
Training Ranges

DISTRIBUTION RESTRICTION: Distribution authorized to the DOD and DOD contractors only to protect technical or operational information from automatic dissemination under the International Exchange Program or by other means. This decision was made on 07 NOV 2007. Other requests for this document will be referred to: Commander, US Army Training Support Center (ATSC), ATTN: Director, ATIC-TCM-L, Fort Eustis, VA 23604.

DESTRUCTION NOTICE: Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

Headquarters, Department of the Army

FCC 17862 TANK/FIGHTING VEHICLE SCALED GUNNERY RANGE (1:5 and 1:10)

This range is used to train and test armor, infantry and mounted unstabilized weapons crews on the skills necessary to detect, identify, decide, engage, and assess stationary and moving scaled targets in a tactical array using sub caliber training devices and/or simulations. It is specifically designed to satisfy the training and qualification requirements for the crews of armor and infantry units.

Primary features include—

- 19 stationary infantry targets.
- 8 moving infantry targets.
- 1 facade (with 3 SITs – included in total SITs).
- 1 lane (2 course roads).
- 4 battle positions.

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring.

Associated range operations and control facilities:

- Standard SAROCA facilities
- Exclude: Bleacher enclosure (75061)
- Classroom Facility (17123)
- Ammo Breakdown (17122)

Requirement document: FM 3-20.21, FM 3-22.3

Additional information: This range uses thermal targets and muzzle flash simulators.

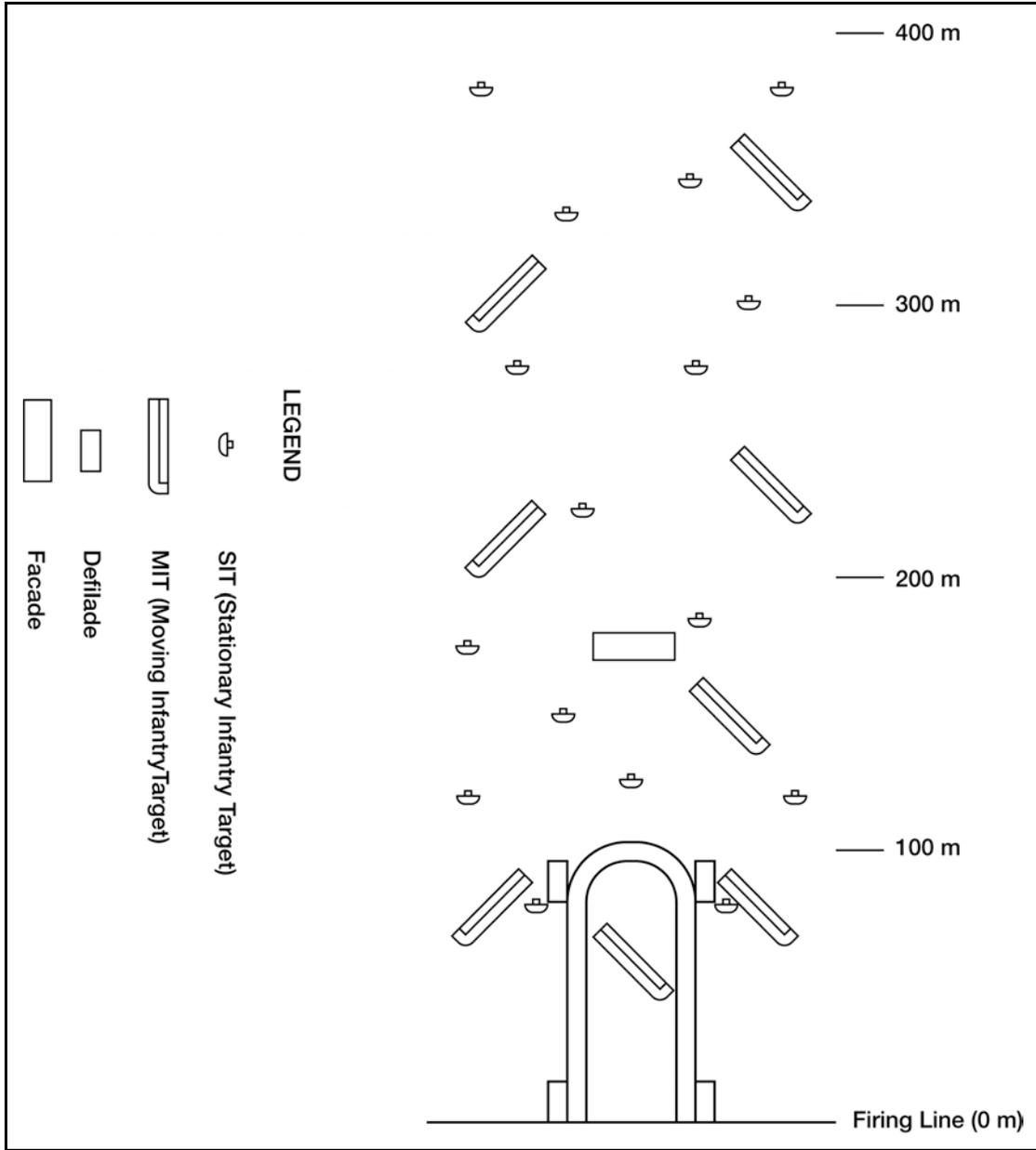


Figure D-20. Tank/vehicle scaled gunnery range (1:5 and 1:10)

FCC 17863 TANK/FIGHTING VEHICLE STATIONARY GUNNERY RANGE

This complex is used to train and test armor, infantry and mounted unstabilized weapons crews on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry and armor targets in a tactical array. In addition to live fire, it can also be used for training with subcaliber and/or laser training devices.

Primary features include—

- 25 stationary armor targets.
- 4 moving armor targets.
- 42 stationary infantry targets (7 clusters at 6 SITs each).
- 7 moving infantry targets (15 meters each with 6-man SIT cluster).
- 1 lane.

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. Targets will receive and transmit data from the range operations center tower. 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
- Replace: Range operations center, Tower large (17971) with—
Range operations center, tower (17971)
- Replace: Instrumented Range, After action review building (17123) with—
Classroom Facility (17123)
- Exclude: Vehicle Instrumentation Dock
- Exclude: Bivouac area

