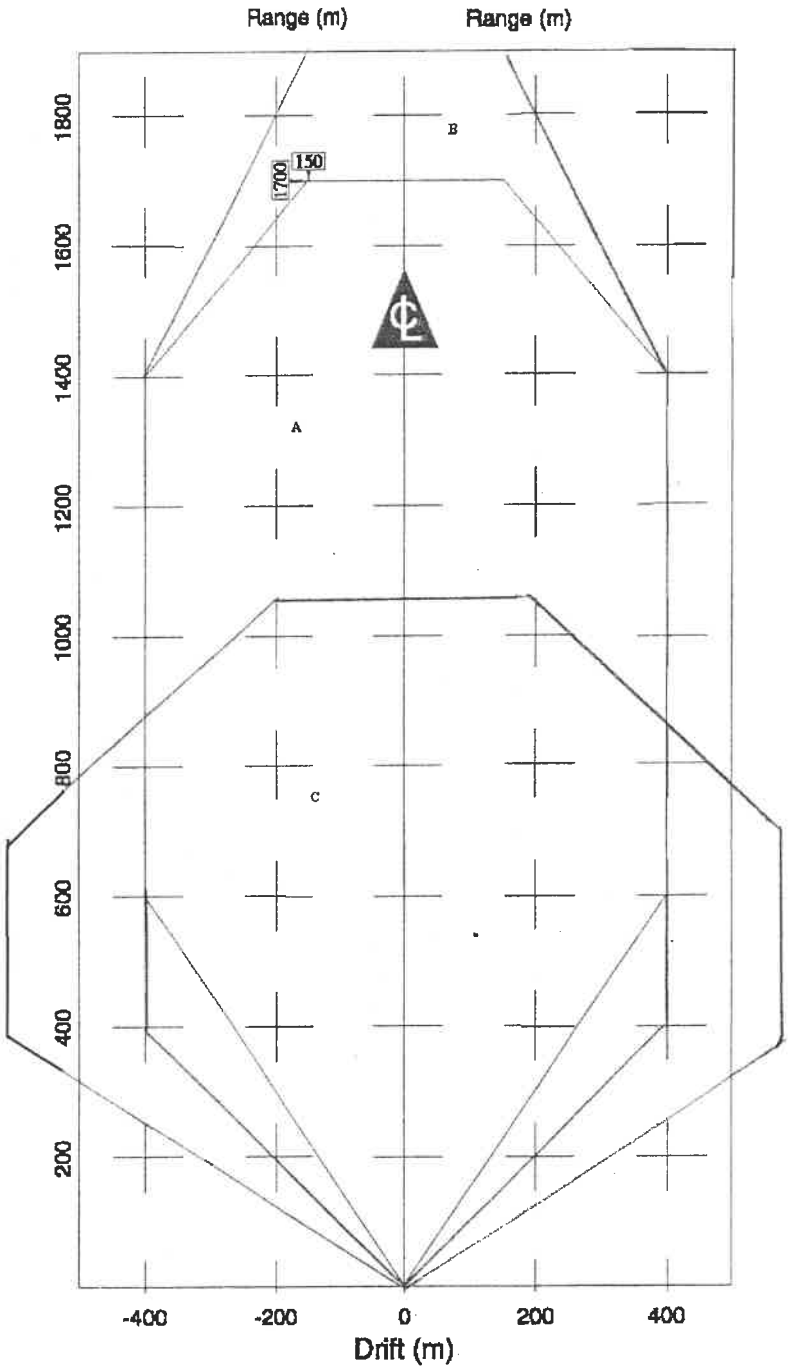


Figure 13 – Safety Area Templates for Field Handgun Ranges: Template A: 9 mm; Template B: 357 magnum; Template C: 22 LR HV

