CHAPTER 9

THE 1908 DESIGN BARRACK RANGE

INTRODUCTION

0901. **General**. The 30 yard Barrack Range with a ricochet pit, 6 ft (1.8 m) deep at the target line, is one of two designs approved by War Office Instructions for The Care and Construction of Rifle Ranges 1908. Many of these NDA ranges built in barracks and garrisons are still in use today, **however the 30yd firing point is no longer to be used**. The range has been converted to have four firing points at 25, 20, 15 and 10 m.

0902. This Chapter is for range managers and inspectors only as all new barrack ranges are to be constructed in accordance with Chapter 8. This chapter describes the 1908 design barrack range and in particular it covers:

a.	Introduction		0901 - 0904
b.	Design		0905 - 0910
c.	Construction		
	(1)	Target area	0911 - 0916
	(2)	Range floor	0917 - 0920
	(3)	Firing points	0921 - 0923
	(4)	Lighting	0924
d.	Communications		0925
e.	Maintenance		0926 - 0929

0903. **Description**. All these ranges should now have been metricated for use as a 25m range. Modifications from the original design are described at paragraph 0906 and the modified range is illustrated in Figure 9-1.

0904. **Purpose.** This barrack range provides a local facility for limited firing practices up to 25 m. It is suitable for carrying out rifle and pistol practices as set out in the AOSP with the exception of CQM shoots.

DESIGN

0905. **General.** The design of this range has evolved over time and has proven since 1908 to provide a safe environment in which to undertake shooting practices within a barrack area.

0906. **Modifications.** The following modifications were added to the original design of this range:

a. **Canopy.** A canopy has been added to the bullet catcher to contain `pop-over'. This is the tendency for the occasional high velocity round to deform and ricochet vertically out of the sand bullet catcher. The canopy roof is to be constructed to prevent rounds passing through it. The 5mm steel plate fixed to the underside of a timber canopy provides protection for at least ½ the depth of sand and covering the full canopy width. Other impenetrable material, such as concrete, is also suitable.

b. **30yd Firing Point.** The range has been metricated with the addition of a 25 m firing point. Where the 30yd firing point still exists it is no longer used. The depressed LofS is maintained.

c. **Bullet Catcher Back Wall**. Inside the canopy a render coat of 1:4 cement / sand is applied to observe attrition and ease maintenance. See paragraph 0928.

0907. **Back-to-Back Ranges.** Some ranges were built back-to-back with the one stop butt wall. The wing walls had to be straight and their length increased to 5.1 m. For simultaneous use, canopies have been placed over the bullet catchers. A typical layout is shown in Figure 9-2.

0908. **SA Limitations**. Limitations on the maximum number of SA, ammunition and rates of fire that can be used on this range are given in Reference B (Pamphlet 21). These limitations give either an increased safety factor under difficult conditions or acknowledge that the design only caters for some practices and for stable aimed firing.

0909. **Shot Guns.** The range design is suitable for shot guns firing solid slug or buck shot. Where ranges have significant solid slug practices de-leading frequency may need to be increased to avoid the build up of lead at the MPI.

0910. **Mantlets**. The mantlet at the head of the ricochet pit may be with, or without a stepped slope of $>30^0$. Some ranges have stepped mantlets to facilitate the use of harmonisation targets, which are normally inserted into slots in the face of the mantlet.

CONSTRUCTION

TARGET AREA

0911. **Stop Butt Wall**

a. **Layout**. The stop butt wall consists of a central section at 1600 mils (90^0) to the LofF and two wing walls arched forward at 2844 mils (160^0). The standard four lane range was designed with the central section 7.4 m long. If additional firing lanes were required, this length was increased by 1.8 m for each additional lane but the length of the wing walls did not have to be increased.

b. **Materials.** The stop butt wall was normally constructed of solid (void free) Class B engineering brick with a minimum thickness of 225 mm or with materials which gave a similar resistance to shot penetration. Inspectors should ensure the brick used on these ranges

do not permit rounds to enter more than 10% of the back or wing wall structures. Where penetration is clearly greater than 10% from one strike refer to TAS(RE).

c. **Height**. A standard wall height of 7.865 m applied with a flat range floor. The excavation of a ricochet pit enabled the height of the stop butt wall to be reduced; the reduction was equal to the depth of the pit but the wall height was not to be lower than 6.065 m.

d. **Compliance**. The above is only valid for ranges that comply in all ballistic respects to the Standard Detail. In all other cases compliance is checked against Chapter 5.

0912. **Bullet Catcher.** A sand or granulated rubber bullet catcher is built over the entire central section of the stop butt wall. Its height is maintained at 2.3 m from the top of the target trench. The bullet catcher is built in the same way as that for the 25 m barrack range (see Chapter 8).