Requirement document: FM 3-20.21, FM 3-22.3

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

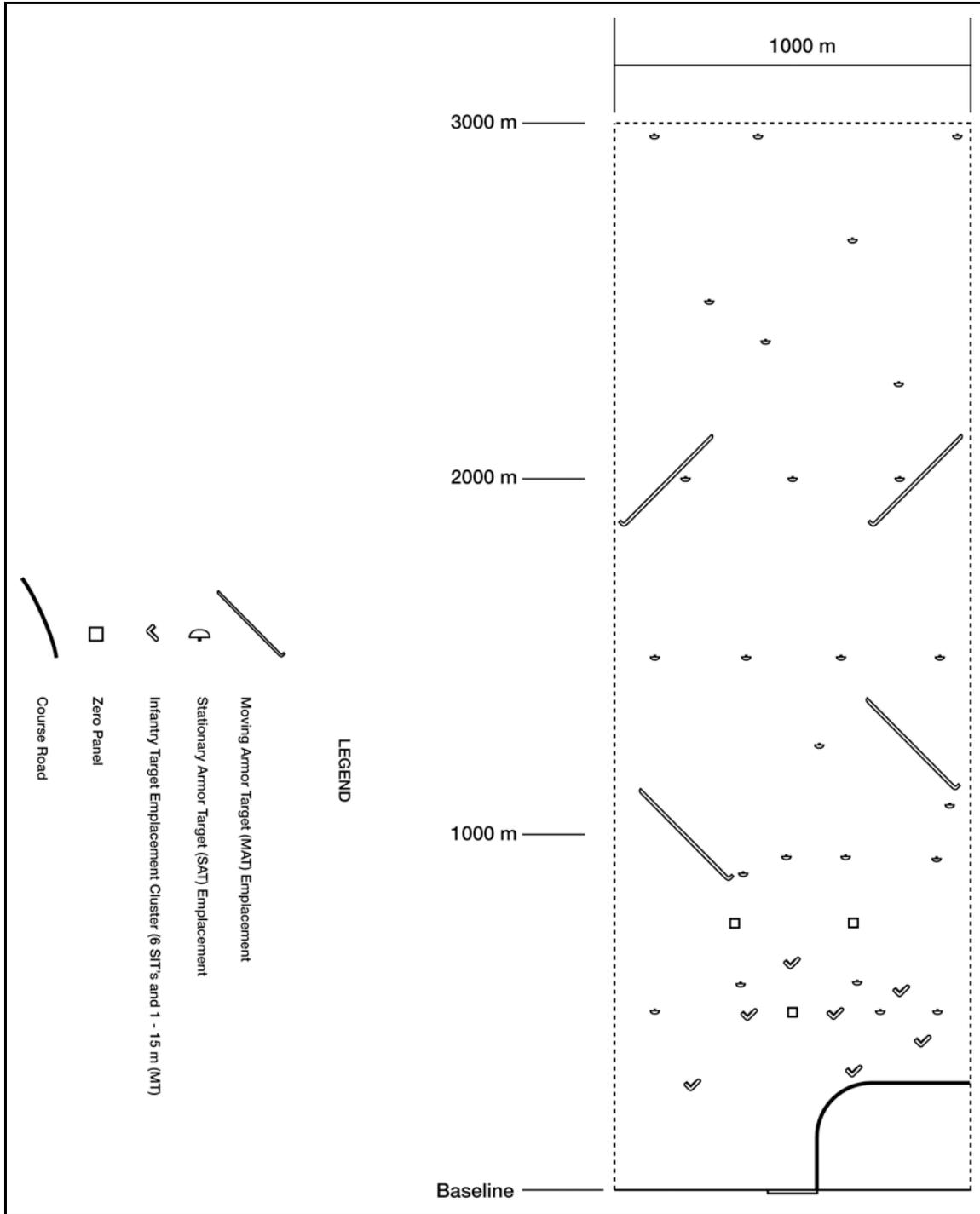


Figure D-21. Tank/vehicle stationary gunnery range

FCC 17870 BATTLE AREA COMPLEX (BAX)

This complex is used to train and test the Stryker brigade combat team (SBCT) and infantry brigade combat team (IBCT) crews, sections, platoons, companies, 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 in both open and urban terrain environments. This complex also supports tactical live-fire operations independently of, or simultaneously with, supporting vehicles in free maneuver. Company CALFEX may also be conducted on this facility. This complex accommodates training with subcaliber and/or training devices. A Convoy Live Fire route will be included with use of qualification/tactical trails.

Primary features include—

- 43 stationary armor targets.
- 222 SITs (25 clusters at 7 SITs each, 35 single and 3 per facade).
- 6 moving armor targets.
- 14 moving infantry targets.
- 4 facades with breach walls.
- 2 trench lines with machine-gun bunkers.
- 4 breaching obstacles.
- 2 lanes (2 course roads in 1 lane, no course roads in the free maneuver lane).
- 8 hasty battle positions (one mortar simulation device/BES provided near every other battle position)
- 3 landing zones (locations not shown).
- 2 urban clusters (5 and 7 building).

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
- Add: ammunition breakdown building (17129)

Requirement document: FM 3-20.21, FM 3-22.3, FM 3-21.9, FM 3-21.11

Additional information: This range uses thermal targets, muzzle flash simulators, and hostile-fire/target-kill simulators. It 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 must have the capability to receive and send digital communications to the firing platforms. A boresight line with target will be placed on the range footprint.

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 complex.

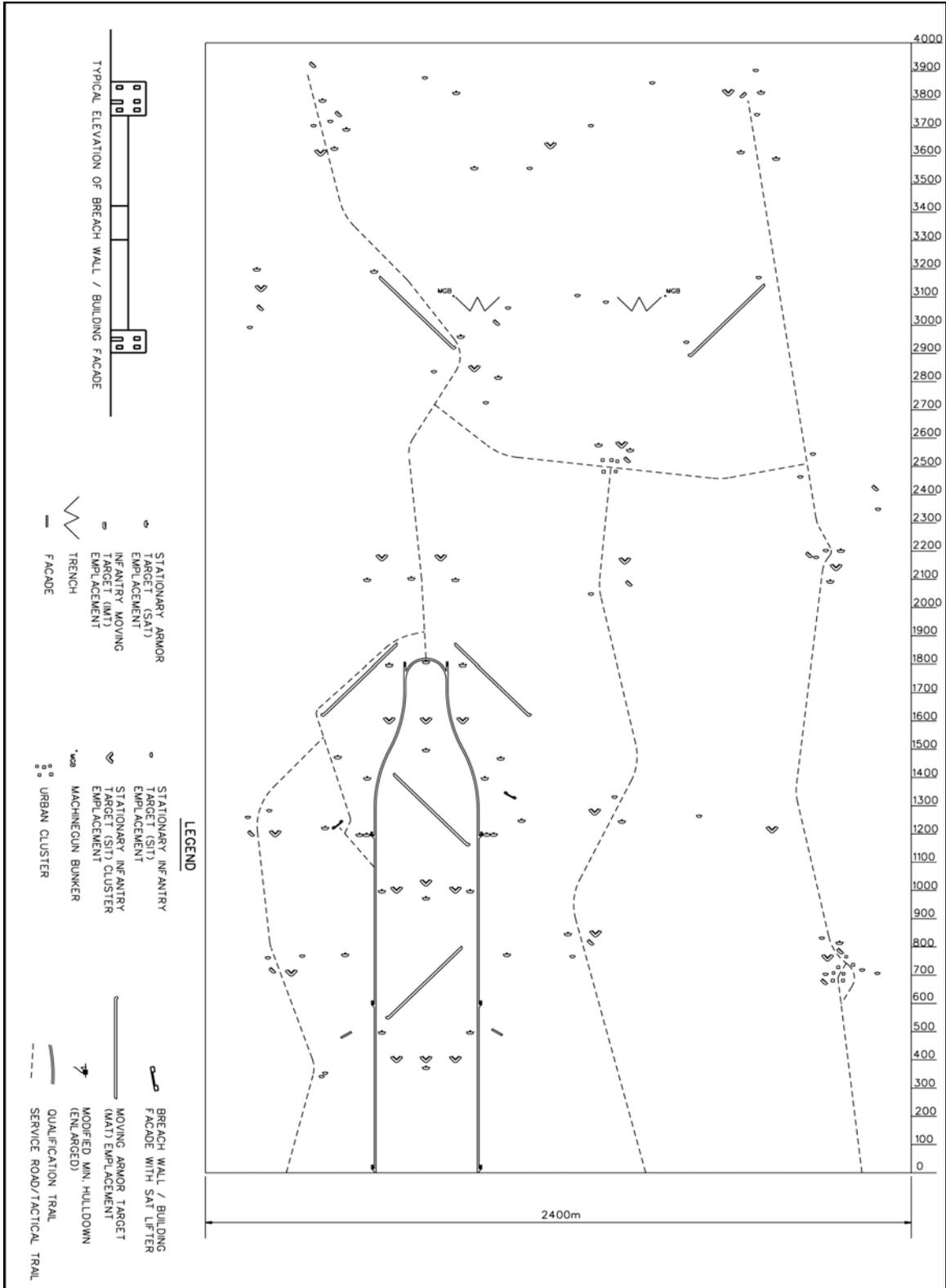


Figure D-22. Battle area complex

FCC 17872 AIR DEFENSE FIRING RANGE

This complex is used to train and test air defense artillery crews on the skills necessary to employ ground to air antiaircraft missiles against Ballistic Aerial Target Systems (BATS) and drones. This complex supports shoulder-launched as well as vehicle-launched missiles.

Primary features include—

4 shoulder/vehicle launch firing positions.

No automation is required for this facility.

Associated range operations and control facilities:

Range operations center, tower (17971)

Bleacher enclosure (75061)

Operations/storage building (17120)

Latrine (73075)

Requirement document: FM 3-01.11, FM 44-43, FM 44-44, FM 44-18-1

Additional information: For ground firing, large red arrows covered with highly visible paint are placed on right and left outer limits of the ricochet area. Red flags are placed on the firing line at start-fire and cease-fire points.

Stinger missiles have a 15 degree cone-shaped danger zone centered directly to the rear of the launcher. To avoid hazards, the ground directly to the rear of the gunner is cleared of all obstacles, and the launcher breech is placed one meter off the ground.