APPENDIX A

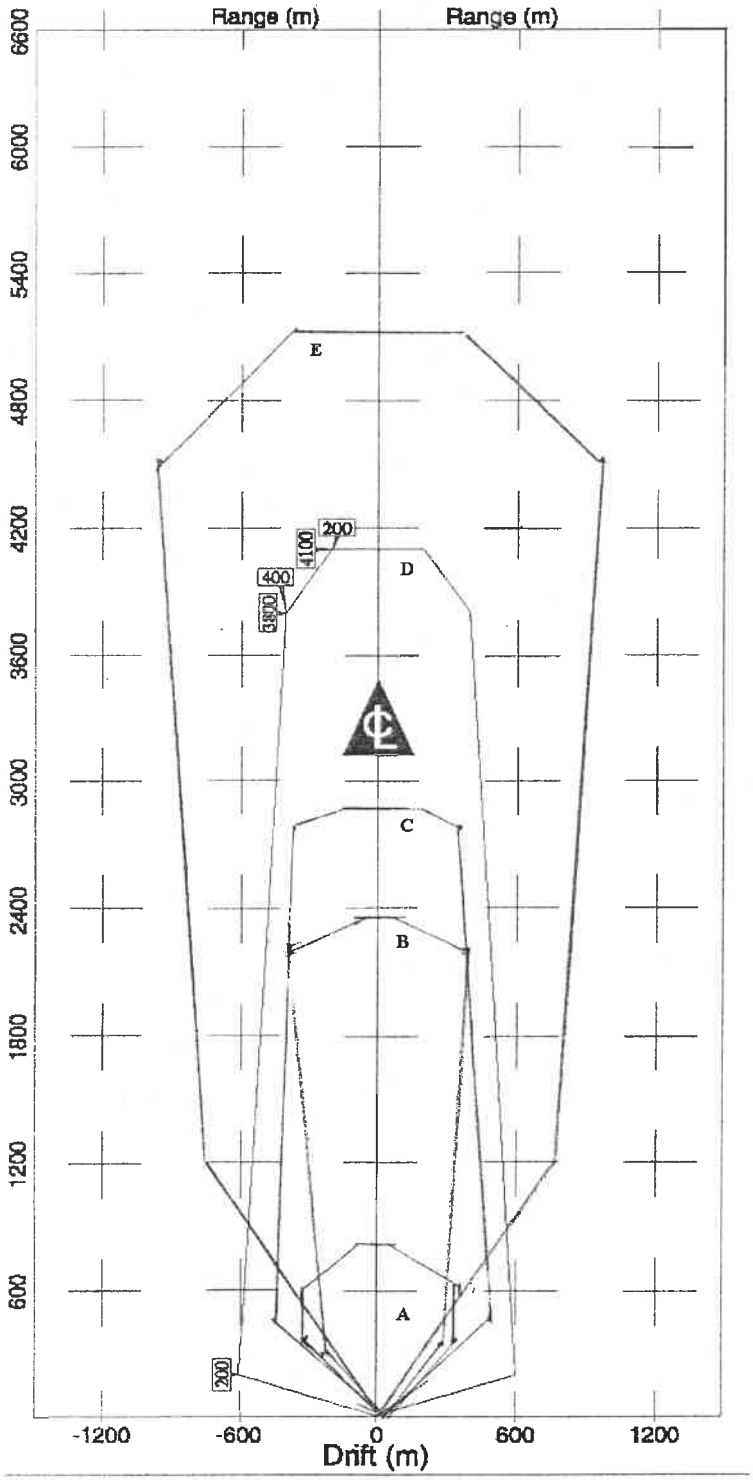


Figure 14: Safety Area Templates for Standard Rifle Ranges (not complying with Sections 2.2 and 2.4)

A: .22 LRHV; B: .223 Rem. (22-250, .30.303, .32, .35); C; 308 Win. (.30-06, 7mm, 6.5, .270) D: .338 Lapua Mag. (7mm mag., .300 mag., 8 mm mag.) E: .50 Browning