0913. **Canopy**. The canopy mentioned at paragraph 0906a should be added to all 25m barrack ranges. Otherwise a LDA is required in order to fire 7.62 mm and other high velocity ammunition that does not break up. The LDA has to extend laterally 100 m from each flank target, striking an arc to a line 100 m behind the stop butt in order to capture predicted pop-over. Without a canopy the range is classed as LDA (see Chapter 2). The facing edges of the canopy wing walls are to be protected with timber to prevent backsplash.

0914. **Targets**. The range may be used with all in-service figure and screen targets, including harmonisation, for SA (see Chapter 29). It is essential to the safety of this range that the target centre design height is maintained. Particular care is necessary when mounting harmonisation screens which must be located in sockets set lower down the mantlet. Where CQM shoots are authorised the RAU is to ensure all possible MPI falls within the bullet trap. The worst case practice will be CQM LFMT 3 m kneeling or squatting position. CQM shoots are not practical on ranges with a ricochet pit.

0915. **Turning Target Mechanisms**. The cable pull turning target mechanism originally provided on these ranges is difficult to operate and maintain. Two alternatives are available:

a. **Capstan Operated**. See Chapter 29.

b. **Electrically Operated**. These are described in Chapter 29. They may be permanently fitted and operated through a transformer to reduce mains electricity to 12 volts. Portable mechanisms require 12 volt batteries. Electrically, rather than capstan, operated is the system of choice as it is cheaper to buy and to install. Its speed and simplicity of operation improve the training value of the range.

0916. **Target Positions.** The number of targets per lane may be varied to meet training objectives but spacing should be:

a. 1.65 m minimum from the inside edge of the bullet catcher to the flank target centres.

b. 0.600 m minimum between target centres lane to lane.

c. Targets in each lane should be at least 375mm apart.

d. Target centre height on this range is fixed at 875mm (C).

Note: Other layouts may be adopted for pistol practices but sub-paragraph a. above remains the minimum.

RANGE FLOOR

0917. **Ricochet Pit.** The excavation of a 1.8 m ricochet pit allowed the height of the stop butt wall to be reduced. This was justified by the effect which the pit has in:

a. Reducing the number of ricochets from ground strike.

b. Reducing the angle of strike and thus lowering the angle of ricochet.

c. Moving the point of strike further down-range to help ricochet containment.

0918. **Configuration**. The range floor is surfaced with a minimum of 150 mm of soil free from large stones (> 30 mm in any dimension). It has to be firm, free draining and should be bound with grass or similar ground cover which is kept cut short. Any paths constructed are to be of non ricochet inducing material.

0919. **Side Walls and Banks**. The range was designed to safely contain all acceptable aimer deviation and ricochet. It therefore follows that, with proper range discipline and preparatory training, no hazard is predicted beyond the range floor. However, if it is necessary to increase the confidence of people adjacent to the range, a solid or screen wall may be provided. Earth banks may be used to screen a range provided the toe of the bank is beyond the range floor; otherwise a round striking its sloped surface may leave the range.

0920. **Fences and Signs**. All access to the range when in use must be controlled. Ranges that are in open access areas, particularly those where woods or shrubs come close to the stop butt or side of the range should be fenced and signed to ensure access during firing is controlled. The same measures will be necessary where ranges with sloping earth bunds protect the sides of the range. Local risk assessments will identify areas where access will need to be controlled. Where fences are deemed to be necessary prohibition signs will also be required. A flag pole for a red range in use flag is provided where it can best be seen. If night firing is to be conducted, a red light is fitted to the flag pole. If the flag pole is on the stop butt wall, it is to be made of non-ricochet inducing material.

FIRING POINTS

0921. **25 m Firing Points**. The 25 m firing point is raised to 450 mm above ground level at the target line so as to ensure a depressed LofS from the prone position. It should also have a low maintenance surface that encourages the firer to take up a comfortable fire position.

0922. **Other Firing Points**. The 20, 15 and 10 m firing points are for firing weapons from the standing and kneeling positions only. These firing points are not normally specially surfaced.

0923. **Distance and Lane Markers.** Timber markers should be suitably positioned to show firing distances and lane numbers on the firing points.

LIGHTING

0924. The range may be provided with lighting for night practices but it was not designed for low light or LNV shooting. Where required the range is to be suitably illuminated to permit adequate visibility.

