
Training Ranges

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Headquarters, Department of the Army

Appendix D

RANGE DIAGRAMS

Table D-1. Range operations support matrix

Figure #	Facility Category Code (FCC)	Range Description	No Buildings Required										After Action Review (17123)						
			Range Tower, 657 sq/ft (17971)	Range Tower, Instrumented, 1544 sq/ft (17971)	Operations Storage, Large, 1800 sq/ft (17122)	Operations Storage, Small, 800 sq/ft (17122)	Classroom Facility, 800 sq/ft (17123)	Latrine, Aerated, 330 sq/ft or Water, 550 sq/ft (73075)	Bleacher Enclosure, 726 sq/ft (TRADOC, 1078 sq/ft) (75061)	Covered Mess, 800 sq/ft (TRADOC, 1413 sq/ft) (17139)	Ammo Breakdown, 185 sq/ft (120 sq/ft enclosed) (17122)	AAR, Small, 1064 sq/ft (960 sq/ft enclosed)	AAR, Large, 1776 sq/ft	ROC / AAR, CACTF/CTF, 4176 sq/ft	AAR, Instrumented Range, 3024 sq/ft	Ammo Loading Dock, 283 sq/ft (14970)	Instrumentation Dock, 900 sq/ft (100 sq/ft enclosed) (14970)	Bivouac Area (17720)	Unit Staging Area (85212)
1	17801	25m Zero	X					X	X	X	X								
2	17803	Automated Field Fire Range	X			X	X	X	X	X	X								
3	17805	Automated Record Fire Range	X			X	X	X	X	X	X								
4	17806	Modified Record Fire Range	X			X	X	X	X	X	X								
5	17809	Qualification Training Range	X			X	X	X	X	X	X								
6	17810	Known Distance Range	X			X	X	X	X	X	X								
7	17812	Automated Sniper Field Fire Range	X			X	X	X	X	X	X								
8	17816	Bayonet Assault Course				X		X		X									
9	17822	CPQC/MPFQC	X			X	X	X	X	X	X								
10	17829	Heavy Sniper Range	X			X	X	X	X	X	X								
11	17833	Multipurpose Machine Gun Range	X			X	X	X	X	X	X								
12	17842	LAW / AT-4 Range						X											
13	17845	Antiarmor Tracking and Live Fire	X			X	X	X	X	X						X		X	X
14	17852	Mortar Range	X																
15	17856	Field Artillery Indirect Range	X																
16	17858	Scout / Recce Gunnery Complex	X**		X			X	X	X		X				X		X	X
17	17859	Digital Multipurpose Training Range		X	X			X	X	X					X	X	X	X	X
17	17865	Multipurpose Training Range	X**		X			X	X	X		X				X		X	X
18	17860	Digital Multipurpose Range Complex		X	X			X	X	X					X	X	X	X	X
18	17868	Multipurpose Range Complex	X**		X			X	X	X		X				X		X	X
19	17721	Digital Air / Ground Integration Rg		X	X			X	X	X					X	X	X	X	X
20	17862	Tank / FV Scaled Gunnery Range	X			X		X		X									
21	17863	Tank / FV Stationary Gunnery Range	X			X	X	X	X	X						X			X

** - Includes two floors - Top for Range Operations, Bottom for Evaluations. 802 square feet.
 Building sizes are for reference only; refer to the Range Design Guide for the latest design standards -
 (<http://hnd.usace.army.mil/rdg/InterTemplate.aspx>)

Table D-1. Range operations support matrix (continued)

Figure #	Facility Category Code (FCC)	Range Description	No Buildings Required		Range Ops Center (ROC)		After Action Review (17123)												
			Range Tower, 657 sq/ft (17971)	Range Tower, Instrumented, 1544 sq/ft (17971)	Operations Storage, Large, 1800 sq/ft (17122)	Operations Storage, Small, 800 sq/ft (17122)	Classroom Facility, 800 sq/ft (17123)	Latrine, Aerated, 330 sq/ft or Water, 550 sq/ft (73075)	Bleacher Enclosure, 726 sq/ft (TRADOC, 1078 sq/ft) (75061)	Covered Mess, 800 sq/ft (TRADOC, 1413 sq/ft) (17139)	Ammo Breakdown, 185 sq/ft (120 sq/ft enclosed) (17122)	AAR, Small, 1064 sq/ft (960 sq/ft enclosed)	AAR, Large, 1776 sq/ft	ROC / AAR, CACTF/CTF, 4176 sq/ft	AAR, Instrumented Range, 3024 sq/ft	Ammo Loading Dock, 283 sq/ft (14970)	Instrumentation Dock, 900 sq/ft (100 sq/ft enclosed) (14970)	Bivouac Area (17720)	Unit Staging Area (85212)
22	17870	Battle Area Complex		X	X		X	X	X	X					X	X	X	X	X
23	17872	Air Defense Missile Range	X			X	X	X											
24	17878	Urban Assault Course				X	X			X									
25	17879	Live Fire Exercise Shoothouse				X	X			X	X								
26	17880	Live Fire Exercise Breach Facility					X												
27	17882	Hand Grenade Qualification Course					X	X	X										
28	17883	Hand Grenade Familiarization Range					X	X	X	X									
29	17884	Grenade Launcher Range	X				X	X	X	X									
30	17885	Light Demolition Range					X			X									
31	17891	Infiltration Course	X		X		X	X	X										
32	17892	Fire and Movement Range	X		X		X	X	X	X									
33	17893	Squad Defense Range	X		X	X	X	X	X	X									
34	17895	Infantry Squad Battle Course	X		X	X	X	X	X	X									
35	17897	Infantry Platoon Battle Course	X		X	X	X	X	X	X									
36	17901	CACTF				X	X	X				X							
37	17996	Collective Training Facility				X	X	X				X							
38	17771	Convoy Live Fire Range w/ ECP				X	X			X									
39	17910	Boresight, Screening, Harmonization	X				X												
40	17912	Aerial Gunnery Range	X**		X		X	X	X	X		X						X	X

** - Includes two floors - Top for Range Operations, Bottom for Evaluations. 802 square feet. Building sizes are for reference only; refer to the Range Design Guide for the latest design standards - (<http://hnd.usace.army.mil/rdg/InterTemplate.aspx>)

Table D-1. Range operations support matrix (continued)

Figure #	Facility Category Code (FCC)	Range Description	MAT - Moving Armor Target	SAT - Stationary Armor Target	MIT - Moving Infantry Target, 15m	MIT - Moving Infantry Target, 40m	SIT - Stationary Infantry Target	DTA SIT - Double Target Arm Stationary Infantry Target	HUT - Human Urban Target	Facade (w/ 3 SITs each, included in SIT column)	Urban Cluster, 5 & 7 Building	Trench Line, 50-60m	Machine Gun Bunker (w/ SES included in SES total)	Breaching Obstacle	BES - Battle Effects Simulator	MSD - Mortar Simulation Device	SES - Sound Effects Simulator	Range Depth in Meters (maximum)	Lanes
1	17801	25m Zero																25	32
2	17803	Automated Field Fire Range					96 [^]											300	32
3	17805	Automated Record Fire Range					112 [^]											300	16
4	17806	Modified Record Fire Range					144 [^]											300	16
5	17809	Qualification Training Range		20	24		350	24							20			1,500	41
6	17810	Known Distance Range																1,000	32
7	17812	Automated Sniper Field Fire Range			24		32											1,000	4
8	17816	Bayonet Assault Course																	9
9	17822	CPQC/MPFQC					120											39	15
10	17829	Heavy Sniper Range	2	14			3								16			1,775	1
11	17833	Multipurpose Machine Gun Range		20	24		98	24							20			1,500	10
12	17842	LAW / AT-4 Range	2										2		4		2	600	
13	17845	Antiarmor Tracking and Live Fire	5	12											17			4,000	1
14	17852	Mortar Range																6,000	1
15	17856	Field Artillery Indirect Range																25,000	1
16	17858	Scout / Recce Gunnery Complex	4	35	8		154			2					39	4	12	2,100	1
17	17859	Digital Multipurpose Training Range	6	30		4	146			8	1	2	2		36	4	20	3,500	1
17	17865	Multipurpose Training Range	6	30		4	146			8	1	2	2		36	4	20	3,500	1
18	17860	Digital Multipurpose Range Complex	12*	80*	38	7	306			12	2	4	4	2	92*	15	49	5,000*	3
18	17868	Multipurpose Range Complex	12*	80*	38	7	306			12	2	4	4	2	92*	15	49	5,000*	3
19	17721	Digital Air / Ground Integration Rg	8*	50*	28*	7	246*			12	2	4	4	2	58*	6	39*	6,000*	2
20	17862	Tank / FV Scaled Gunnery Range			8		19			1								400	1
21	17863	Tank / FV Stationary Gunnery Range	4	25	7		42										29	3,000	1

* - Meets Threshold range footprint. Quantity may increase with addition of objective areas.

[^] - LOMAH use authorized on IET Installations only.

Standard Facade consists of (Combined - One / Two Story Facades)

Table D-1. Range operations support matrix (continued)

Figure #	Facility Category Code (FCC)	Range Description	MAT - Moving Armor Target	SAT - Stationary Armor Target	MIT - Moving Infantry Target, 15m	MIT - Moving Infantry Target, 40m	SIT - Stationary Infantry Target	DTA SIT - Double Target Arm Stationary Infantry Target	HUT - Human Urban Target	Facade (w/ 3 SITs each, included in SIT column)	Urban Cluster, 5 & 7 Building	Trench Line, 50-60m	Machine Gun Bunker (w/ SES included in SES total)	Breaching Obstacle	BES - Battle Effects Simulator	MSD - Mortar Simulation Device	SES - Sound Effects Simulator	Range Depth in Meters (maximum)	Lanes
22	17870	Battle Area Complex	6	43	14		222			4	2	2	2	4	49	4	27	4,000	2
23	17872	Air Defense Missile Range																	4
24	17878	Urban Assault Course					10	26	1										
25	17879	Live Fire Exercise Shoothouse						10											
26	17880	Live Fire Exercise Breach Facility																	
27	17882	Hand Grenade Qualification Course																	
28	17883	Hand Grenade Familiarization Range																	
29	17884	Grenade Launcher Range																	
30	17885	Light Demolition Range																	
31	17891	Infiltration Course																135	
32	17892	Fire and Movement Range					24											150	4
33	17893	Squad Defense Range					31											300	5
34	17895	Infantry Squad Battle Course	1	6	6		20				2	5		7	10	15		1,000	
35	17897	Infantry Platoon Battle Course	1	6	14		43				1	9		7	8	17		4,000	
36	17901	CACTF		9			15	30						9				1,500	
37	17996	Collective Training Facility		9			10	20						9				1,500	
38	17771	Convoy Live Fire Range w/ ECP	4	5	3		43		6					9					
39	17910	Boresight, Screening, Harmonization		8			8											1,500	
40	17912	Aerial Gunnery Range	8*	50*	35*		246*		12					58		45		6,000*	

* - Meets Threshold range footprint. Quantity may increase with addition of objective areas.
Standard Facade consists of (Combined - One / Two Story Facades)

FCC 17801 BASIC 10-METER/25-METER FIRING RANGE (ZERO)

This range is used to train individual Soldiers on the skills necessary to align the sights and practice basic marksmanship techniques against stationary targets. The range is designed for training shot-grouping and zeroing exercises with the M16 and M4 series rifles as well as crew-served machine guns. This range is also used for short-range marksmanship (SRM) training and qualification.

Primary features include—

- 32 target frames at 25 meters.
- 16 target frames at 10 meters.
- 32 foxholes.

This range requires no automation. All targets are fixed at 25 meters from the firing line for M16/M4 and fixed at 10 meters for machine gun.

Associated range operations and control facilities:

Standard small arms range operations and control area (SAROCA) facilities.
Exclude - Operations/storage building (17122) and Classroom Facility (17123).