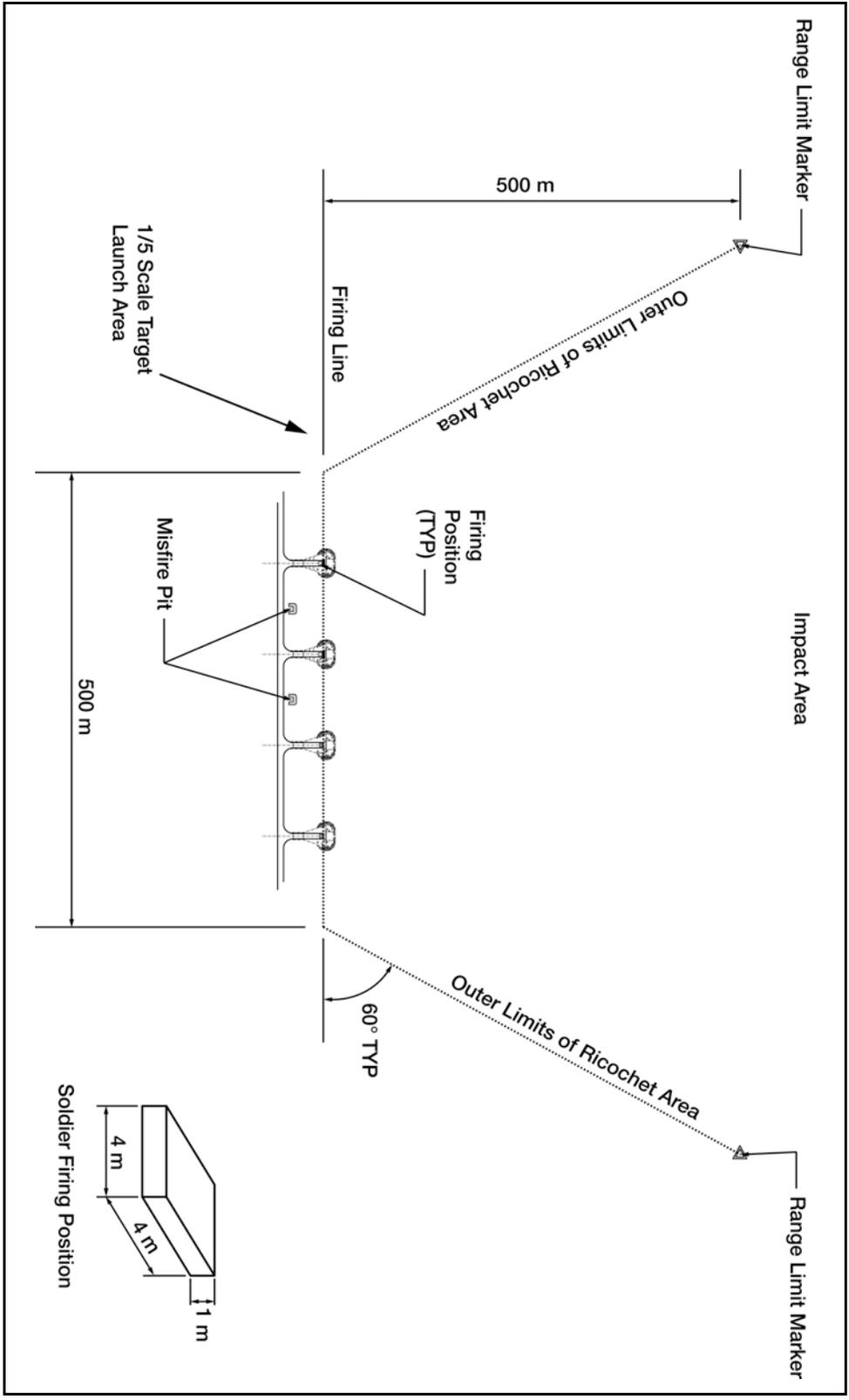


Figure D-23. Air defense firing range

FCC 17878 URBAN ASSAULT COURSE

This facility is used to train individual Soldiers, squads, and platoons on tasks necessary to operate within a built-up/urban area.

Primary features include—

Station 1: Individual and Team Trainer. This station is a three-room trainer where team leaders and squad leaders train the basics of building and room clearing.

Station 2: Squad and Platoon Trainer. This station is a four-structure trainer with multiple rooms. Squads build upon tasks learned at Station 1 and begin to learn the concepts of clearing multiple buildings. The station is designed in such a way that it can be used as individual buildings with a narrow street or as rooms inside a building with a long connecting hallway.

Station 3: Grenadier Gunnery Trainer. This station is a live-fire station where M203 gunners master target engagements in an urban area, move tactically, and respond to the fire commands.

Station 4: Offense/Defense House. This station is where a platoon can train to attack and/or defend a building. This station can also be divided into a number of smaller training stations to reinforce training or to train tasks not yet trained at the other stations.

Station 5: Underground Trainer. This station provides training for subterranean operations.

Targetry Requirements:

Station 1 - 6 human urban targets (HUTs).

Station 2 - 10 HUTs.

Station 3 - 10 SITs.

Station 4 - 10 HUTs.

Station 5 - No instrumentation required.

Targetry in stations 1, 2 and 4 are precision interior targets that need to be manually reset, reconfigured, and scored after each use. Station 3 targets are fully automated, and the event-specific target scenario is computer-driven and scored from a small shed at the baseline of the station.

Associated range operations and control facilities:

Operations/storage building (17122)

Latrine (73075)

Ammunition breakdown building (17129)

Requirement document: FM 3-06, TC 90-1, FM 3-06.11, FM 3-22.31

Additional information:

Station 1, 2, 4 & 5 - Not intended for live fire training.

Station 3 - Live fire - 40 millimeter HE grenades will not be used.

Station 5 - Smoke/pyrotechnics will not be employed inside the underground trainer.