COMMUNICATIONS

0925. A means of summoning the emergency services, ideally a land laid telephone, is to be available.

MAINTENANCE

0926. **General**. It is essential to the safety of the range that the ricochet pit is maintained to its correct profile, depth and width. The bank which forms a mantlet at the end of the pit must be maintained at 600 mils (34^0). The pit should be well drained but a shallow collection of water at the very bottom of the pit is often unavoidable. However, a build-up of sediment in the drainage area must be avoided as it will eventually reduce the depth of the pit.

a. **Range Warden.** See Reference A1.

b. **Property Management.** General inspection with particular emphasis on:

(1) Stop butt, canopy and wing walls.

(2) Fire trenches.

(3) Fences and sign posts (See Chapter 2).

c. **Equipment Management.** Repairing and servicing equipment installed by single Service contract.

0927. **Frequency**. Proper maintenance is dependent upon good liaison between the Range Warden and the RAU, and on properly scheduled maintenance periods. A heavily used range may need one day's maintenance each week plus one or two days' maintenance by the Range Warden each month. Two closed periods of a week or so may be needed each year for building and earthworks repair; this work should be combined with the contract repair of equipment.

0928. **Stop Butt Wall.** Bullet strike on the stop butt wall above or beside the bullet catcher are to be recorded in the Range Log (MOD Form 906). If such incidents occur frequently, the range configuration may need to be checked by TAS(RE). Where strike occurs shot marks should be made good and to ease inspection, the wall should be painted with an external sand or white paint. The bullet catcher back wall above the sand should be covered with a weak 12mm(T) thick render mix of 1:4 Cement / sand to ease repairs.

0929. **Bullet Catcher**. The requirements for maintaining the bullet catcher are given in Chapter 2.