APPENDIX A

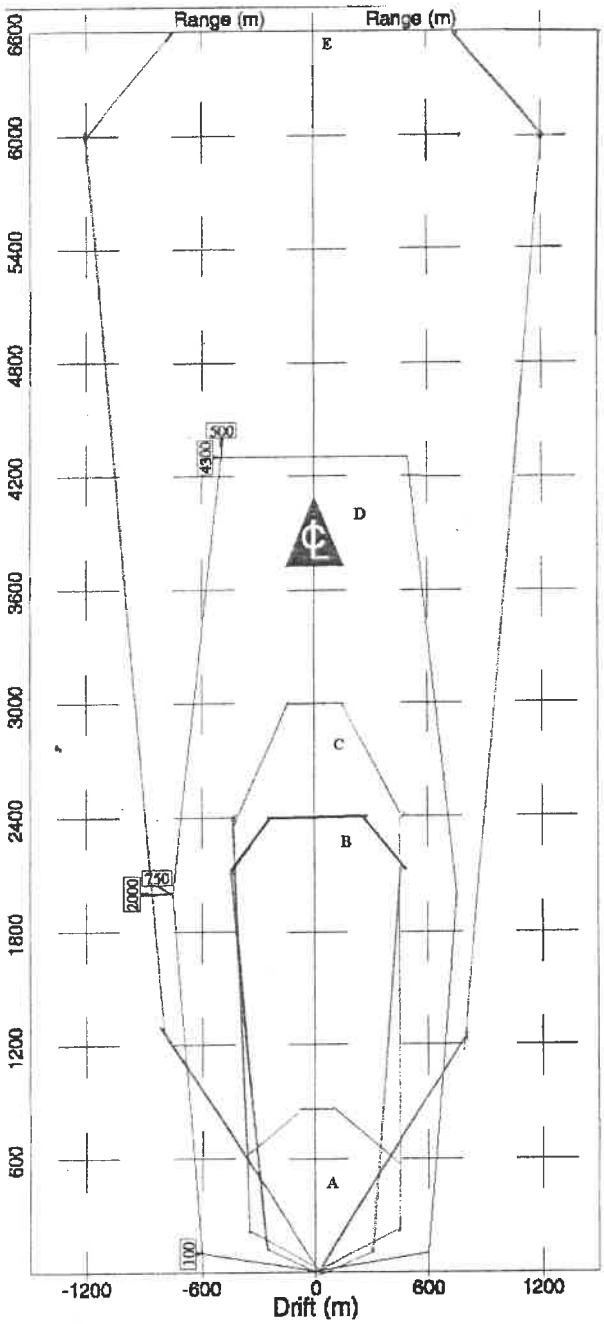


Figure 15 – Safety Area Templates for Field Rifle Ranges : A : .22 LRHV ; B : .223 Rem. (22-250, .30, .303, .32, .35) ; C : .308 Win. (.30-06, 7mm, 6.5, .270) ; D : .338 Lapua mag. (7mm mag., .300 mag., 8mm mag.) ; E : .50 Browning

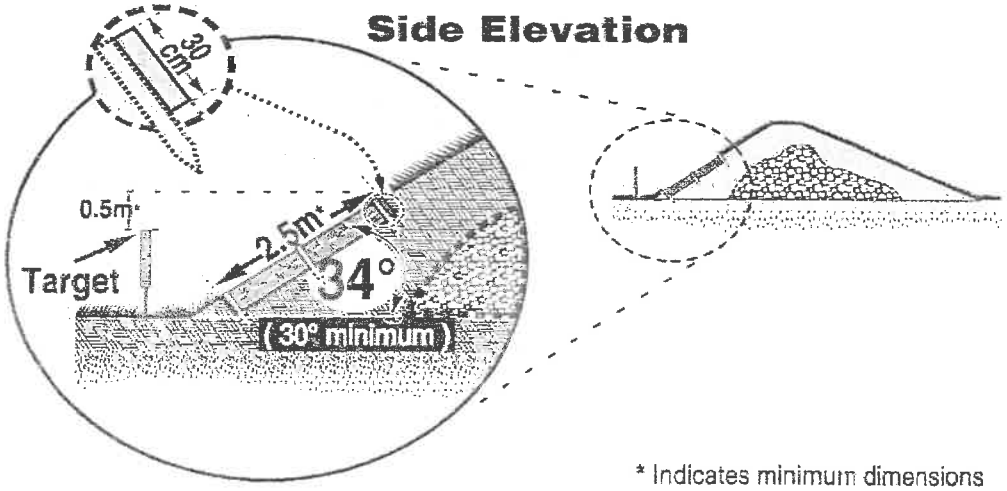
APPENDIX B

OPTIONAL DESIGNS FOR RANGES

BULLET CATCHERS

The use of inclined bullet catchers, which are similar to large inclined sand boxes, on the forward face of the backstop are optional. If used, they will serve as primary bullet impact areas. Bullet catcher are intended to minimize degradation on the slope of backstop due to bullet impact and to ease backstop maintenance (e.g. reshaping of the backstop face when bullet tunneling occurs) that is required periodically. They also ease the de-mining of lead and copper alloys from the backstop. Bullet catchers shall be at least 2.5 m in height, or exceed the target height by at least 0.5 m and exceed the target edges by 0.5 m. They can be built for each target position or run the length of the backstop.