Requirement document: FM 3-22.9, FM 3-22.65, FM 3-22.68, FM 3-05.213

Additional information: None

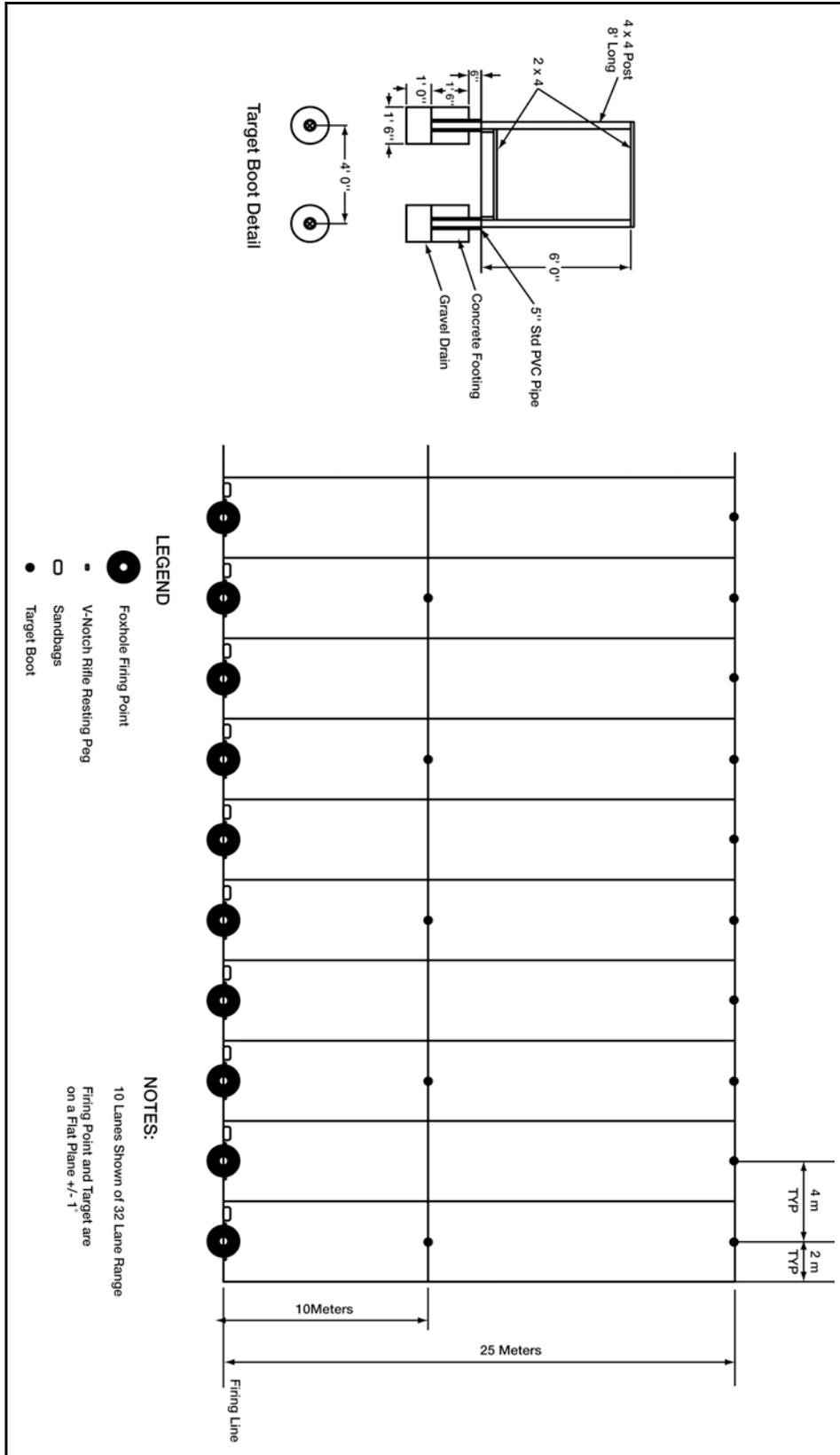


Figure D-1. Basic 10-meter/25-meter firing range (zero)

FCC 17803 AUTOMATED FIELD FIRE (AFF) RANGE

This range is used to train and familiarize Soldiers on the skills necessary to identify, engage, and hit stationary infantry targets with the M16 and M4 series rifles.

Primary features include—

96 stationary infantry targets.

32 foxhole positions.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.9

Additional information: All stationary infantry targets will be equipped with a muzzle flash simulator. This range can be equipped with Location of miss and hit (LOMAH) technology for initial entry training (IET) only.

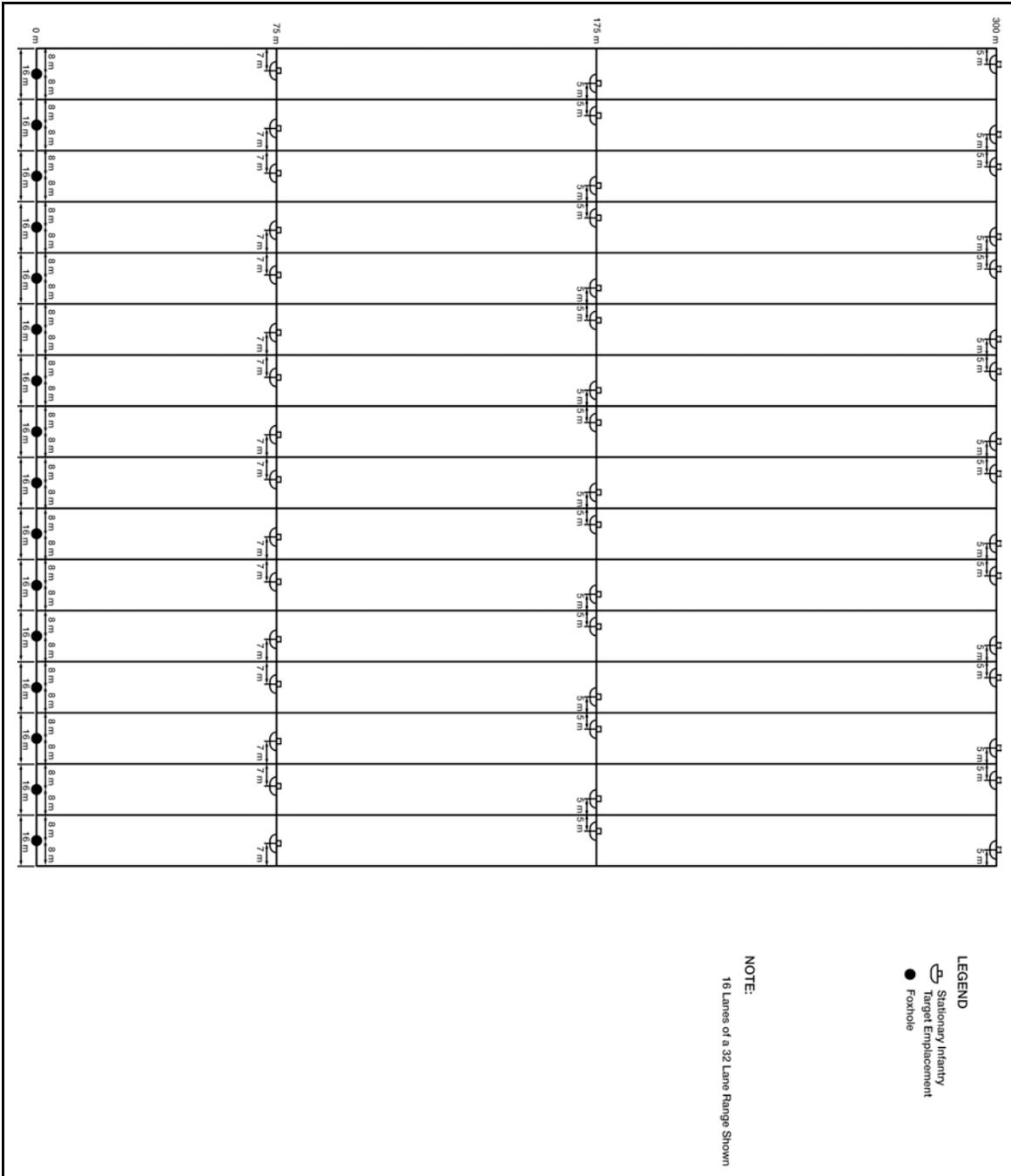


Figure D-2. Automated field fire range

FCC 17805 AUTOMATED RECORD FIRE (ARF) RANGE

This range is used to train and test individual Soldiers on the skills necessary to identify, engage, and defeat stationary infantry targets for day/night qualification requirements with the M16 and M4 series rifles.

Primary features include—

- 112 stationary infantry targets.
- 16 foxholes.
- 32 target boots.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.9

Additional information: Night firing is accomplished from the baseline, firing at the 50-meter targets. All stationary infantry targets will be equipped with a muzzle flash simulator and have the capability to use thermal blankets. Target boots are 4 meters apart and placed 25 meters from the baseline.

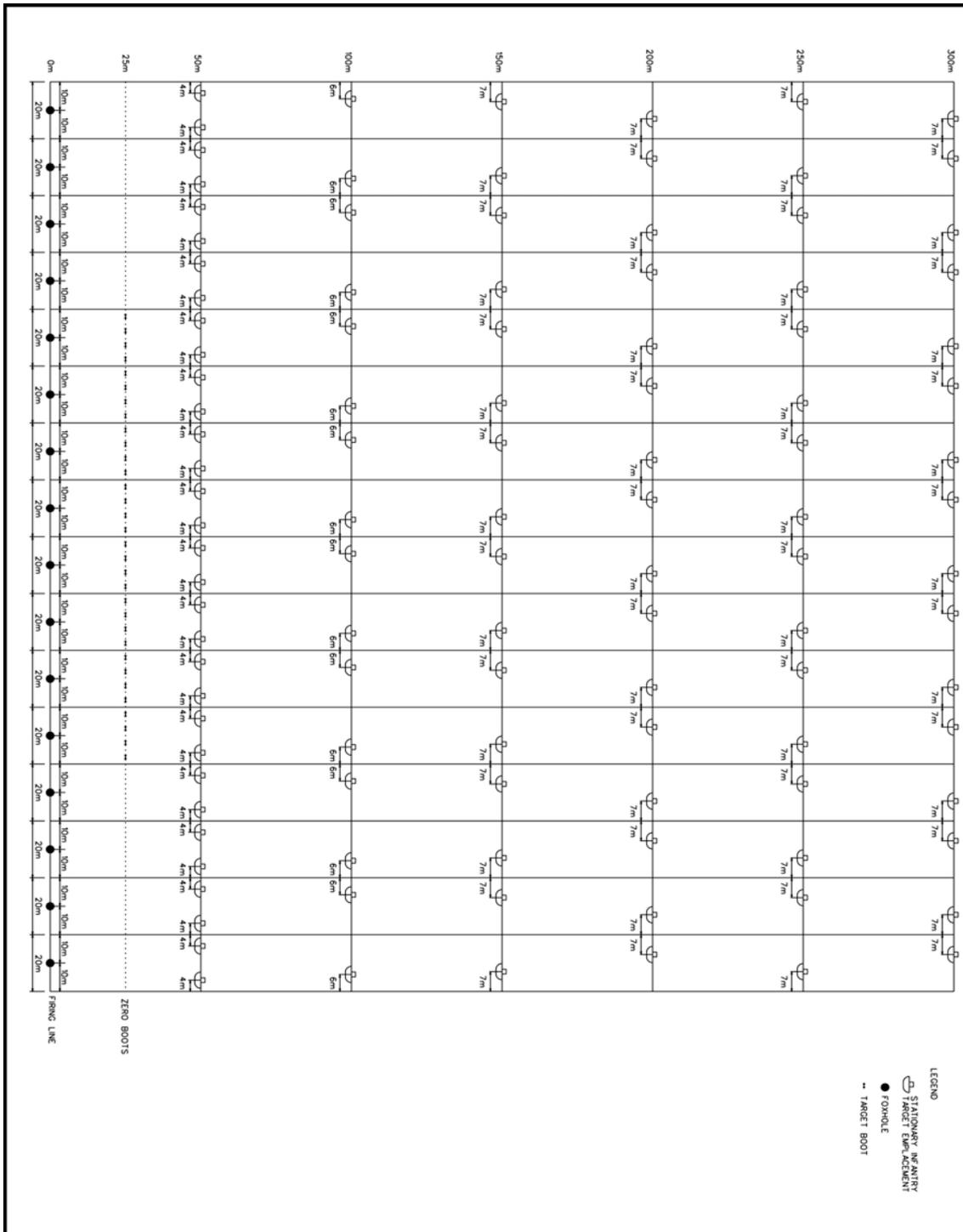


Figure D-3. Automated record fire range

FCC 17806 MODIFIED RECORD FIRE (MRF) RANGE

This range is used to train and test individual Soldiers on the skills necessary to identify, engage, and defeat stationary infantry targets for day/night qualification requirements with the M16 and M4 series rifles. This range combines the capabilities of the automated field fire (17803) and automated record fire (17805) to reduce land and maintenance requirements and increase efficiencies.

Primary features include—

- 144 stationary infantry targets.
- 16 foxholes.
- 32 target boots.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.9

Additional Information: Night firing accomplished from the baseline. All stationary infantry targets are equipped with a muzzle flash simulator and have the capability to use thermal blankets. Target boots are 4 meters apart and placed 25 meters from the baseline.