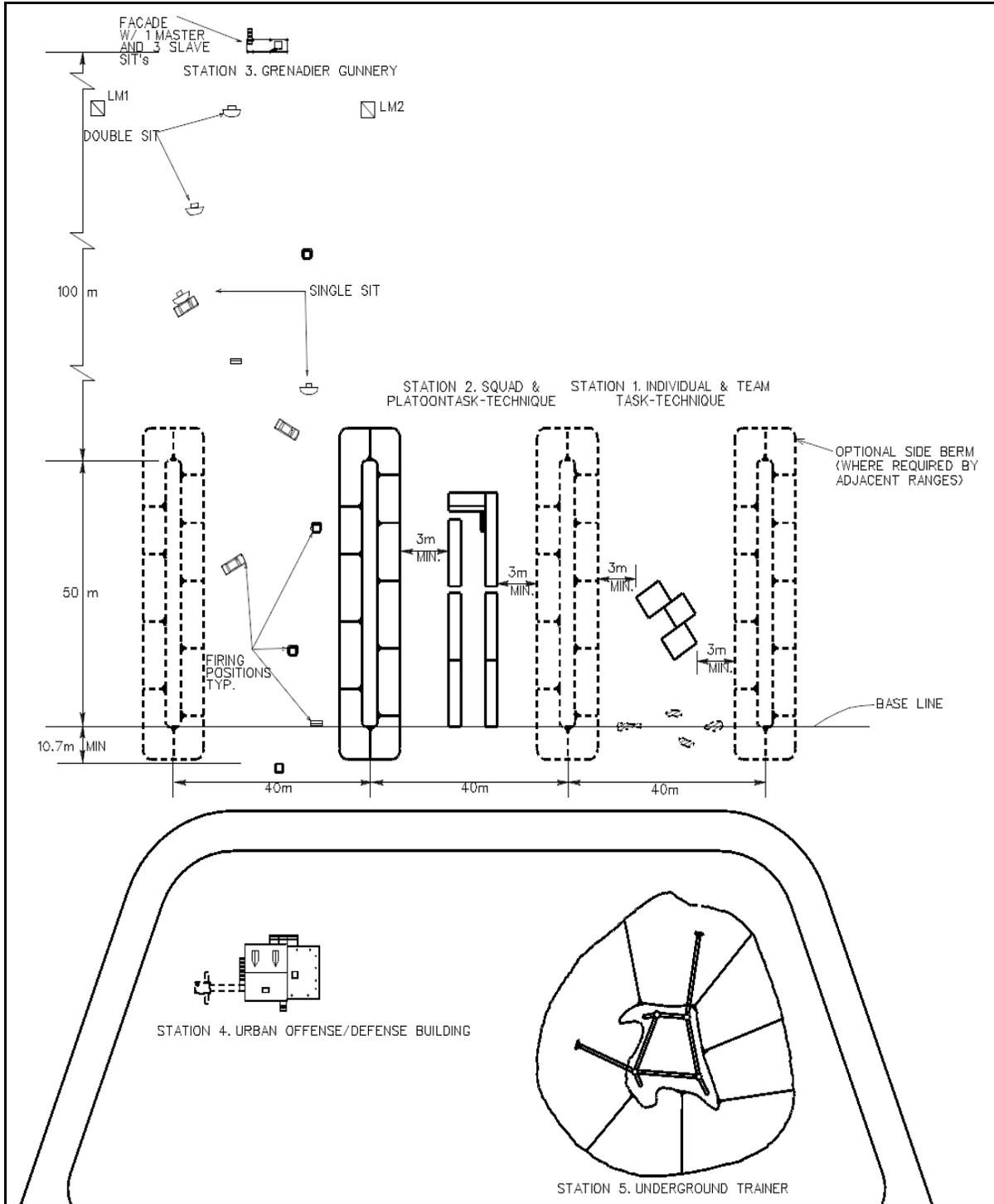


Figure D-24. Urban assault course

FCC 17879 LIVE-FIRE EXERCISE SHOOTHOUSE

The shoothouse provides units with a facility to train and evaluate individual Soldiers and squads on tasks necessary to move tactically (enter and clear a room; enter and clear a building), engage targets, conduct breaches, and practice target discrimination in a live-fire environment.

Primary features include—

Facility is divided into 8 separate rooms with 2 corridors for a minimal net training capability of 1,400 square feet.

- 20 target/camera outlets.

- 10 precision human urban targets (HUTs).

All targets are fully automated and the event-specific target scenario is computer-driven and scored from the after action review building. The range operating system is fully capable of providing immediate performance feedback to the using participants. All targetry are life-like precision targets that have reconfigurable plug and play capability.

Associated range operations and control facilities:

- Operations/storage building (17122).

- Ammunition breakdown building (17129).

- Latrine (73075).

- Small AAR building (17118).

Requirement document: FM 3-06, TC 90-1, FM 3-06.11

Additional information: A roof does not reduce 360-degree SDZ. It is there to reduce light, weather protection, enhance realism, and provide superstructure for an overhead crane if necessary.

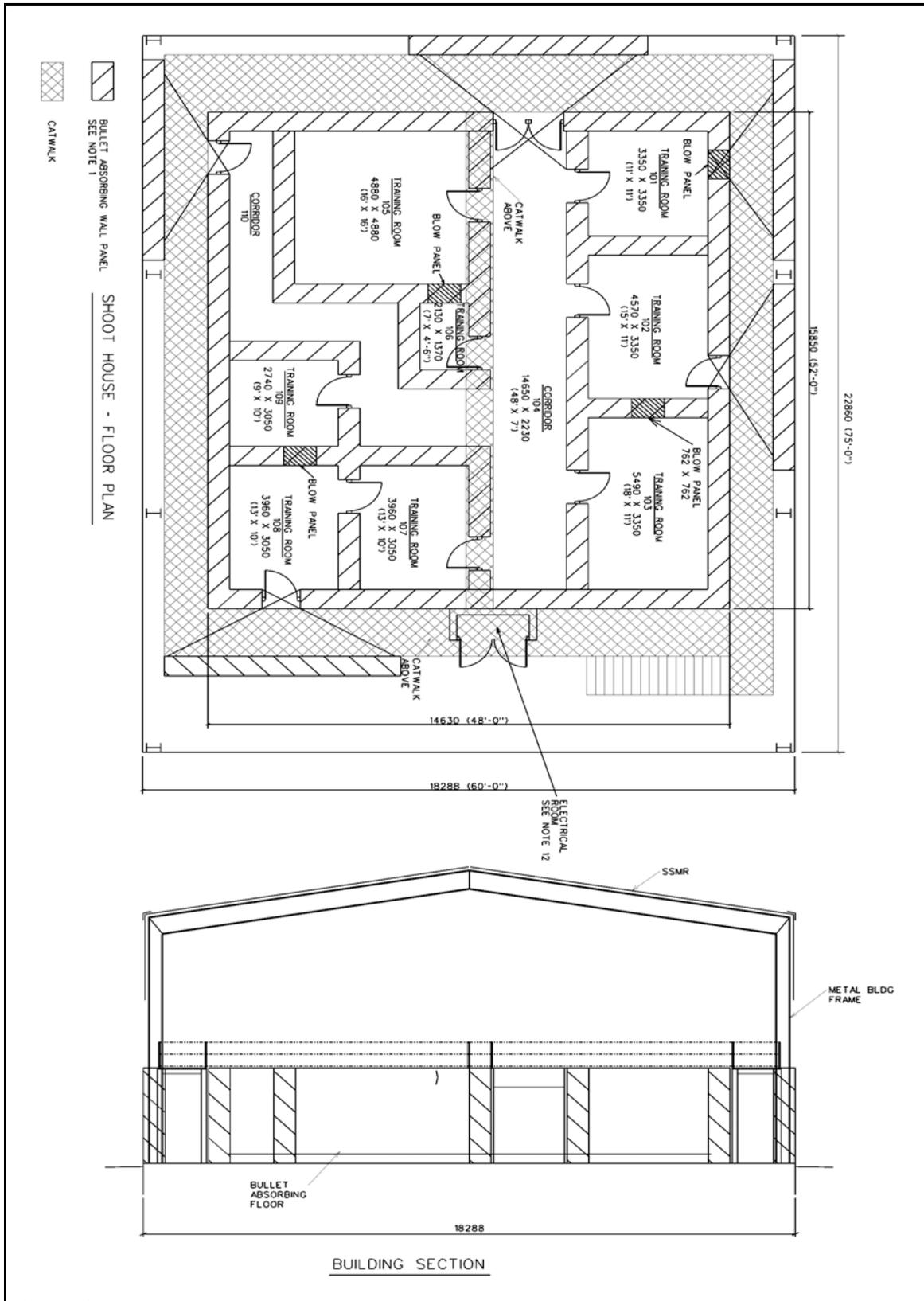


Figure D-25. Live-fire exercise shoothouse

FCC 17880 LIVE-FIRE EXERCISE BREACH FACILITY

The breach facility is used to train Soldiers on the skills necessary to breach windows, walls, and doors. It is also used to train TTPs and explosive techniques not trained on any other type of facility.

Primary features include—

- Station 1 - Door breaching structure.
- Station 2 - Window breaching structure.
- Station 3 - Wall breaching structure.

No automation is required for this facility.

Associated range operations and control facilities:

Latrine (73075) if not co-located with another range that has a range operations control area (ROCA)

Requirement document: FM 3-06, TC 90-1, FM 3-06.11

Additional information: The trainees must retreat to a position behind the retaining wall before detonating the explosive charge.

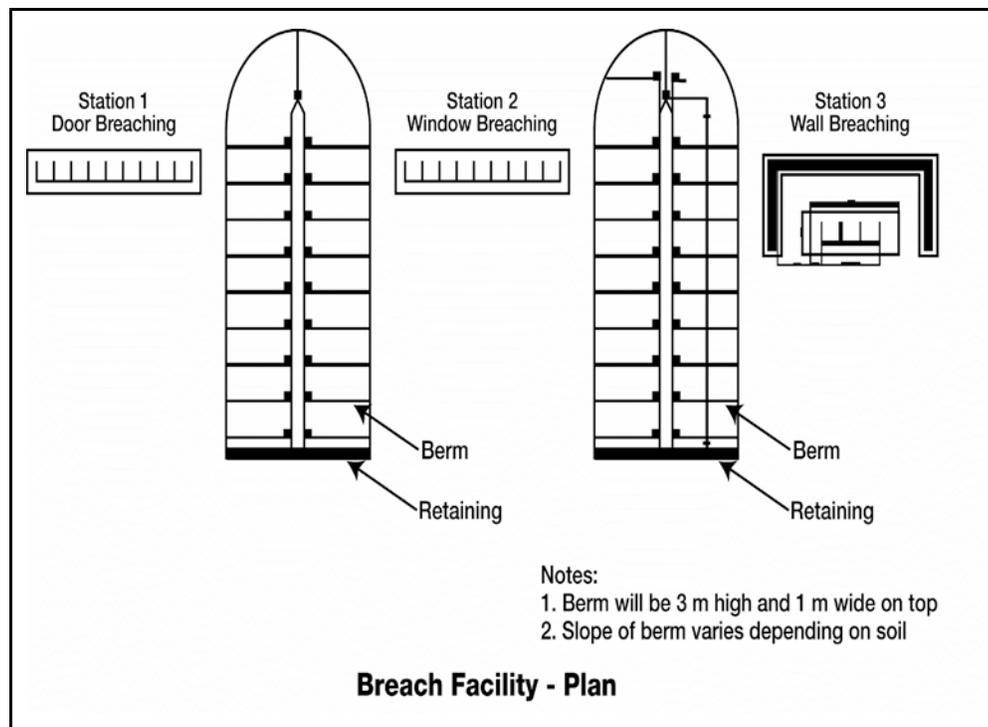


Figure D-26. Live-fire exercise breach facility

FCC 17882 Hand Grenade Qualification Course

This range is used to train and test individual Soldiers on the skills necessary to employ hand grenades against stationary target emplacements.