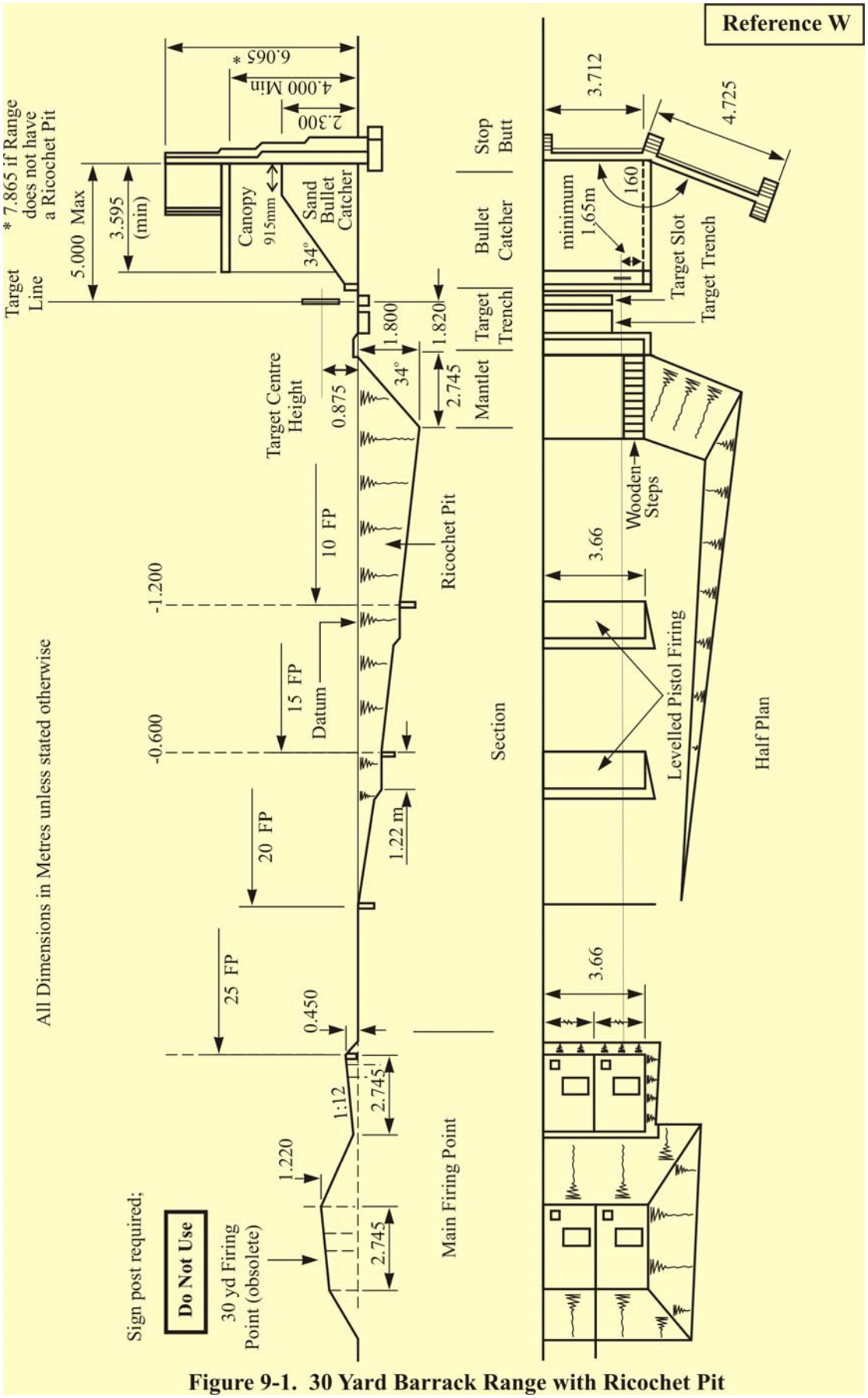

Figure 9-1. 30 Yard Barrack Range with Ricochet Pit

Reference W

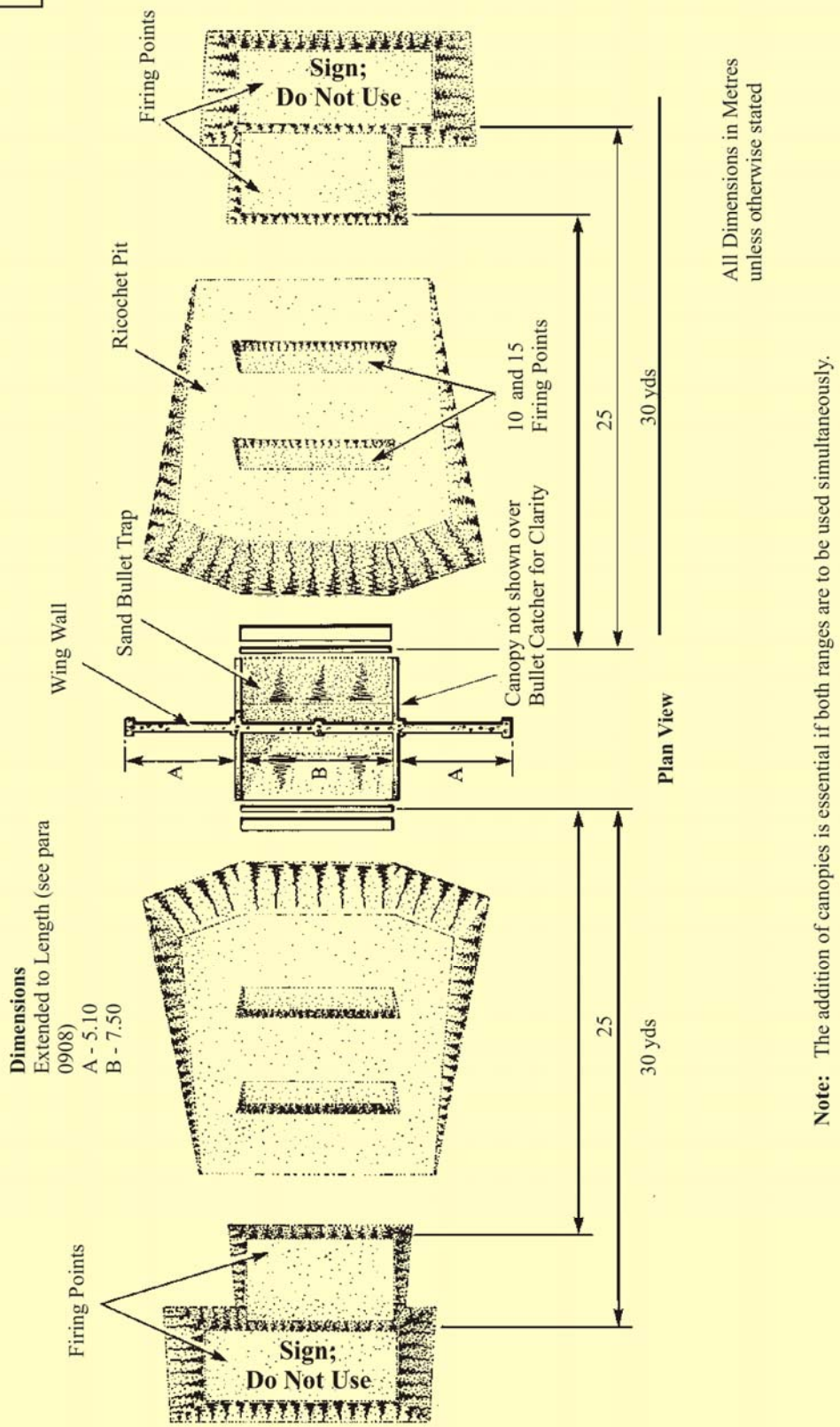

Figure 9-2. Back-to-Back Barrack Ranges