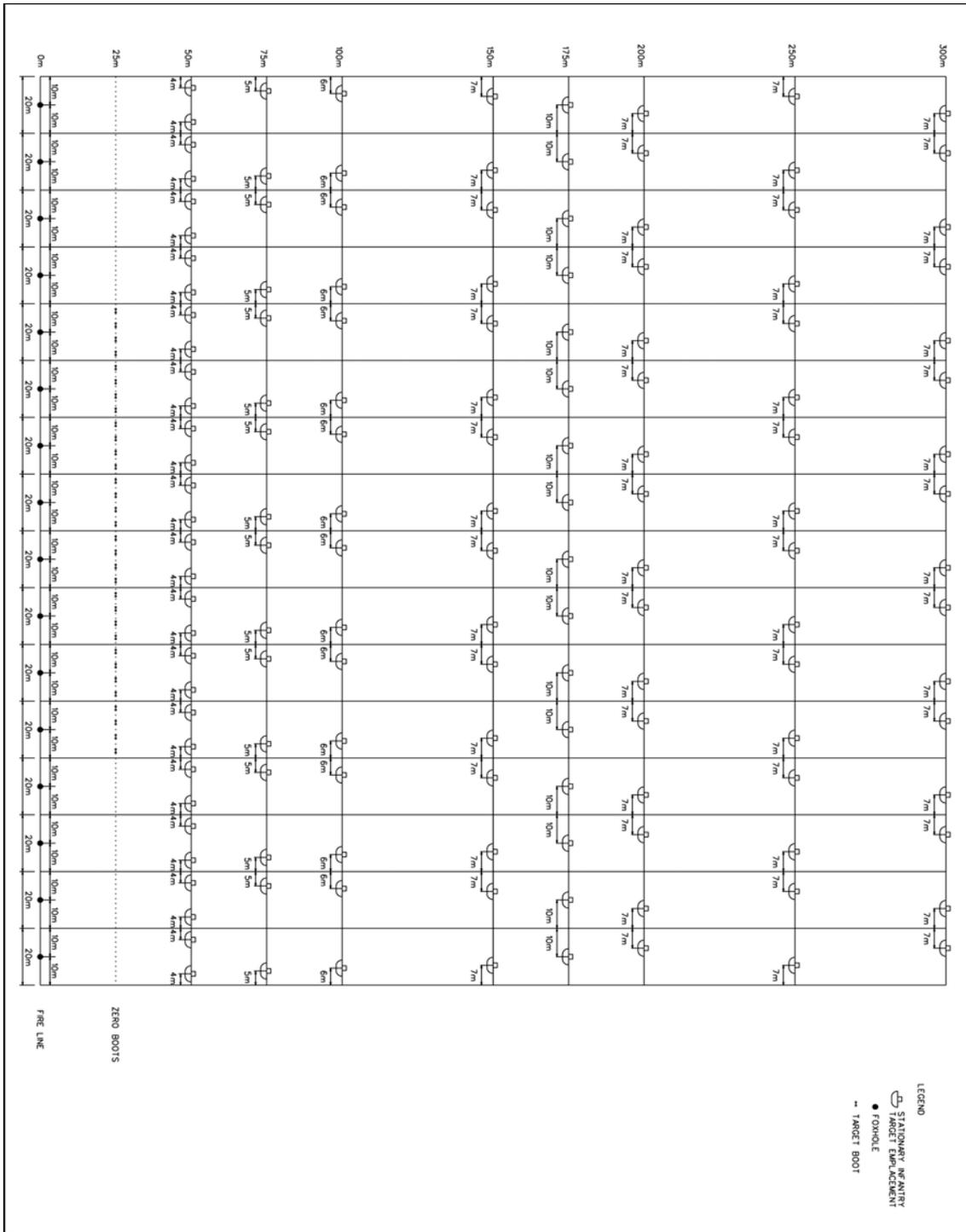


Figure D-4. Modified record fire range

FCC 17809 QUALIFICATION TRAINING RANGE (QTR)

This range is used to train and test Soldiers on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry targets along with stationary armor targets in a tactical array using the M16/M4, M9 pistol, M249 squad automatic weapon (SAW), M60 MG, M240B MG, MK19, M21/M24/M110 sniper weapons and the M2 MG. This range combines the capabilities of modified record fire range (17806), automated sniper field fire range (17812), combat pistol/military police firearms qualification course (17822), and the multipurpose machine gun range (17833) to centralize training and reduce land, maintenance, and unit overhead requirements.

Primary features include—

- 15 lanes combat pistol / military police firearms qualification.
- 4 lanes sniper field fire.
- 16 lanes modified record fire.
- 10 lanes multipurpose machine gun.
- 32 Lanes rifle/machine gun zero.
- 350 stationary infantry targets.
- 24 double target arm – stationary infantry targets.
- 24 moving infantry targets
- 20 stationary armor targets.
- 20 iron maiden targets.

Note: 26 stationary infantry emplacements are widened to support two target mechanisms.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.27, FM 3-22.9, FM 3-22.10, FM 19-10, FM 3-22.65, FM 3-22.68

Additional information: This range enhances throughput capability for units with multiple weapons densities by consolidating unit efforts to operating one training facility.* The primary users for this range are the Reserve and NGB. All stationary/moving infantry targets (excluding CPQC targets) are equipped with muzzle flash simulators. Target boots are placed in front of the MRF firing positions at 10 and 25 meters. All stationary infantry targets associated with the modified record fire will have the capability to use thermal blankets.

***Note:** This range is configured with the capabilities overlaid on the same footprint. There will be no separation of the individual qualification components.

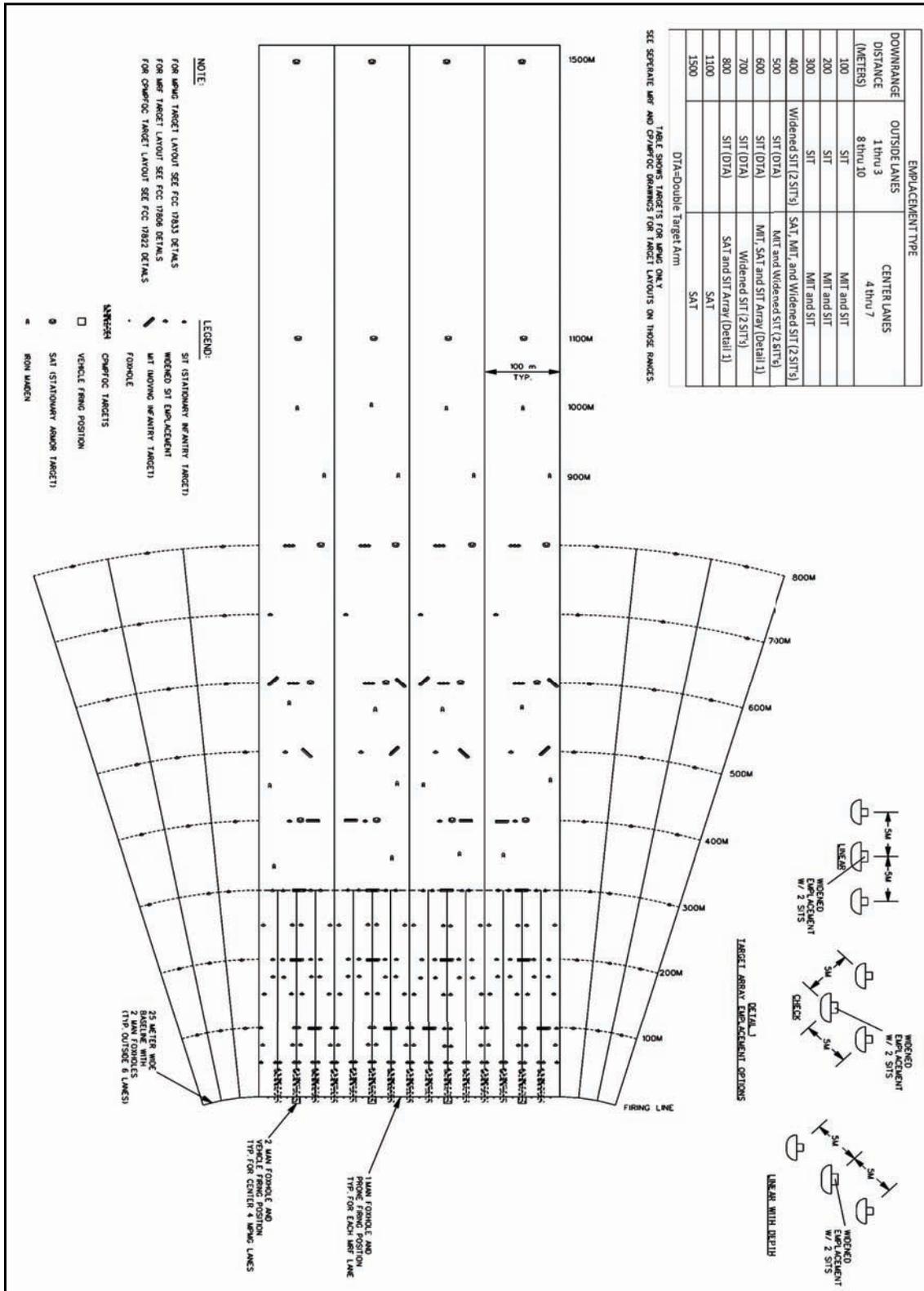


Figure D-5. Qualification training range

FCC 17810 KNOWN DISTANCE (KD) RANGE

This range is designed for training advanced rifle marksmanship and target engagement techniques with immediate downrange feedback and competition. This range is used to train and familiarize Soldiers on the skills necessary to identify, calculate distance, engage, and hit targets in a static array out to 1,000 meters. It is also used for squad-designated marksmanship (SDM) training and certification. The range firing points are graduated in 100-meter increments from 100 to 1,000 meters.

Primary features include—

- 32 target lifting devices.
- 32 firing lanes (10-meter width).

All targets are sliding target frame, paraleg carrier, or fully automated based on installation senior mission commander and ACOM, ASCC or DRU range manager. LOMAH technology is authorized for TRADOC installations only.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.9, FM 3-22.10, FM 3-22.68

Additional information: This range can be used for automatic rifle practice; basic and advance rifle marksmanship; designated marksman; and sniper training.

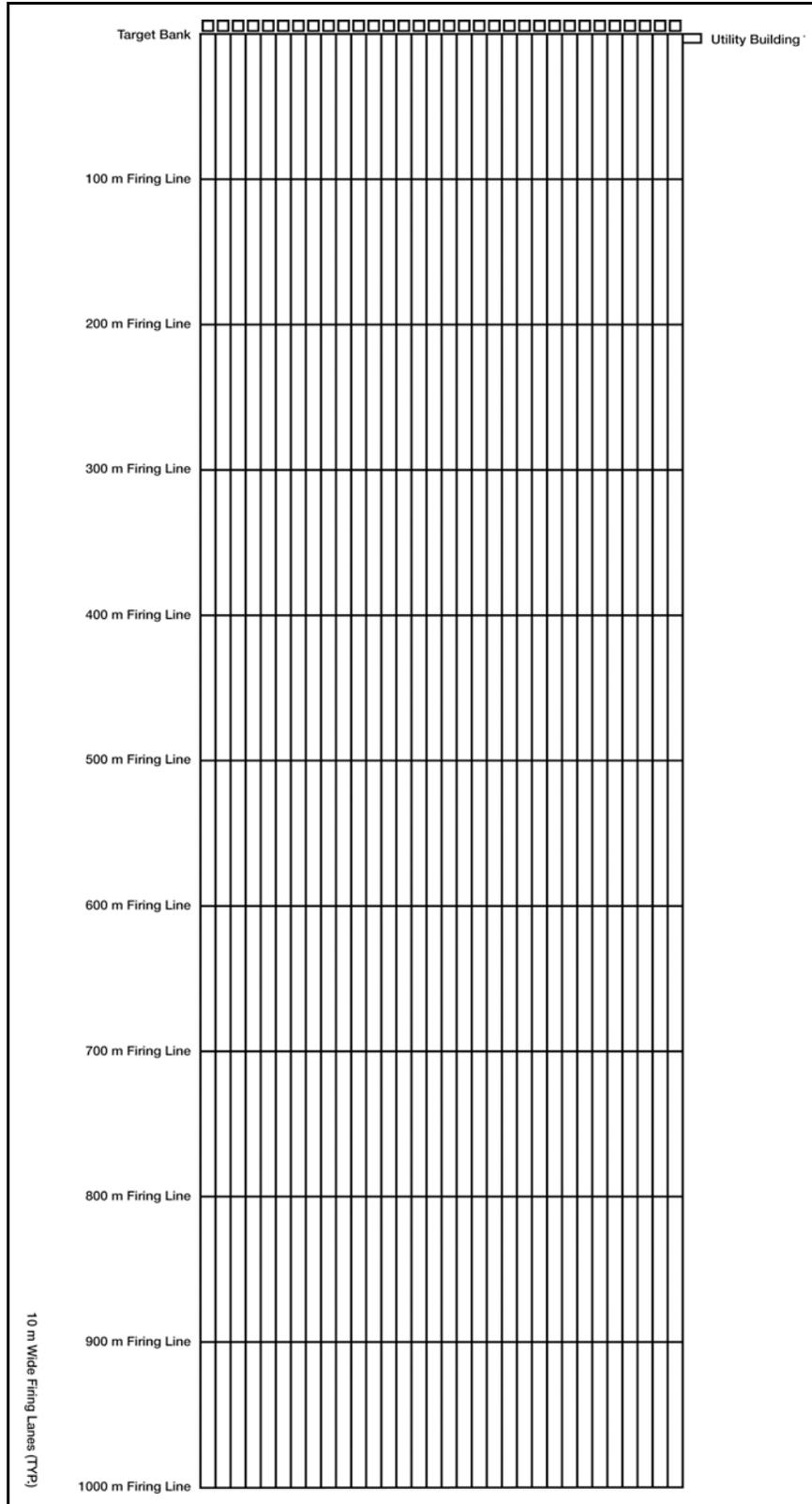


Figure D-6. KD range

FCC 17812 AUTOMATED SNIPER FIELD FIRE (SFF) RANGE

This range is used to train and test Soldiers on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry targets in a tactical array. This range is designed to satisfy the training and qualification requirements of the M24 sniper weapon system and M110 semi-automatic sniper system.

Primary features include—

- 32 stationary infantry targets.
- 24 moving infantry targets.
- 20 iron maiden targets.
- 4 firing positions.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.10

Additional information: Natural vegetation is required in the target area to provide realistic natural obstacles for the sniper to negotiate.