Primary features include—

7 Individual stations.

No automation is required for this facility. All targets/facades are fixed at required distances.

Associated range operations and control facilities:

Latrine (73075).

Bleacher enclosure (75061).

Covered mess (17116).

Requirement document: FM 3-23.30

Additional information: The qualification course allows Soldiers to use fused practice hand grenades to engage targets in natural terrain under simulated combat conditions.

Station 1 - Engage a group of F-type silhouettes in the open from two -man foxhole.

Targets 35 meters to front beyond squad's protective wire.

Station 2 - Engage a bunker with one or two firing portholes.

Station 3 - Engage a fortified 82 millimeter mortar position from 20 meters.

Station 4 - Engage a group of targets behind cover at a 20 meter distance.

Station 5 - Clear an entry point to a trench line at a 25 meter distance.

Station 6 - Engage troops in halted, open type wheeled vehicle at a 25 meter distance.

Station 7 - Identify hand grenades by shape, coloring, markings, and capabilities.

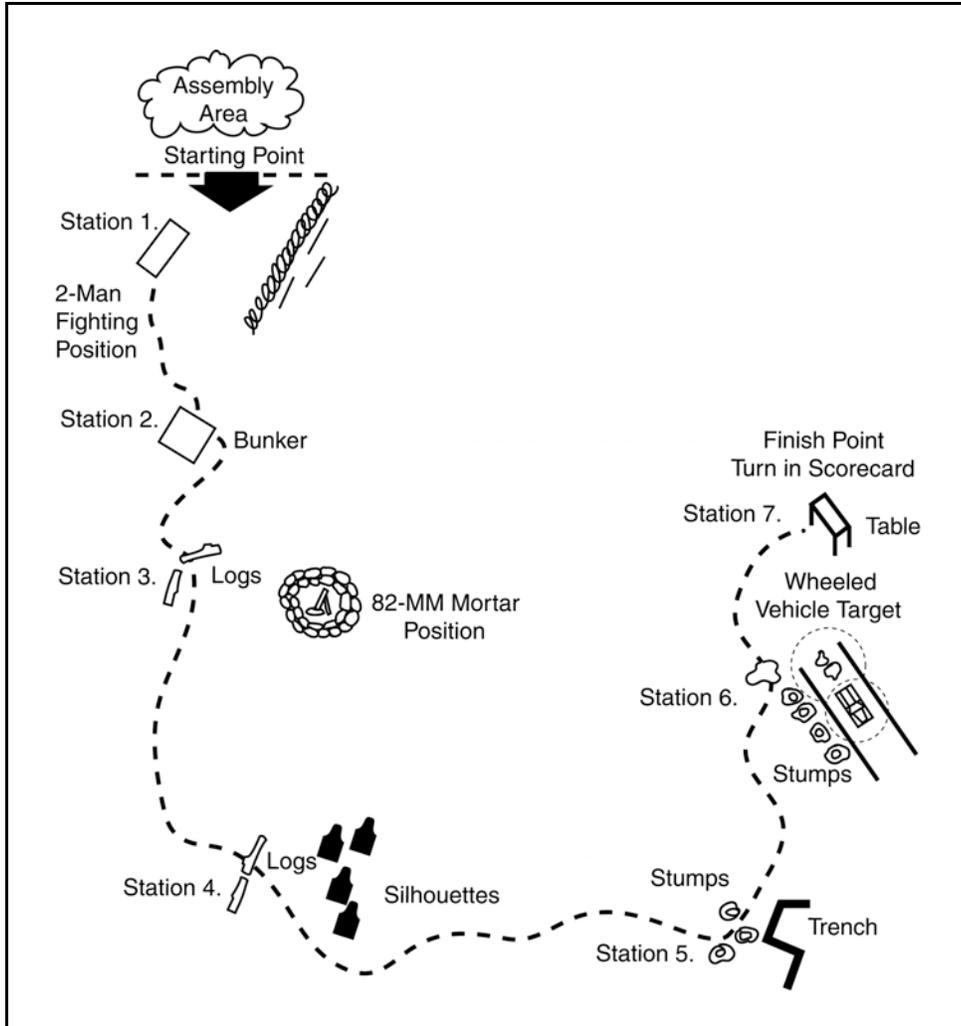


Figure D-27. Hand grenade qualification course

FCC 17883 HAND GRENADE FAMILIARIZATION RANGE

This range is used to train and test individual Soldiers in the employment of live fragmentation hand grenades.

Primary features include—

4 throwing bays.

The structural dimensions and configuration of the live-bay throwing pits are according to FM 3-23.30 and exceed the minimum safety standards within AR 385-63. No automation is required for this facility. All targets are fixed at required distances.

Associated range operations and control facilities:

Control bunker.

Latrine (73075).

Bleacher enclosure (75061).

Covered mess (17116).

Ammo breakdown building (17129).

Requirement document: FM 3-23.30, AR 385-63

Additional information: Steel, concrete, wooden revetments, or earthen berms 1.8-meter high should separate at least two of the bays from the other two and extend out 50 meters. This permits practice to continue on half the range if a dud occurs. Ideally, dividers separate all of the bays.

Sand-filled drums can provide an aiming point for the Soldier when throwing the grenade.

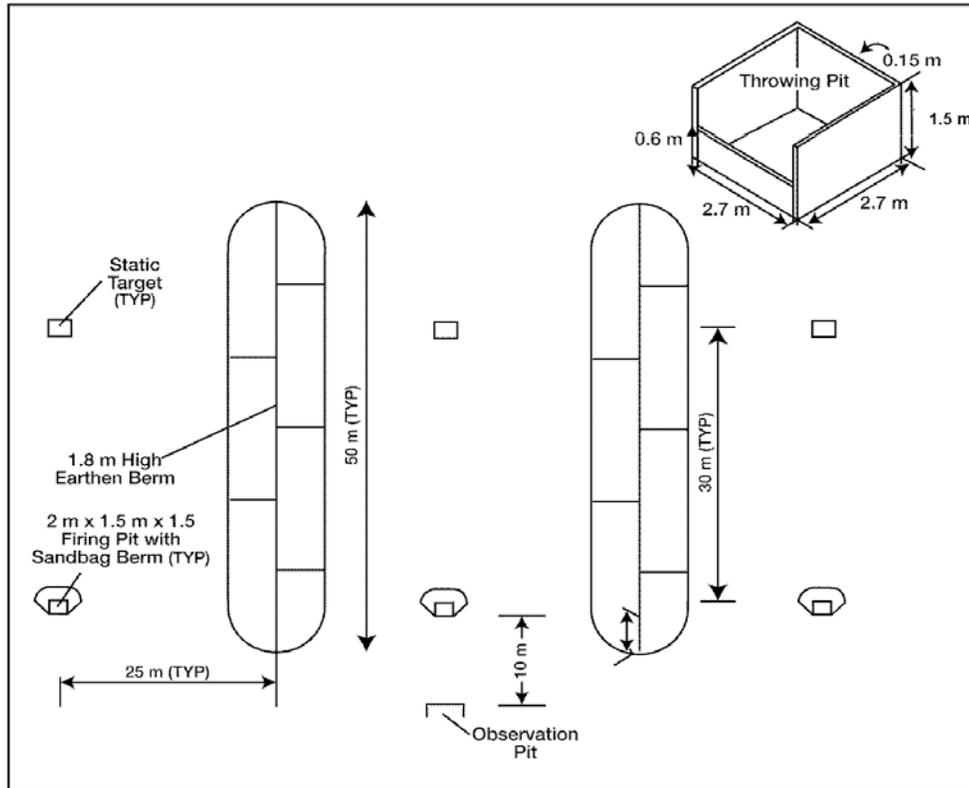


Figure D-28. Hand grenade familiarization range

17884 GRENADE LAUNCHER RANGE

This facility is used to train and test individual Soldiers on the skills necessary to engage and defeat stationary target emplacements with the 40-mm grenade launcher. The range has four self-contained stations and is 30 meters wide by 500 meters deep with a no-HE fire zone out to 165 meters. (Grenadiers can fire HE only on Stations 1, 3, and 4.) Targets should be built from durable materials to reduce downrange target maintenance. Those within each station must be grouped and spaced so that the grenadier may fire on close-range, mid-range, and long-range targets, in that order. The following description of the stations and targets is included to help trainers maintain control during zeroing, practice, and record fire.