If employed, they can be made of timber planking or logs. They *cannot* be made of steel, concrete or similar hard material. They should be *at least* 30 cm deep, filled with loose sand. The following is an example of a bullet catcher:



* Indicates minimum dimensions

APPENDIX B (CONTINUED)

OPTIONAL DESIGNS FOR RANGES

COVERED FIRING LINE

The firing line may be covered with a weather shelter, if so desired. If one is provided, it shall be of height and construction that it will not interfere with the shooter or the Range Officer during any part of their activities on the firing line (e.g. preparation, firing, supervision, etc.) and it shall not obscure the view of the active range area.

It should be noted that a shelter, although serving as protection from rain or sun rays, can increase noise resonance, reduce natural light, and can be drafty.

GROUND BAFFLES

If a range floor does not conform to 2.4 and 3.4, ground baffles, as per Section 8.6 may be utilized as an option to prevent ricochets.

APPENDIX C

PROVINCIAL FIREARMS ADVISORY COMMITTEE

Roger Aubut

Terry Burns

Richard DeBow

G.D. Calhoun

Wayde Clifford

Kenneth V. Cox

Ovila Doiron, *Deputy Chairperson*

Richard Doucette

Condé Grondin, *Chairperson*

Austin Estabrooks

Ross Faulkner

Bob Kierstead

Chris Kingston

Ellen MacGillivary

Ernest McCallum

John MacKay

John Moore

Jeb Newhouse

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John MacKay

John Moore

Jeb Newhouse

Dave Palmer

Cathy Vidler

REFERENCES

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2. *FIREARMS ACT REGULATIONS*, Department of Justice Canada, March 1998

3. Bill C-68, *STATUTES OF CANADA* 1995, December 5th , 1995

4. *RIFLE RANGE SPECIFICATIONS*, Department of Natural Resources

5. *THE RANGE SOURCE BOOK*, National Rifle Association

6. *BAFFLES, BERMS AND BACKSTOPS*, by David Luke, National Rifle Association

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Chief Provincial Firearms Office, Province of New Brunswick

Department of Natural Resources and Energy, Province of New Brunswick

Ovila Doiron, Champ de Tir – Cap-Pelé – Gun Range

Firearms Safety Is Everyone's Concern.

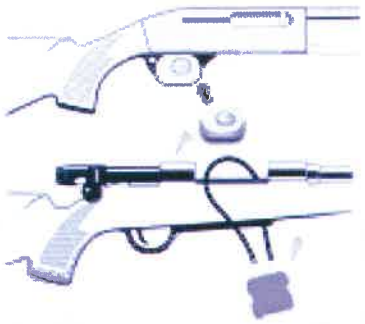
Storing and Transporting Your Hunting Rifles and Shotguns

Safe Storage

The firearm must be **unloaded, and**

Either:

1. Make the firearm **inoperable**
   a) by using a **secure locking device** such as a trigger lock or cable lock, **or**
   b) by removing the bolt or bolt-carrier,



OR

2. **Lock** the firearm in a sturdy, secure container or room that cannot easily be broken open or into.

Keep the **ammunition** separate, unless it is in a securely locked container. It can be kept in the same locked container as the firearm.

Safe Transport

The firearm must be **unloaded**, unless it is a muzzle-loading firearm being transported between hunting sites. In that case, its flint or firing-cap must be removed.

If left in an unattended vehicle:

(if no adult or minor with a minor's licence stays with the firearm)

- **Lock** the firearm in the trunk of the vehicle or in a similar compartment.
- If the vehicle does not have a trunk or similar lockable compartment, put your firearm out of sight inside the vehicle, and lock the vehicle.
- **In a remote wilderness area**, if the vehicle has no trunk or similar compartment that can be locked:
  - Put a secure locking device on the firearm (unless you need the firearm for predator control), **and**
  - Put the firearm out of sight.

For more information
Call **1 800 731-4000**
Internet Site: **www.cfc.gc.ca**
E-mail: **canadian.firearms@justice.gc.ca**

Canada

New Nouveau Brunswick
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