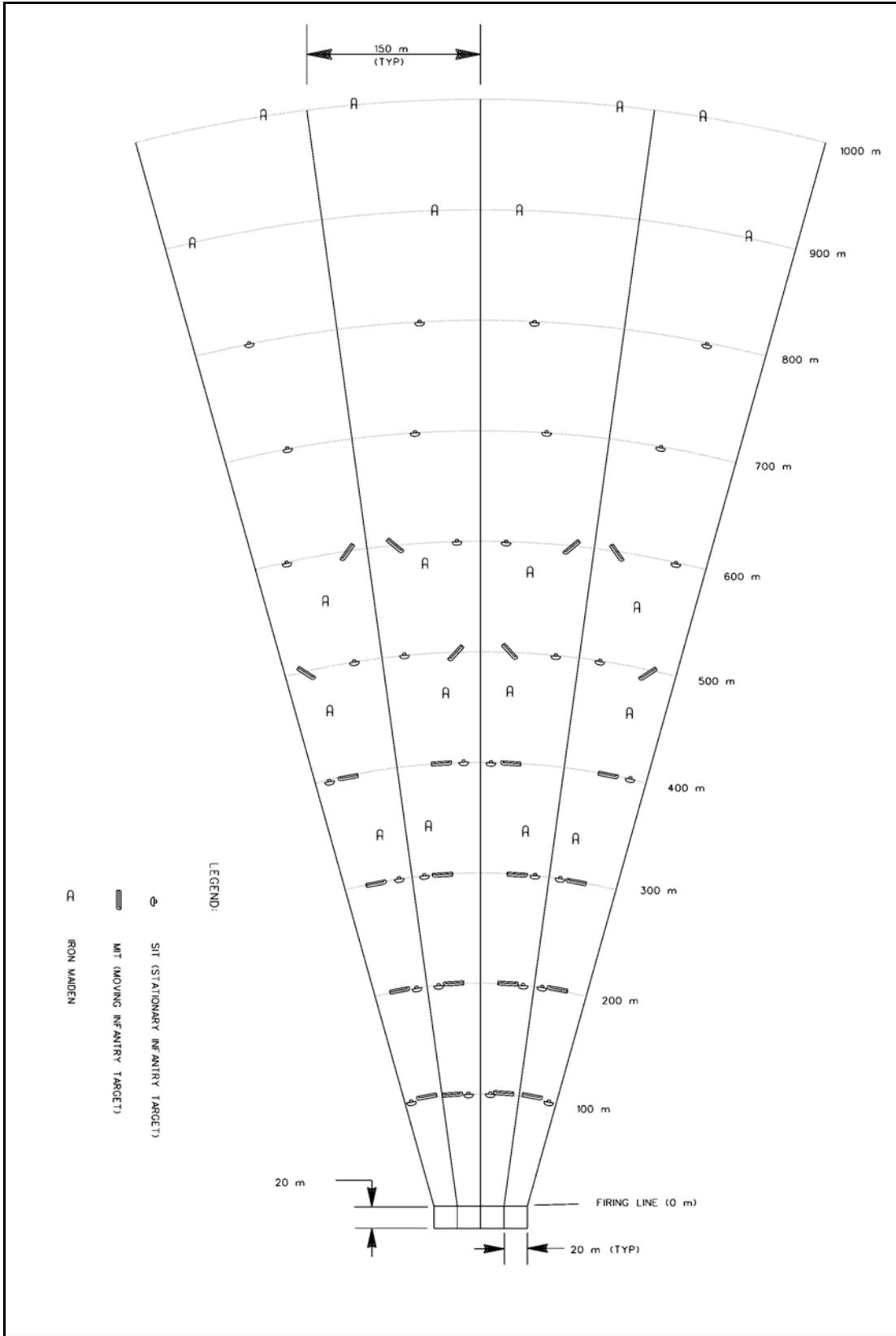


Figure D-7. Automated sniper field fire range

FCC 17816 BAYONET ASSAULT COURSE

This facility is used to train individual Soldiers in assault techniques using a rifle and bayonet against dummy silhouettes as well as negotiating various obstacles.

Primary features include—

9 lanes.

72 dummy silhouettes.

This facility requires no automation.

Associated range operations and control facilities:

Operations/storage building (17122)

Latrine (73075)

Covered mess (17116)

Requirement document: FM 3-25.150

Additional information: The number of lanes may vary due to available terrain and the throughput capacity of a particular installation.

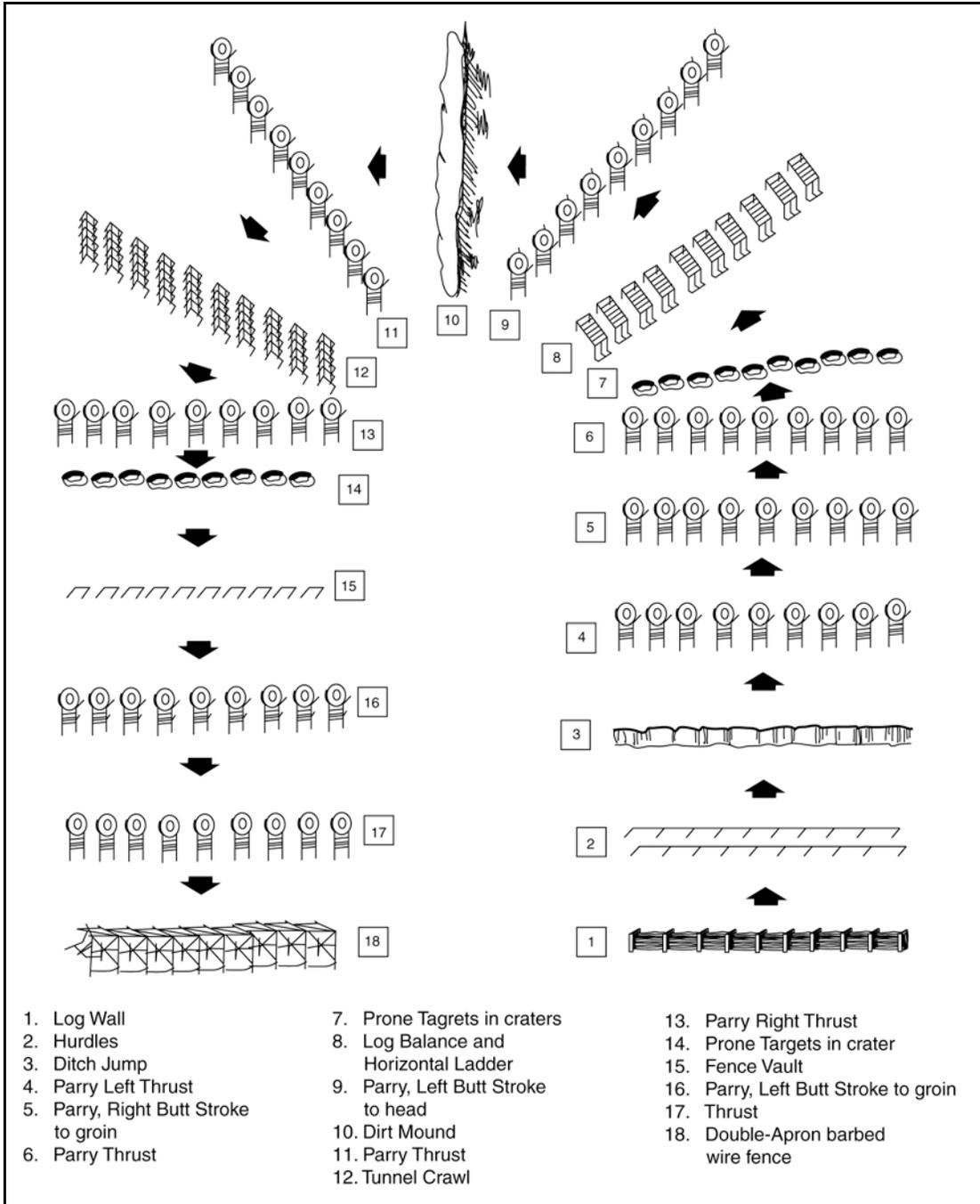


Figure D-8. Bayonet assault course

FCC 17822 AUTOMATED COMBAT PISTOL/MILITARY POLICE FIREARMS QUALIFICATION COURSE (CPQC/MPFQC)

This range is used to train and test Soldiers on the skills necessary to detect, identify, engage, and defeat stationary targets in a tactical array. The complex satisfies the training and qualification requirements of the 9-mm, .38-caliber, and .45-caliber pistols.

Primary features include—

- 120 stationary infantry targets.
- 15 firing lanes.
- 15 barricades (military police [MP] qualification).

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-23.35, FM 19-10

Additional information: None

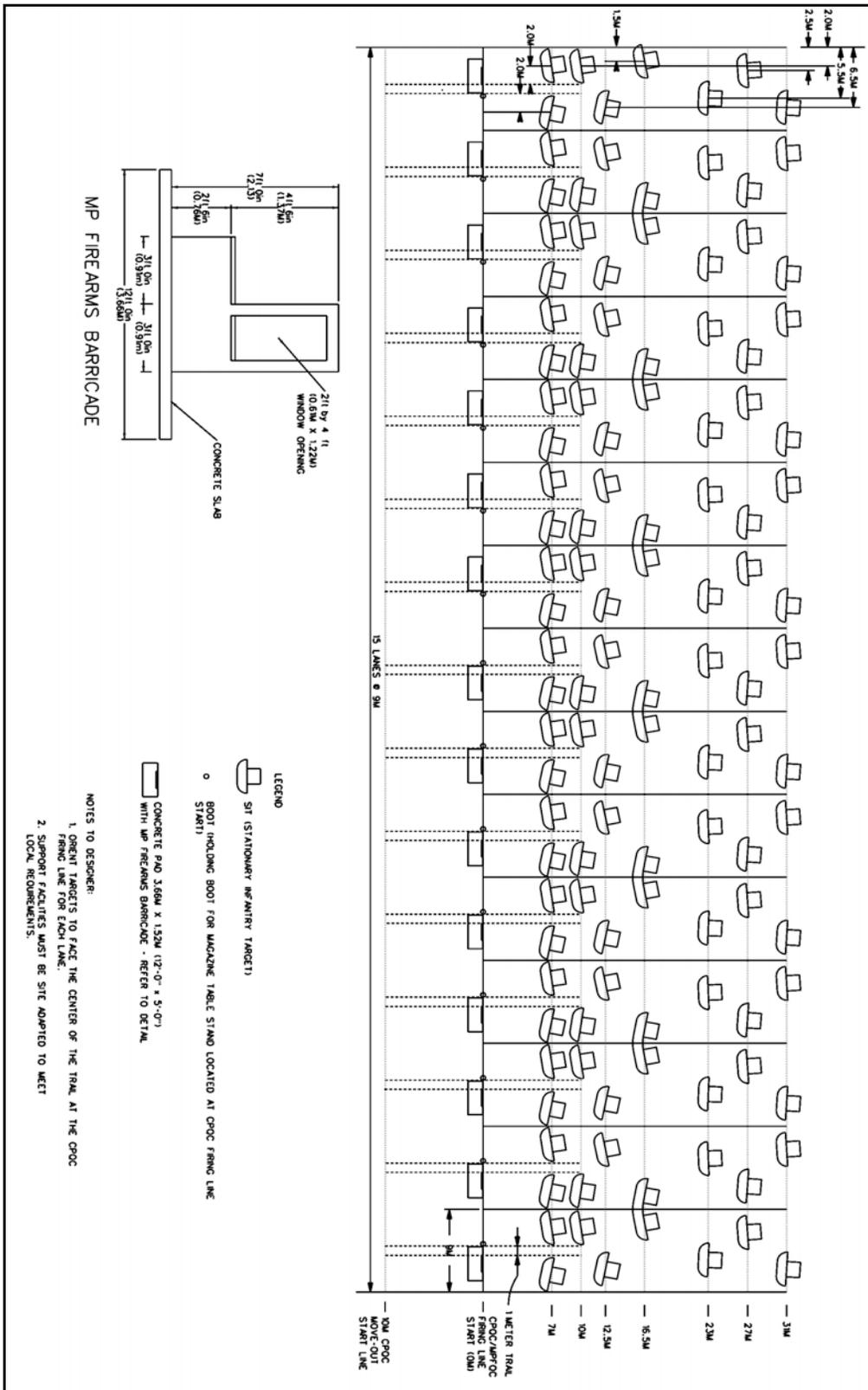


Figure D-9. CPQC/MPFQC

FCC 17829 Heavy Sniper Range

This range is used to train and test Soldiers on the skills necessary to detect, identify, engage, and defeat stationary infantry targets along with stationary and moving vehicular targets in a tactical array. This range satisfies the training and qualification requirements of the M107 long-range sniper rifle.

Primary features include—

- 3 stationary infantry targets.
- 14 stationary armor targets.
- 2 moving armor targets (200 meters).
- 10 iron maiden targets.
- 1 zero target.

All targets (excluding iron maidens) are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.10.

Additional information: Natural vegetation is required in the target area to provide realistic natural obstacles for the sniper to negotiate. A standard zero target is required at 500 meters.