Primary features include—

4 Individual firing stations.

Station 1: Consists of a prone fighting position with sandbags for support and a zeroing target at 200 meters. The target should be constructed of logs or other suitable material. It must have a surface at least 2 meters high by 2 meters wide (6 feet by 6 feet). The target should be clearly marked with a large "Z" painted in a color that contrasts with the surrounding background and that is visible in different sun or glare conditions.

Station 2: Consists of an upright log or log wall, a kneeling firing position about 4 feet high, and 2 point-type targets. The targets include a simulated window or door of a building at 100 meters and a small bunker or fighting position with overhead cover at 125 meters. The targets may be constructed of logs, sandbags, or other suitable material.

Station 3: Consists of a fighting position and two targets. The targets are a two-person bunker at 175 meters and an automatic weapon position at 200 meters. The bunker represents a point target, and the automatic weapon position represents an area target. The targets may be constructed of logs, sandbags, or other suitable material.

Station 4: Consists of a prone fighting position with a log or sandbag support and two area-type targets (with personnel targets in the open) at 250 and 350 meters. The log or sandbags at the firing position are used for support and cover. The targets are E-type and F-type shaped silhouette and are made out of durable materials.

No automation is required for this facility. All targets/facades are fixed at required distances.

Associated range operations and control facilities:

Standard SAROCA facilities.

Exclude: Classroom Facility (17123).

Operations storage (17120).

Requirement document: FM 3-22.31, AR 385-63

Additional information: Zero targets are at least 2 meters high and 2 meters wide. Zero target is clearly marked with a large contrasting "Z".

Targets are made of long-lasting, durable material that can withstand constant use with little maintenance. Salvaged oil drums filled with sand make excellent semi permanent target material for this range. HE can only be fired on stations 1, 3, and 4.

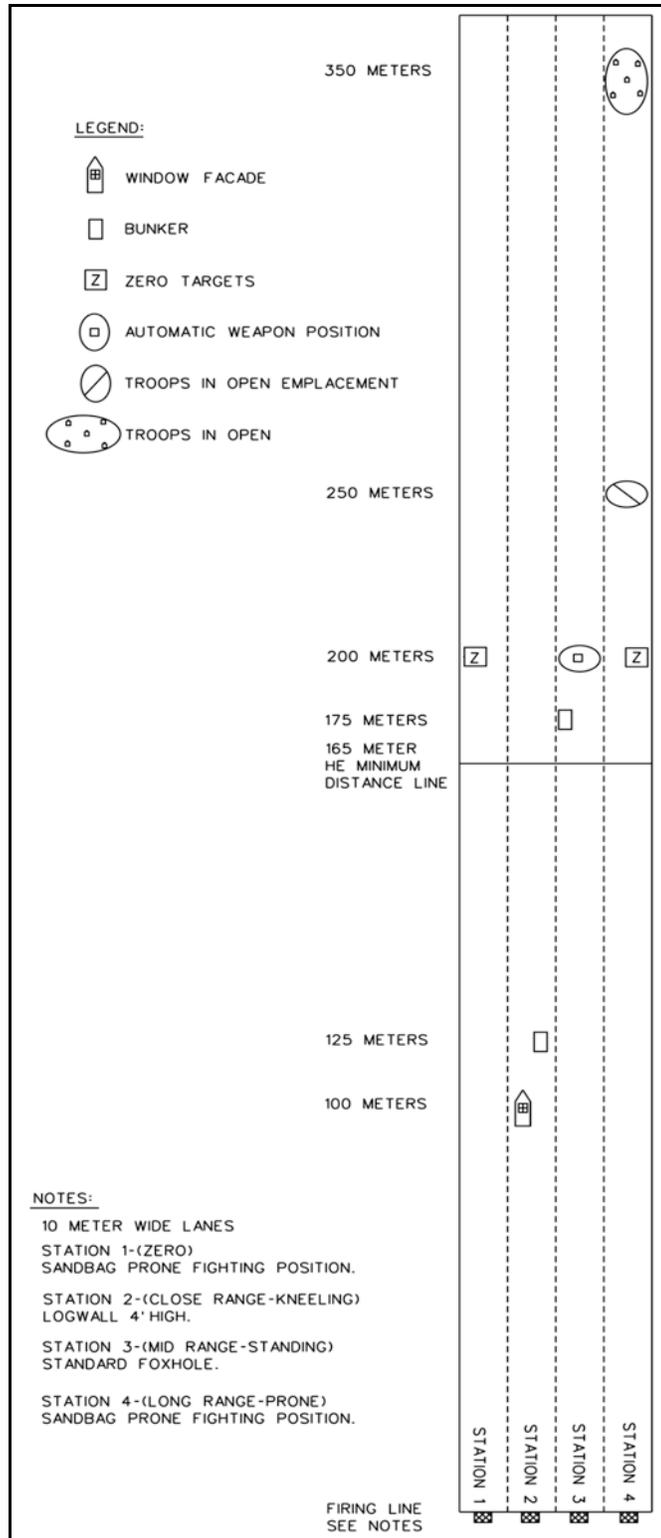


Figure D-29. Grenade launcher range

FCC 17885 LIGHT DEMOLITION RANGE

This range is used to train individual Solders on the employment techniques of explosives and demolitions.

Primary features include—

Safety berms (on each side of demolition points).

3 missile-proof shelters.

Ammunition breakdown building.

No automation is required for this facility.

Associated range operations and control facilities:

Latrine (73075).

Requirement document: FM 3-34.214, FM 5-34, FM 5-102, FM 3-34.210

Additional information: Wire obstacle: width - 7 meters; length – 20 meters. Use one Bangalore kit to breach the obstacle.

Minefield: width – 10 meters; length – 20 meters. Mines may be placed on the surface or buried.

Steel-cutting chamber has a ledge to mount steel or concrete beams. Steel and concrete beams vary in width and length.

Timber-cutting site: width – 10 meters; length – 35 meters. There are 8 concrete base supports (4 on each side of road) for placement of logs. Poles should be no larger than 36 centimeters in diameter and no taller than 10 meters.

Charges should be placed to prevent damage to the concrete base.

Concrete obstacle is constructed with concrete cubes or tetrahedrons. It is 10 x 30 meters.

The road crater site must be refilled after each use.

For minimum safety distance for personnel, refer to DA Pam 385-63, Range Safety.