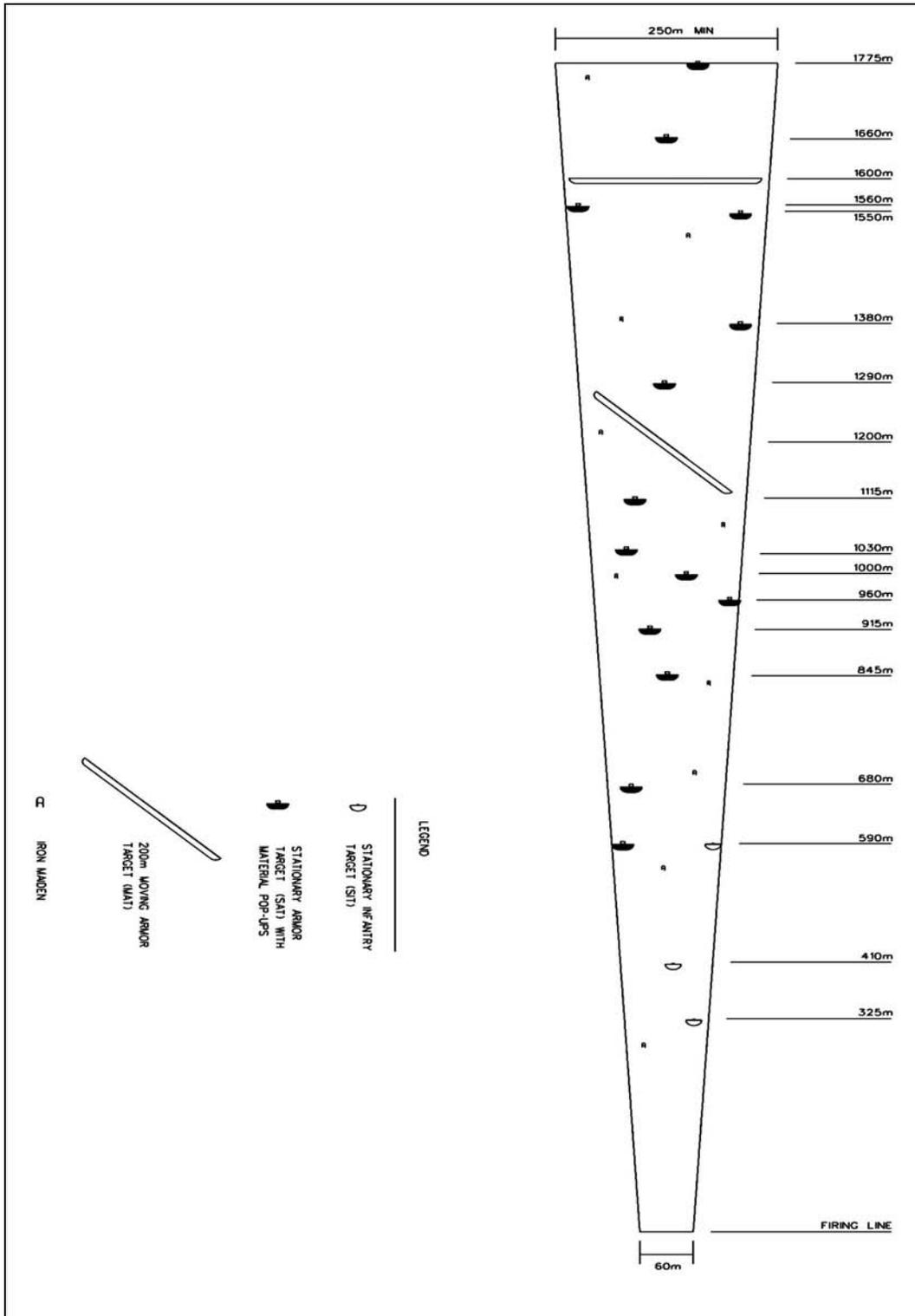


Figure D-10. Heavy sniper range

FCC 17833 MULTIPURPOSE MACHINE GUN RANGE (MPMG)

This range is used to train and test Soldiers on the skills necessary to zero, detect, identify, engage, and defeat stationary and moving infantry targets along with stationary armor targets in a tactical array using the M249 squad automatic weapon (SAW), M60 MG, M240B MG, MK19, M24 sniper weapon system, M110 semi-automatic sniper system and the M2 MG.

Primary features include—

- 98 stationary infantry targets.
- 24 double target arm – stationary infantry targets.
- 24 moving infantry targets emplacements.
- 20 stationary armor targets.
- 10 firing lanes.
- 10 Target boots.
- 20 iron maiden targets

Note: 26 stationary infantry emplacements are widened to support two target mechanisms.

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard SAROCA facilities

Requirement document: FM 3-22.27, FM 3-22.10, FM 3-22.65, FM 3-22.68

Additional information: Targets beyond 1,000 meters can be battery powered/radio controlled. All stationary/moving infantry target mechanisms are equipped with muzzle flash simulators. Target boots will be placed 10 meters from the baseline.

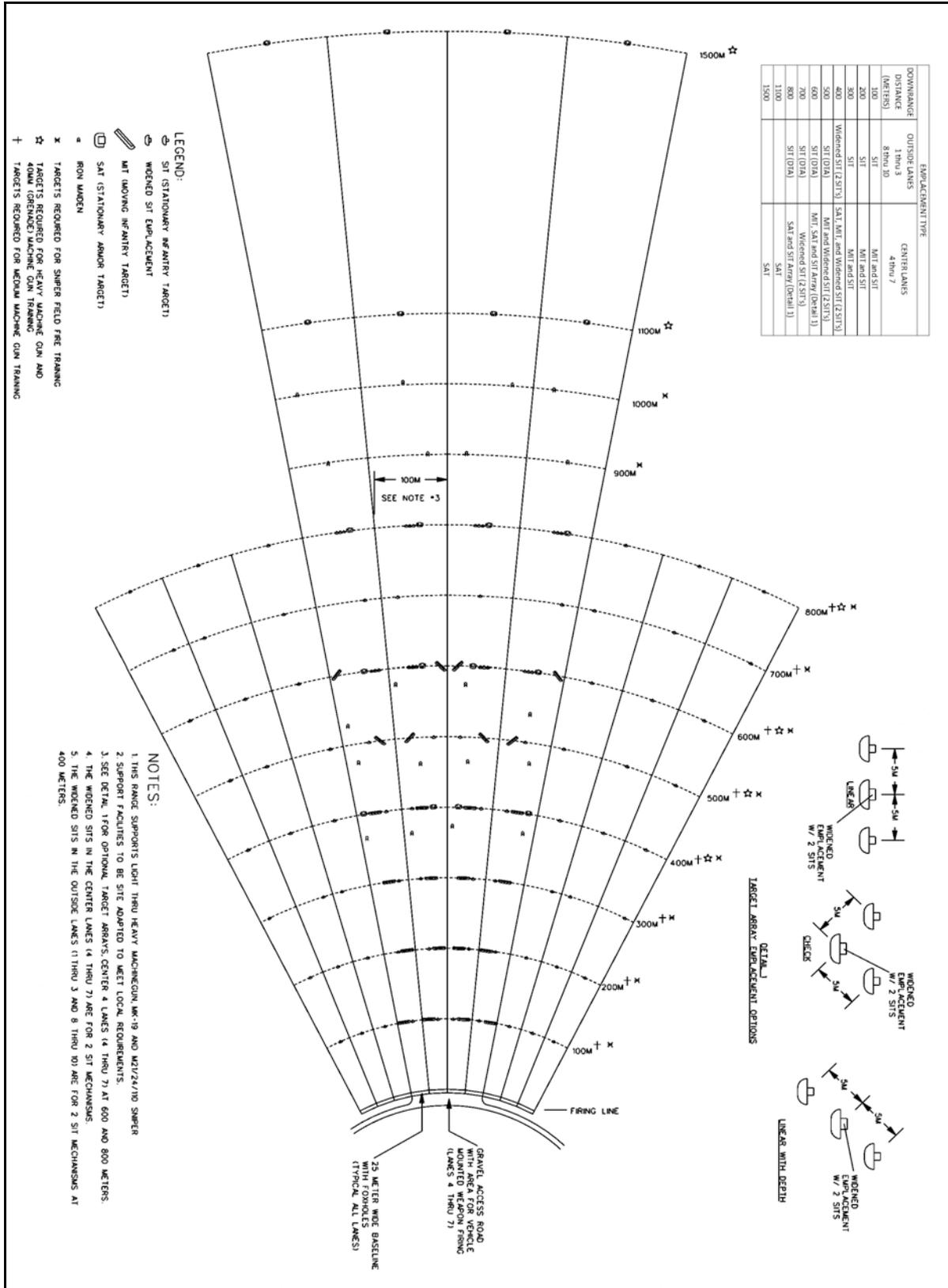


Figure D-11. Multipurpose machine gun range

FCC 17842 LAW/AT-4 RANGE

This complex is used to train and test Soldiers on the skills necessary to employ weapons, identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. The complex is designed to satisfy the training and qualification requirements of light anti-armor weapon systems. This range is fired using live rockets or subcaliber training devices.

Primary features include—

- 2 moving armor targets.
- 9 static stationary armor targets.
- 2 machine gun bunkers.

The moving targets are controlled from a small centrally located control building (shed).

Associated range operations and control facilities:

Latrine (73075)

Requirement document: FM 3-23.25

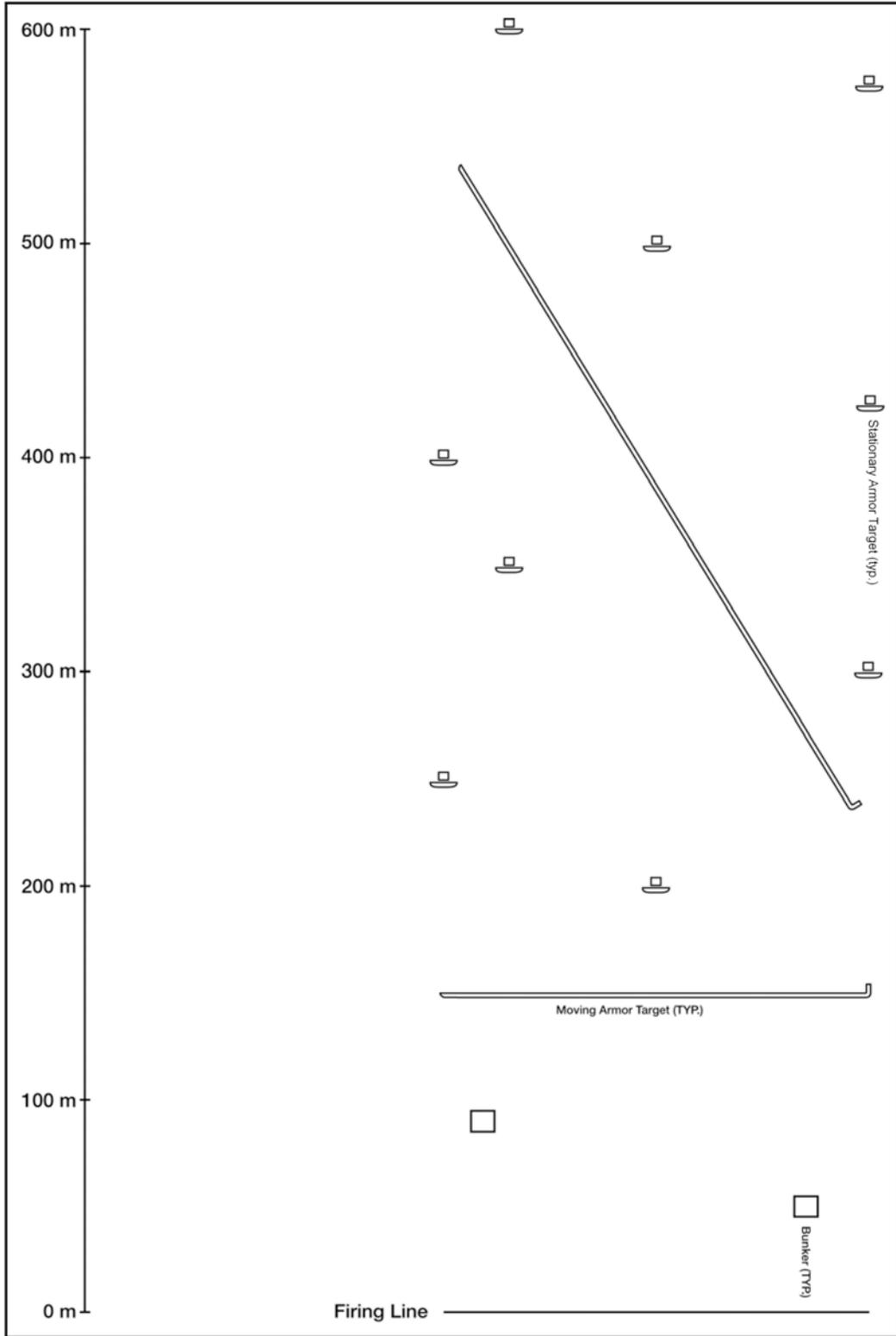


Figure D-12. LAW/AT-4 range

FCC 17845 ANTIARMOR TRACKING and LIVE FIRE

This complex is used to train and test Soldiers on the skills necessary to employ antiarmor weapon systems and to identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. The complex is designed to satisfy the training and qualification requirements of medium and heavy antiarmor weapon systems.

Primary features include—

- 5 moving armor targets.
- 12 stationary armor targets.
- 1 course road.

All targets are fully automated, computer-driven, and scored from the range operations center, tower. The range operating system is fully capable of providing immediate performance feedback to the using participants.

Associated range operations and control facilities:

Standard armor range operations and control area (AROCA) facilities

- Replace - Range operations center, large (17124), with—
 - Range operations center, tower (17971)
- Exclude - Small AAR building (17118)

Requirement document: FM 3-22.32, FM 3-22.34, FM 3-23.24

Additional information: Location of the boresight must be coordinated with the trainer.

Gunnery tasks requiring the usage of dud-producing ammunition cannot be fired on this range. Provisions for these tasks must be completed on ranges adjacent to duded impact areas.