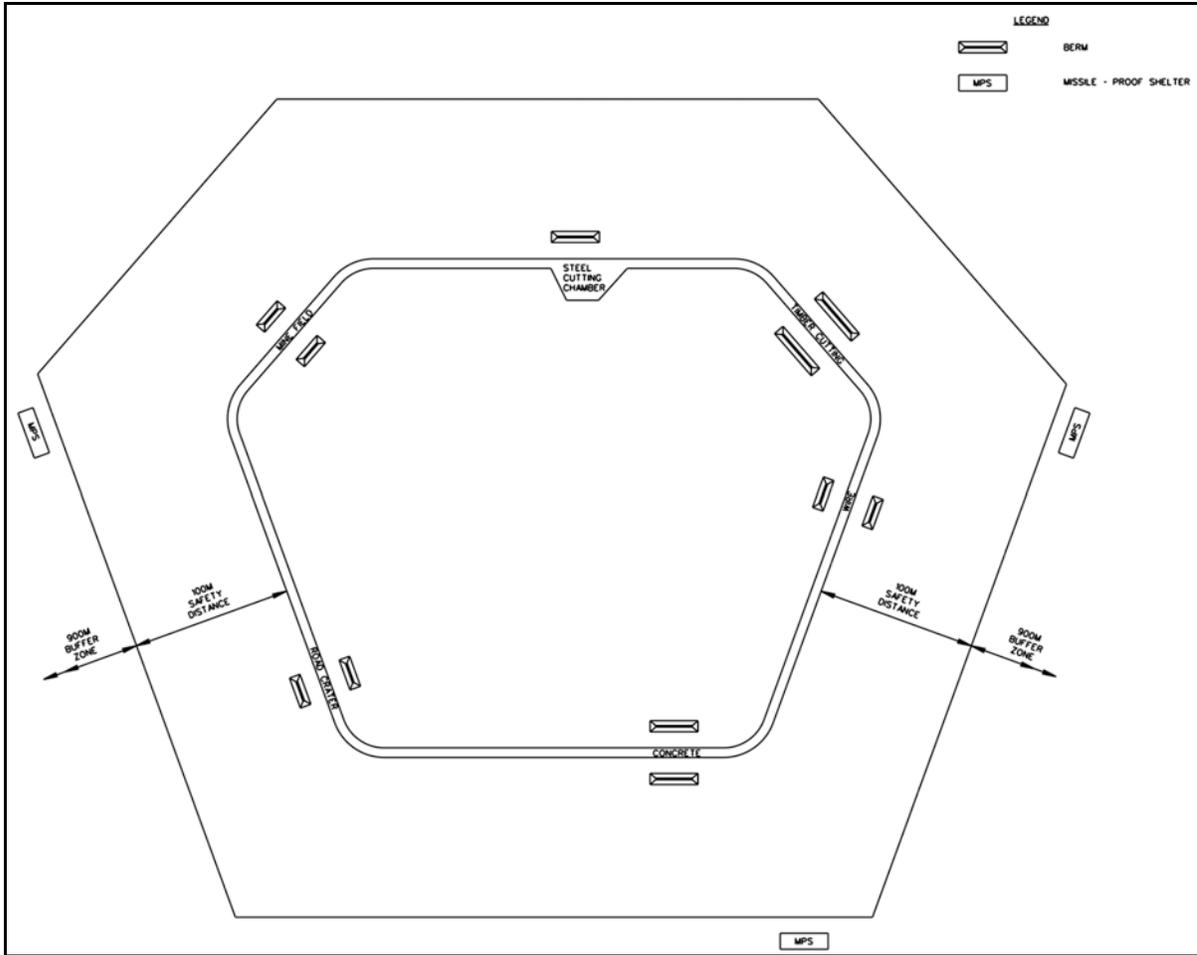


Figure D-30. Light demolition range

FCC 17891 INFILTRATION COURSE

This range is used to train individual Soldiers on combat movement techniques in a realistic live-fire environment.

Primary features include—

- 80 x 100 meters movement area.
- 3 fixed machine gun positions (with safety measures installed).
- 2 barbed wire obstacles.
- 9 demolition pits.
- 2 log obstacles.

No automation is required for this facility.

Associated range operations and control facilities:

- Control tower (17971).
- Operations/storage building (17122).
- Bleacher enclosure (75061).
- Covered mess (17116).
- Latrine (73075).

Requirement document: FM 3-55.93, FM 7-92, STP 21-1-SMCT, FM 3-21.75

Additional information: Construct surface danger fans for each machine gun; establish firing procedures and overhead clearance of personnel in accordance with AR 385-63/DA Pam 385-63.

When the range is opened, test fire each machine gun. Conduct test firings before each use of the range to determine dispersion pattern. Use machine gun traverse and elevating stops to prevent firing beyond the right and left limits of fire or below minimum elevations.

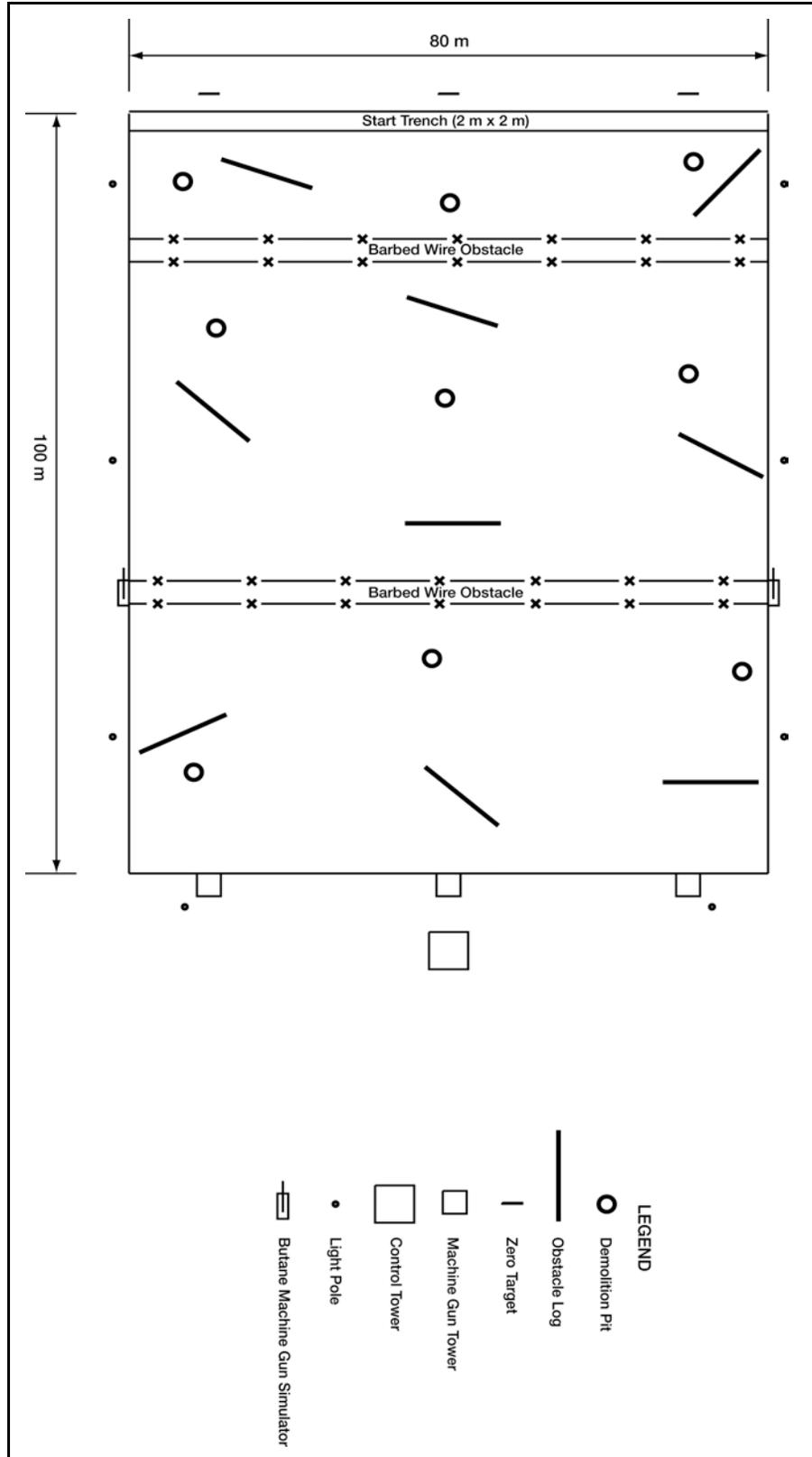


Figure D-31. Infiltration course

FCC 17892 FIRE AND MOVEMENT RANGE

This range is used to train individual Soldiers and buddy/teams on basic fire and movement techniques against stationary infantry targets. Soldiers show their ability to select covered and concealed positions, move while under fire, apply principles of teamwork, and use suppressive fire on enemy soldier targets.

Primary features include—

- 4 lanes.
- 24 stationary infantry targets (six per lane).
- 3-meter high berms along each side of the lanes

Targets are not fully automated and/or the scenarios are not computer-driven or scored.

Associated range operations and control facilities:

- Control tower (17971).
- Operations/storage building (17122).
- Bleacher enclosure (75061).
- Covered mess (17116).
- Ammo breakdown building (17129).
- Latrine (73075).

Requirement document: FM 3-21.8, TC 7-9, STP 21-1-SMCT, FM 3-21.75

Additional information: All lanes should have natural features that offer cover and concealment.