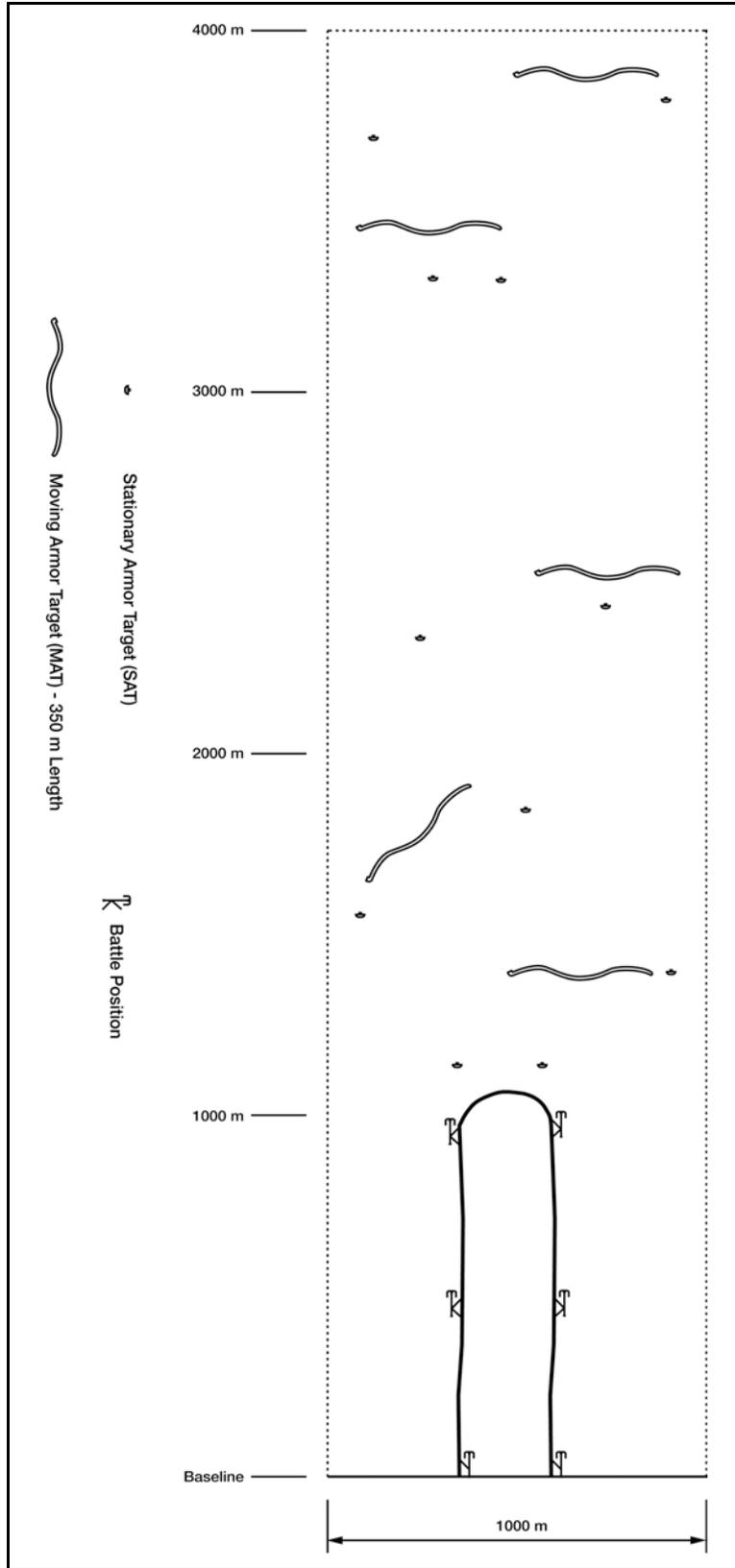


Figure D-13. Antiarmor tracking and live fire

FCC 17852 MORTAR RANGE

This range is used to train mortar crews on the skills necessary to apply fire mission data to engage and hit stationary targets in a tactical array.

Primary features include—

Surveyed firing point(s).

Dedicated impact area(s) with hard targets.

No automation is required for this facility.

Associated range operations and control facilities:

No standard facilities are associated with this range.

Requirement document: FM 7-90, FM 3-22.90, FM 3-22.91

Additional information: This range may be next to a unit maneuver area. It can then support maneuver training with tactical smoke and illumination. Approximately 10 surveyed firing points are needed on each division post to calibrate aiming circles.

Natural terrain and vegetation should remain undisturbed to the maximum extent possible.

Based on safety, forward observation areas are located in front of firing areas and slightly to the flank of primary mortar to target lanes.

A common impact area is used for all types of mortars. It is at least 2,000 meters wide and 6,000 meters deep. Firing at maximum and minimum range is obtained by using different firing points.

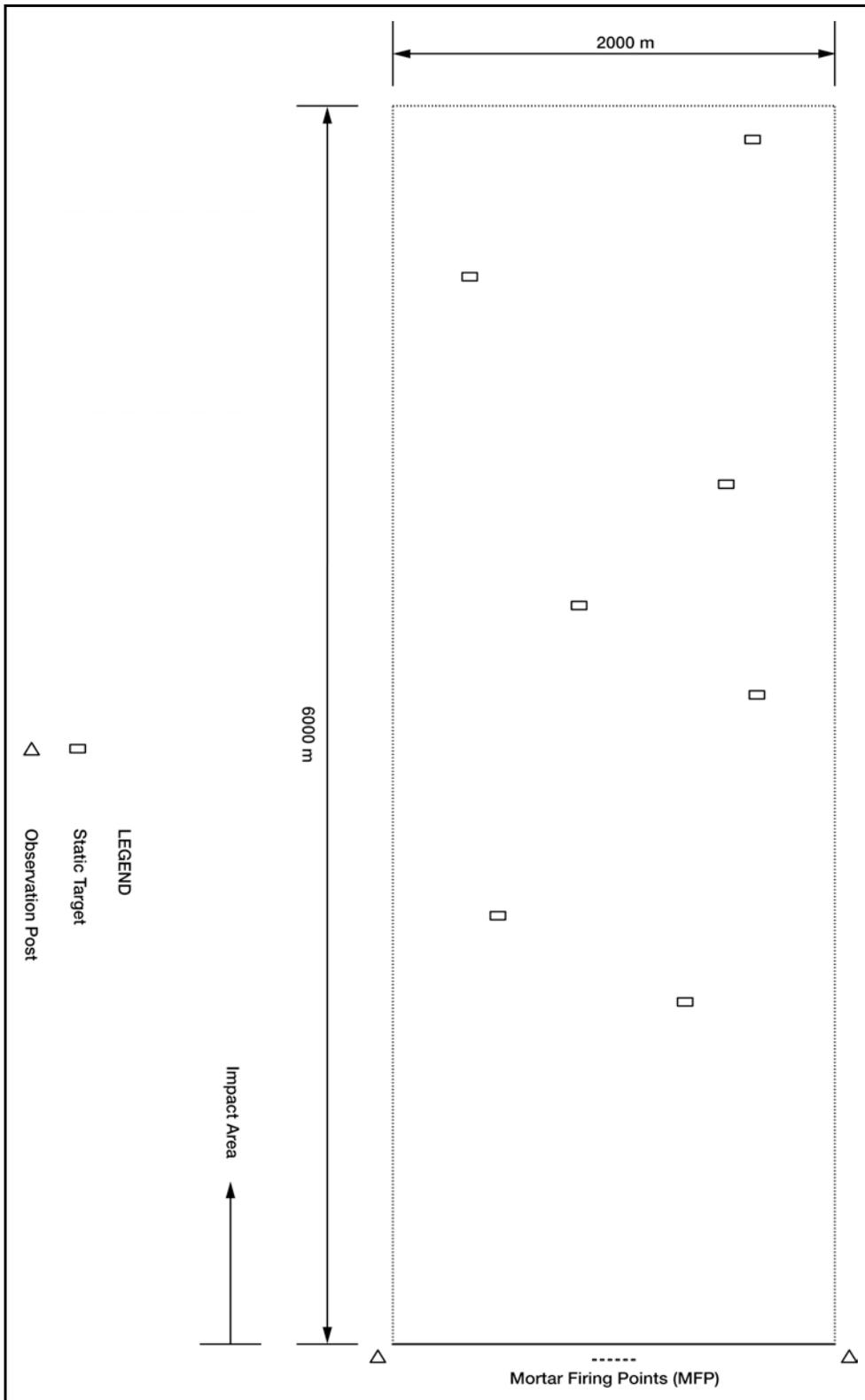


Figure D-14. Mortar range

FCC 17856 FIELD ARTILLERY INDIRECT RANGE

This range is used to train field artillery crews on the skills necessary to apply fire mission data to engage and hit stationary targets in a tactical array.

Primary features include—

Surveyed firing point(s).

Dedicated impact area(s) with hard targets.

No automation is required for this facility.

Associated range operations and control facilities:

No standard facilities are associated with this range.

Requirement document: FM 6-30, FM 6-40, FM 6-50, TC 25-1, FM 3-09.70

Additional Information: Ideally, this impact area is adjacent to direct fire ranges.

The alternate firing line should be located to fit the specific site.

Natural terrain and vegetation should remain undisturbed to the maximum extent possible.

The battery firing position depends on the size of the weapon and on the formation and terrain at the firing point.

Depending on the types of artillery planned, the following data should be used.

Type	Dimensions (meters)	
M119/M102 (105-mm) battery	Position	500 wide
	Range	1,500 deep
		7,500 wide
M109/M198 (155-mm) battery and M977 (203-mm) battery	Position	1,000 wide
	Range	25,000 wide
		12,500 wide
MLRS launcher (one weapon live fire)	Position	10 wide
	Range	15,000 wide
		30,000 deep
	Rear of launch blast	800 deep
		400 wide

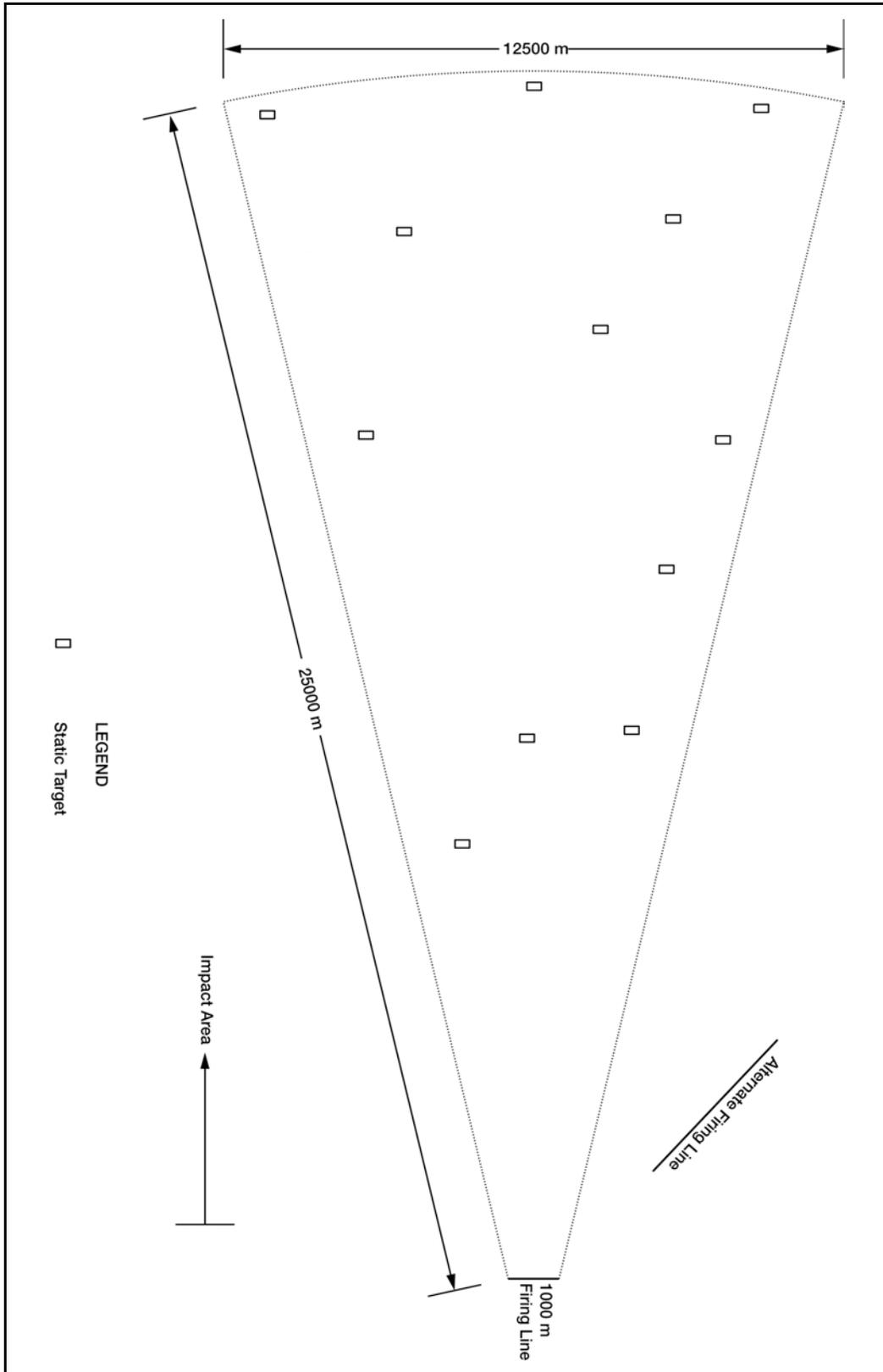


Figure D-15. Field artillery indirect range

FCC 17858 SCOUT/RECCE GUNNERY COMPLEX

This complex is used to train and test scout reconnaissance crews and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry and armor targets in a tactical array. In addition to the vehicle qualification course, there are four machinegun qualification lanes. These lanes are used to train and test soldiers on the skills necessary to zero, detect, identify, engage and defeat Stationary Infantry Targets (SIT's), Moving Infantry Targets (MIT's) and Stationary Armor Targets (SAT's) in a tactical array with machinegun weapons organic to a scout platoon or company/troop.

Primary features include—

- 35 stationary armor targets.
- 4 moving armor targets.
- 154 stationary infantry targets (12 clusters at 7 stationary infantry targets [SITs] each, 70 SITs for machine gun qualification).
- 8 moving infantry targets.
- 1 lane (2 course roads).
- 2 facades.
- 8 battle positions (one mortar simulation device/BES provided with every other battle position).

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. The range operations center, tower will have the capability to receive and send digital communications to the firing platforms.

Associated range operations and control facilities:

Standard AROCA facilities

Replace: Instrumented range operations center, Tower (1544sqft) with --

Range operations center, Tower (17971) with two floors.

Replace: Instrumented Range, After action review building (3024sqft) with—

After action review building, Small (17118).

Exclude: Vehicle instrumentation dock.

Requirement document:, FM 3-20.21, FM 3-22.27, FM 3-22.68, FM 3-22.65, FM 3-22.37, FM 3-22.32, FM 3-22.34.

Additional information: These ranges use thermal targets, muzzle flash simulators, and hostile-fire/target-kill simulators. A standard boresight line with target will be placed on the range footprint. Gunnery tasks requiring the usage of dud-producing ammunition cannot be fired on these ranges. Provisions for these tasks must be made in impact areas adjacent to the ranges.

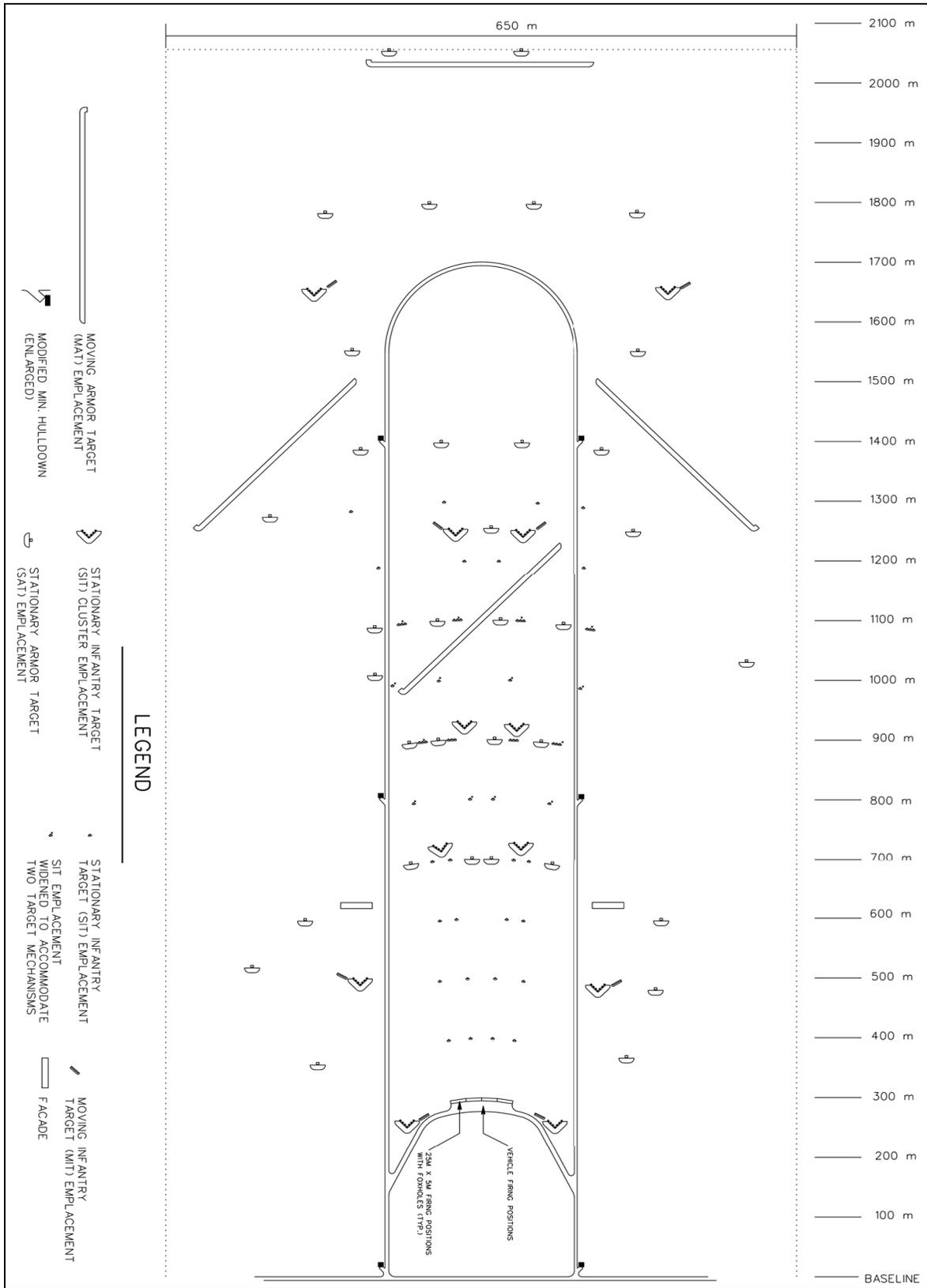


Figure D-16. Scout/Recce gunnery complex

**FCC 17859 DIGITAL MULTIPURPOSE TRAINING RANGE (DMPTR)/
FCC 17865 MULTIPURPOSE TRAINING RANGE**

Each range is used to train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry and armor targets in a tactical array. They are designed to satisfy the training and qualification requirements for the crews and sections of Armor, Infantry, Aviation, Stryker, unstabilized platforms and convoy live fire. They also support MGS (with addition of breach walls/windows) and dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with, supporting vehicles. In addition to live fire, they can also be used for training with subcaliber and/or laser training devices. A Convoy Live Fire route will be included with use of the crossover roads.

Primary features include—

- 30 stationary armor targets.
- 6 moving armor targets.
- 146 stationary infantry targets (14 clusters at 7 SITs each, 4 at 6 SITs each and 3 SITs per facade).
- 4 moving infantry targets (40 meters each with 6-man SIT cluster).
- 8 facades.
- 2 trenches with bunkers.
- 1 urban cluster (7 bldg).
- 1 lane (2 course roads) with midpoint crossover capability.
- 8 battle positions (one mortar simulation device/BES provided with every other battle position).
- 2 breach walls. (SBCT equipped installations – requires two additional SAT's)

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. Targets will receive and transmit digital data from the range operations center. The captured data is then compiled and available to the unit during the after action review.

Associated range operations and control facilities:

Standard AROCA facilities

Non-Instrumented versions:

Replace: Instrumented range operations center, Tower (1544sqft) with --
Range operations center, Tower (17971) with two floors.

Replace: Instrumented Range, After action review building (17123) with—
After action review building, Small (17123).

Exclude: Vehicle instrumentation dock

Requirement document: FM 3-20.21, FM 3-04.140, FM 3-22.3, TC 7-9.

Additional information: These ranges use thermal targets, muzzle flash simulators, and hostile-fire/target-kill simulators. A standard boresight line with target will be placed on the range footprint.

Gunnery tasks requiring the use of dud-producing ammunition cannot be fired on these ranges. Provisions for these tasks must be made in impact areas adjacent to the ranges. Hard targets may be positioned in the impact area to facilitate RF/IR signatures for aviation gunnery.

The DMPTR includes all the necessary instrumentation equipment to support recording of through-sight video, interior crew cameras, and target location and integrates it with all audio and digital communications for a complete after action review.

The range operations center on the MPTR must receive and send digital communications to the firing platforms. All other Instrumentation components are not included in the MPTR.

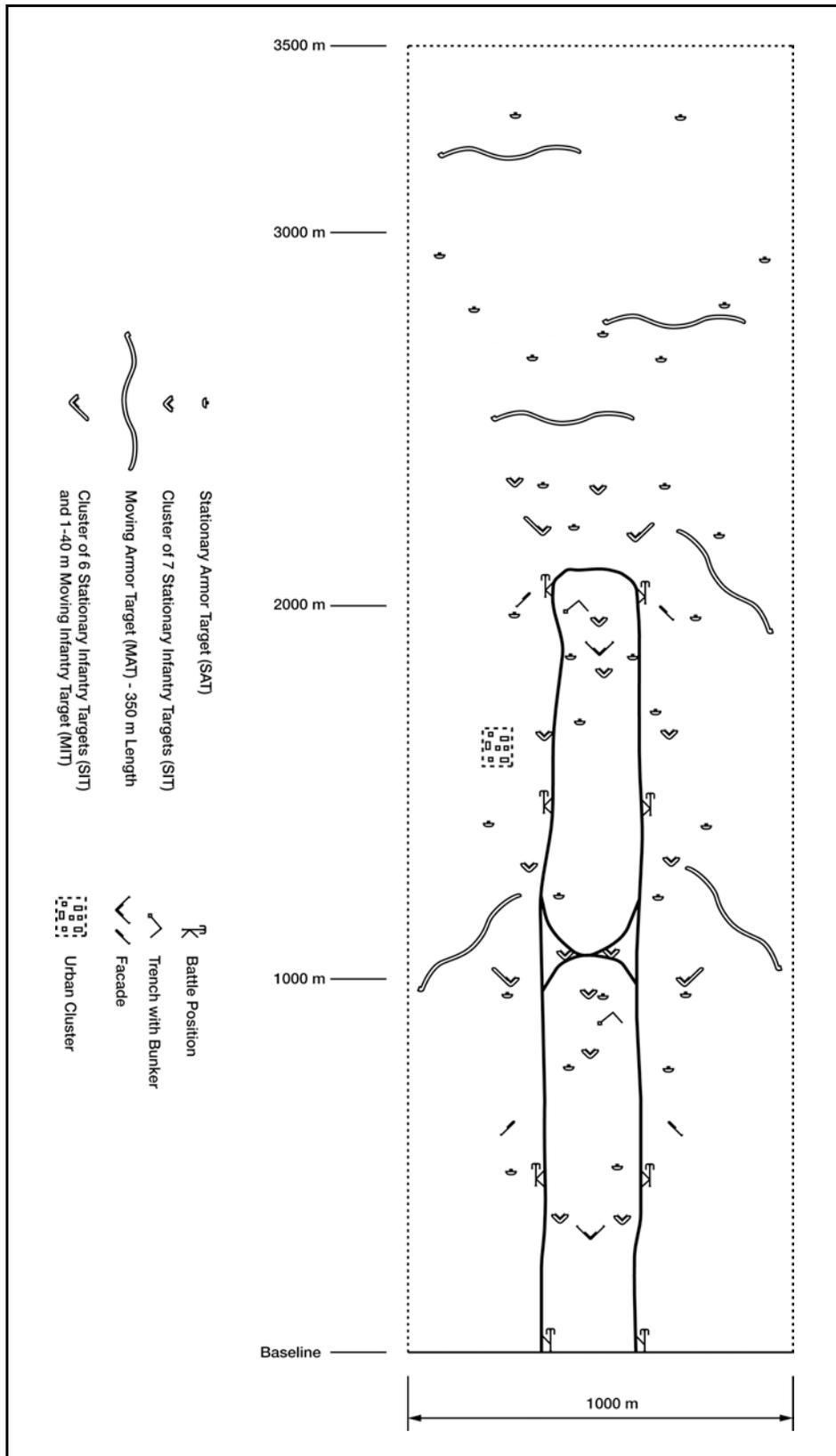


Figure D-17. DMPTR/MPTR

**FCC 17860 DIGITAL MULTIPURPOSE RANGE COMPLEX (DMPRC)/
FCC 17868 MULTIPURPOSE RANGE COMPLEX (MPRC)**

Each complex is used to train and test Armor, Infantry, Aviation, Stryker, unstabilized platforms and convoy live fire crews, sections, squads, and platoons on skills necessary to detect, identify, engage, and defeat stationary and moving infantry and armor targets in a tactical array. They also support MGS (with addition of breach walls/windows) and dismounted infantry squad/platoon tactical live-fire operations either independently of, or simultaneously with, supporting vehicles. Company combined arms live-fire exercises (CALFEX) may also be conducted on this facility. This complex also accommodates training with subcaliber and/or laser training devices. A Convoy Live Fire route will be included with use of the crossover roads.

Primary features include—

Threshold area – 2.5 x 5 kilometers. (Meets minimum training standards.)

80 stationary armor targets.

12 moving armor targets.

306 stationary infantry targets (45 clusters at 6 SITs each and 3 SITs per facade).

45 moving infantry targets (one per SIT cluster).

(38 at 15 meters and 7 at 40 meters).

12 facades.

4 trenches with bunkers.

2 urban clusters (5 and 7 bldg).

2 breaching obstacles.

4 breach walls. (SBCT equipped installations – requires four additional SAT's)

3 lanes (6 course roads) with midpoint crossover capability.

30 defilade battle positions (one mortar simulation device/BES provided with every other battle position).

4 breach walls with windows. (SBCT equipped installations require eight additional SAT's)

Objective area – (Allowed if range depth extends beyond 5 kilometers).

10 stationary armor targets.

3 moving armor targets.

6 defilade battle positions (one mortar simulation device/BES provided with every other battle position).

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. Targets will receive and transmit digital data from the range operations center. The captured data is then compiled and available to the unit during the after action review.

Associated range operations and control facilities:

Standard AROCA facilities

Non- Instrumented version:

Replace: Instrumented range operations center, Tower (1544sqft) with --

Range operations center, tower (17971) with two floors

Replace: Instrumented Range, After action review building (17123) with—

After action review building, large (17123)

Exclude: Vehicle instrumentation dock

Requirement document: FM 3-20.21, FM 3-04.140, FM 3-22.3, TC 7-9, ARTEP 7-20-MTP, ARTEP 71-2-MTP.

Additional information: These ranges use thermal targets, muzzle flash simulators, and hostile-fire/target-kill simulators. A standard boresight line with target will be placed on the range footprint.

Gunnery tasks requiring the use of dud-producing ammunition cannot be fired on these ranges. Provisions for these tasks must be made in impact areas adjacent to the ranges. Hard targets may be positioned in the impact area to facilitate RF/IR signatures for aviation gunnery.

The DMPRC includes all the necessary instrumentation equipment to support recording of through-sight video, interior crew cameras, target location, which integrates with all audio and digital communications for a complete after action review.

The range operations center on the MPRC must have the capability to receive and send digital communications to the firing platforms. All other instrumentation components are not included in the MPRC.

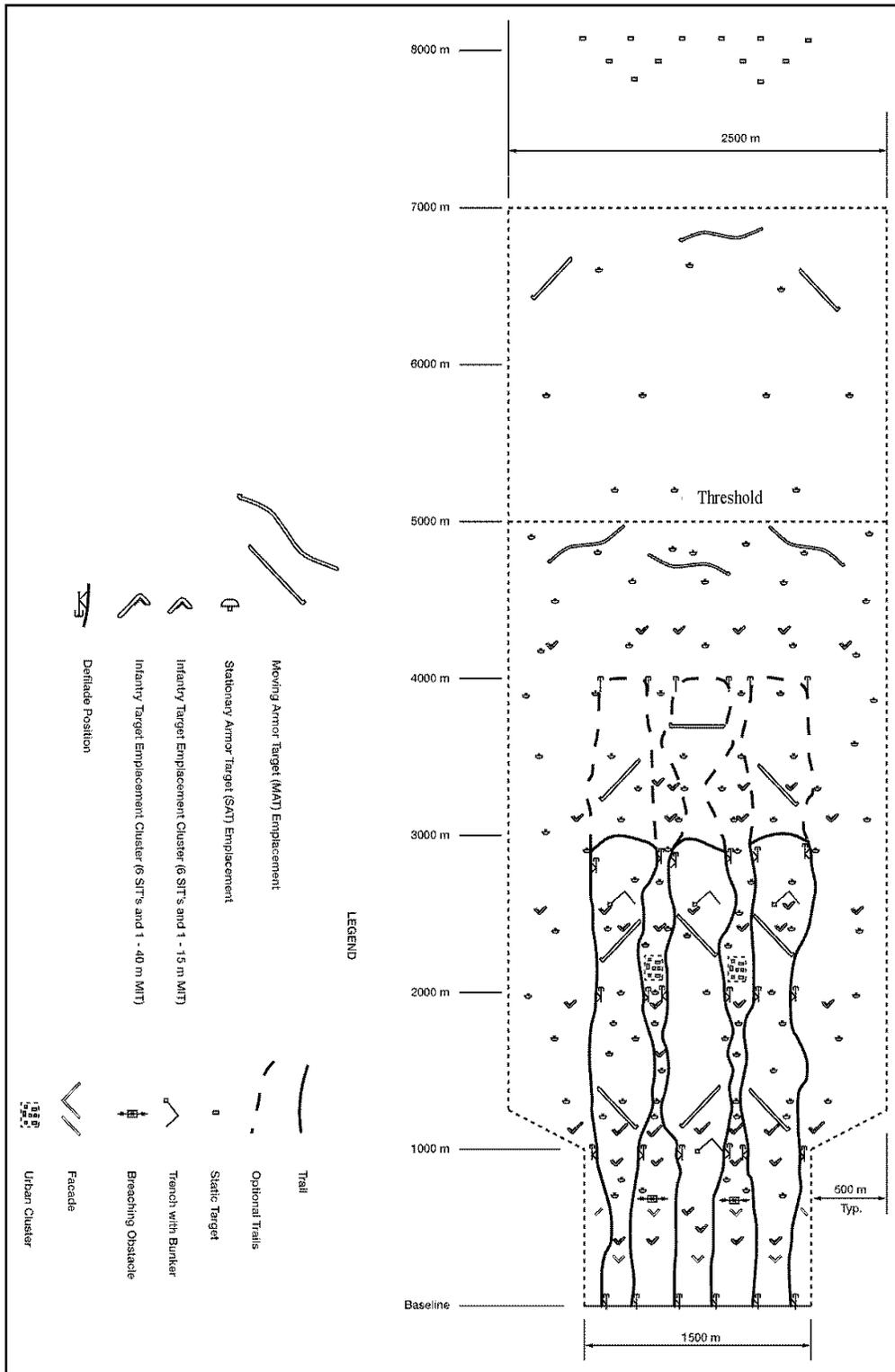


Figure D-18. DMPRC/MPRC

FCC 17721 DIGITAL AIR/GROUND INTEGRATION RANGE (DAGIR)

This complex is used to train and test Aviation crews, teams, platoons, companies/troops along with Armor, Infantry, Stryker, unstabilized platforms and convoy live fire crews, sections, squads, and platoons on skills necessary to detect, identify, and effectively engage stationary and moving infantry and/or armor targets in a tactical array. It also supports MGS (with addition of breach walls/windows) and dismounted infantry squad/platoon tactical live-fire operations either independently of, or simultaneously with, supporting vehicles. Company combined arms live fire exercises (CALFEX) and fully integrated advanced tables may also be conducted on this facility. This complex also accommodates training with subcaliber and/or laser training devices. MOUT and convoy live-fire facilities are required to enable diving engagement to specified streets/intersections and engagements in close proximity on adjacent terrain. Additionally, the DAGIR will enable critical air-ground integration tactics, techniques, and procedures (TTP) training to ensure the optimum teaming of ground and air, Army, and joint platforms. Primary features include threshold and objective areas A and B. Aviation FARP, tower, aerial firing positions, and aircraft holding area are also required. Construction of these facilities will be targeted to installations that will support medium or heavy combat aviation brigades (CABs). Installations with light CABs or smaller units should ensure aviation requirements are addressed in existing or programmed facilities (DMPRC, DMPTR and BAX). A Convoy Live Fire route is included with the use of the crossover roads.

Primary features include—

Threshold - footprint is 4 x 6 kilometers. (Meets minimum standards of aviation unit tables' I-XII and CALFEX). Includes: 1 x 4 kilometer ground platform free maneuver area (extends into objective area A if available).

50 stationary armor targets.

8 moving armor targets.

246 stationary infantry targets (35 clusters with 6 SITs, 3 SITs per facade).

35 moving infantry targets (one per SIT cluster) (28 at 15 meters and 7 at 40 meters).

12 facades.

4 trenches with bunkers.

2 breaching obstacles.

4 breach walls. (SBCT equipped installations – requires four additional SAT's)

4 stationary 3D diving fire targets. (may be located in objective areas if available).

2 lanes (4 course roads).

1 convoy live fire lane (extends into objective area A if available).

20 battle positions (12 defilade, 8 hasty; one MSD/BES provided with every other BP).

12 aerial firing positions (some may be placed in objective areas A and B if available).

1 Air/Ground Integration Village

- 13 structures – a standardized mixture of one/two/three story modular construction, (non-live fire within the village) which are surrounded by:

- 14 modular structures optimally configured to leverage existing targetry to enable live fire engagement of nearby/interspersed targets by Aviation assets.

Objective Area A – 1 kilometer lateral extension on both sides of threshold, and a 3 kilometer extension in depth. (Allows greater dispersion of targets and separation of firing vehicles to maximize capabilities of digital platforms during advanced tables IX, X).

15 stationary armor targets.

2 moving armor targets.

60 stationary infantry targets (10 clusters with 6 SITs each).

10 moving infantry targets (one per SIT cluster).

1 urban cluster (5 - 7 buildings; live fire within the facility by aviation assets). May be placed in area A if area B is not available due to terrain limitations.

Objective Area B – 1 kilometer lateral extension on both sides of objective area A, and a 3 kilometer extension in depth. The width and depth of the range provides greater aviation capabilities during advanced tables XI, XII and CALFEX (to include, firing from both sides of the aircraft for door gunnery).

5 stationary armor targets.

2 moving armor targets.

Static targets (to support indirect fire/close air support [CAS] engagements).

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. Targets will receive and transmit digital data from the range operations center. The captured data is then compiled and available to the unit during the after action review. Target emplacement must enable protection and resilience from training munitions fired from diving-fire angles of 15 to 30 degrees as provided in FM 3-04.140 and aircrew training manuals.

Standard aviation range operations and control area (AVROCA) facilities:

Instrumentation requirements: The DAGIR must exchange information with command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems to simulate the full range of battlefield systems and stimulate C4ISR systems. The DAGIR instrumentation system will interface with maneuver control system – Lite (MCS)-Lite, Blue Force Tracker, FBCB2, and Aviation Mission Planning System (AMPS). DAGIR player unit capable of force on target (T) and force on force (O).

Required Document: FM 3-04.140, FM 3-04.111, FM 3-20.21, FM 3-22.3, ARTEP 1-111, ARTEP 1-113, ARTEP 1-118, ARTEP 1-126, ARTEP 7-20-MTP, ARTEP 71-2

Additional Information: This complex uses thermal targets, muzzle flash simulators, and hostile-fire/target-kill simulators. Location of the boresight target and weapon harmonization target must be coordinated with the trainer.

Gunnery tasks requiring the use of dud-producing ammunition cannot be fired on the complex. Provisions for these tasks must be made in impact areas adjacent to the complex or specified areas in objective areas of the complex (if these areas overlap existing permanently duded terrain).

The DAGIR range operations center must have the capability to receive and send digital communications to the firing platforms. All stationary/moving infantry targets will be equipped with a muzzle flash simulator.

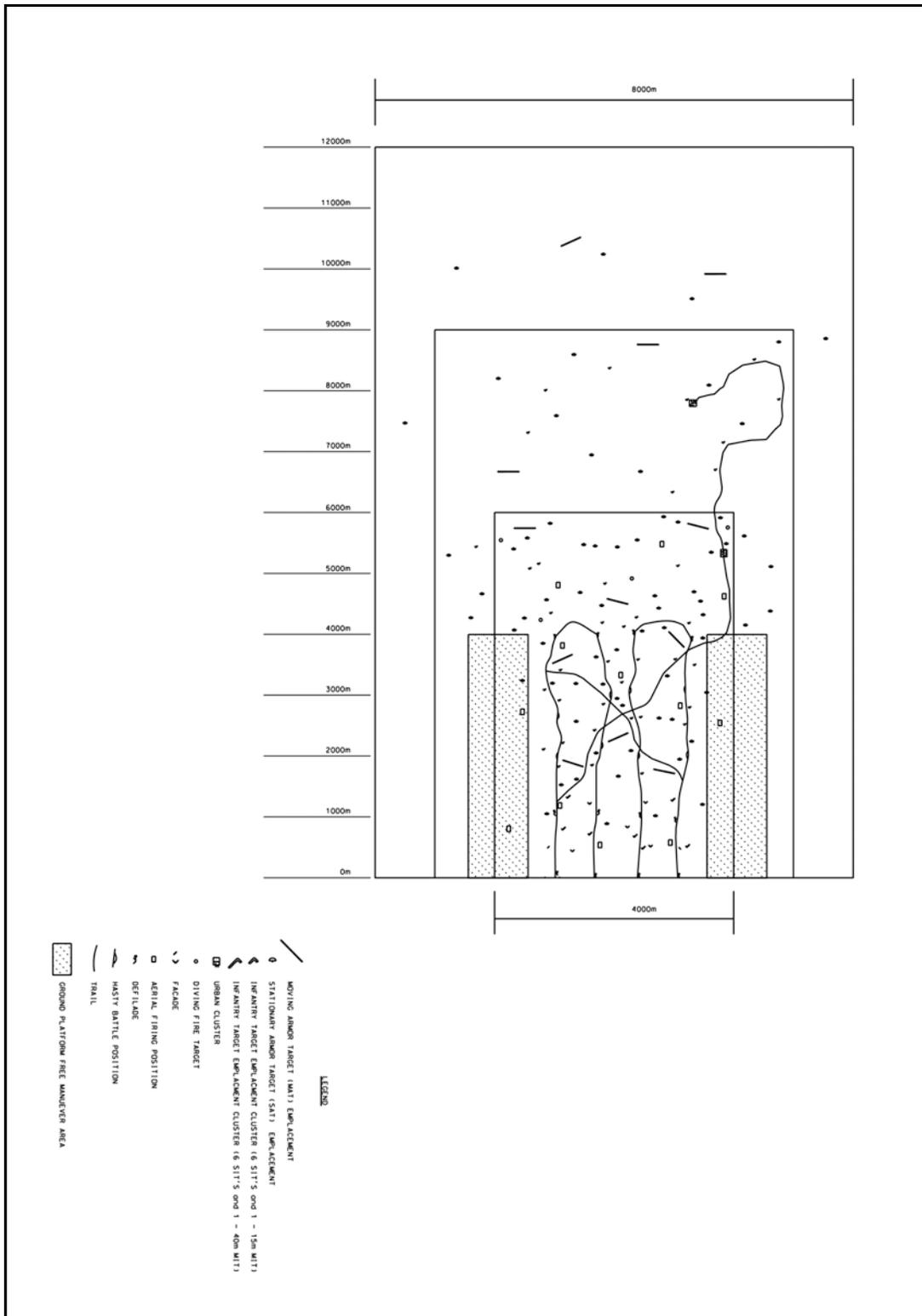


Figure D-19. DAGIR