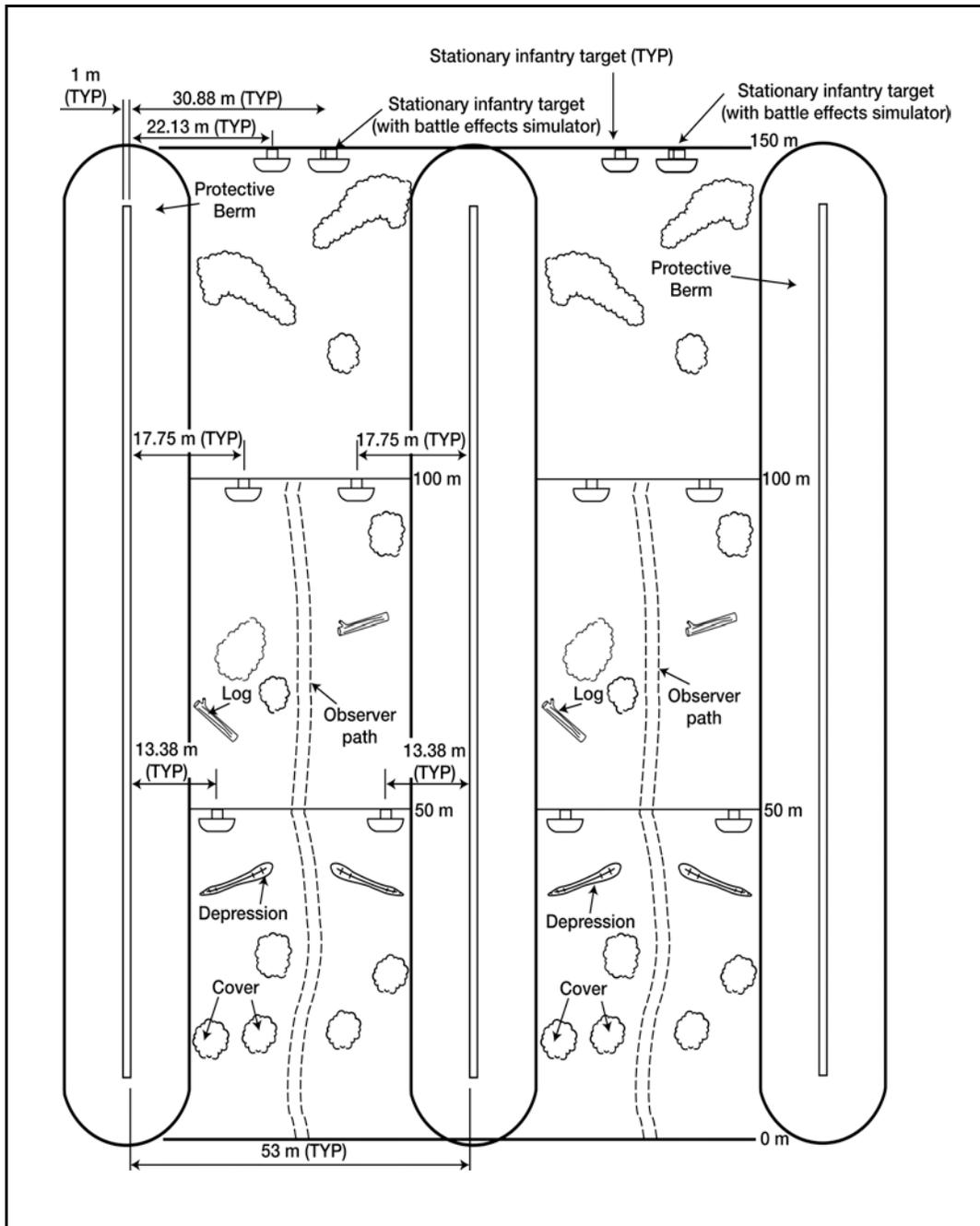


Figure D-32. Fire and movement range

FCC 17893 SQUAD DEFENSE RANGE

This range is used to train individuals and squads on employing mutually supporting fires from defensive positions against stationary infantry targets.

Primary features include—

5 two-man fighting positions (foxholes).

31 stationary infantry targets.

All targets are fully automated and the event specific target scenario is computer-driven and scored from the range operations center. 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 3-21.8, TC 7-9

Additional Information: Each defensive position will have a right and a left sector of fire. Within each there will be five targets on either side of the position, which will be staggered at distances of 25 meters, 50 meters, 100 meters, 200 meters, and 300 meters, measured from the firing position.

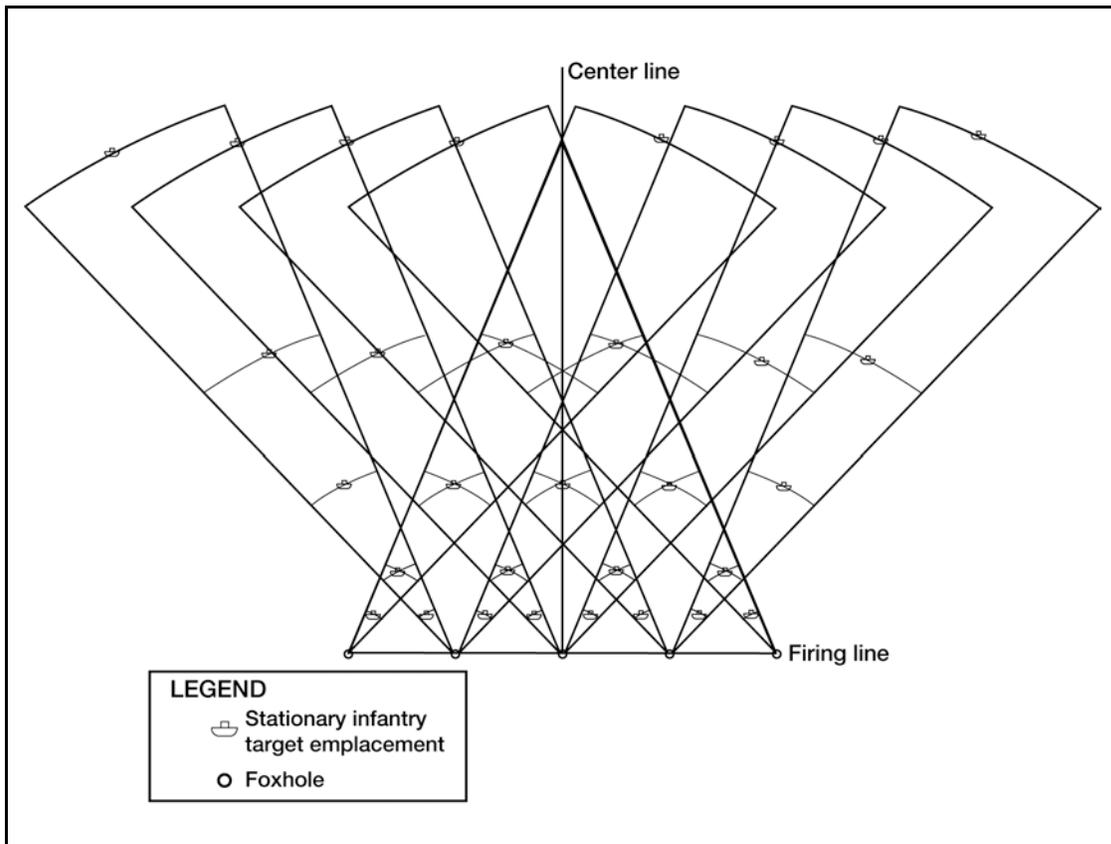


Figure D-33. Squad defense range

FCC 17895 INFANTRY SQUAD BATTLE COURSE (ISBC)

This complex is used to train and test infantry squads on the skills necessary to conduct tactical movement techniques; and detect, identify, engage ,and defeat stationary and moving infantry and armor targets in a tactical array.

Primary features include—

- 6 stationary armor targets.
- 1 moving armor target.
- 20 stationary infantry targets.
- 6 moving infantry targets.
- 2 trench obstacles.
- 5 machine gun/observation bunkers (with sound effects simulator).

All targets are fully automated, and the event-specific target scenario is computer-driven and scored from the range operations center. 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 3-21.8, ARTEP 7-8 Drill, TC 7-9

Additional Information: Target locations are site adapted to meet established training requirements.

All trenches, bunkers, and target emplacements must simulate typical threat scenarios.

Ten mortar simulation device emplacements are located in areas from which unfriendly mortar fire is to be simulated. Each emplacement will contain one battle/sound effects simulator each.

Helicopter landing areas, designed for heavy use, should be located to support aerial insertion and extraction of the squad.

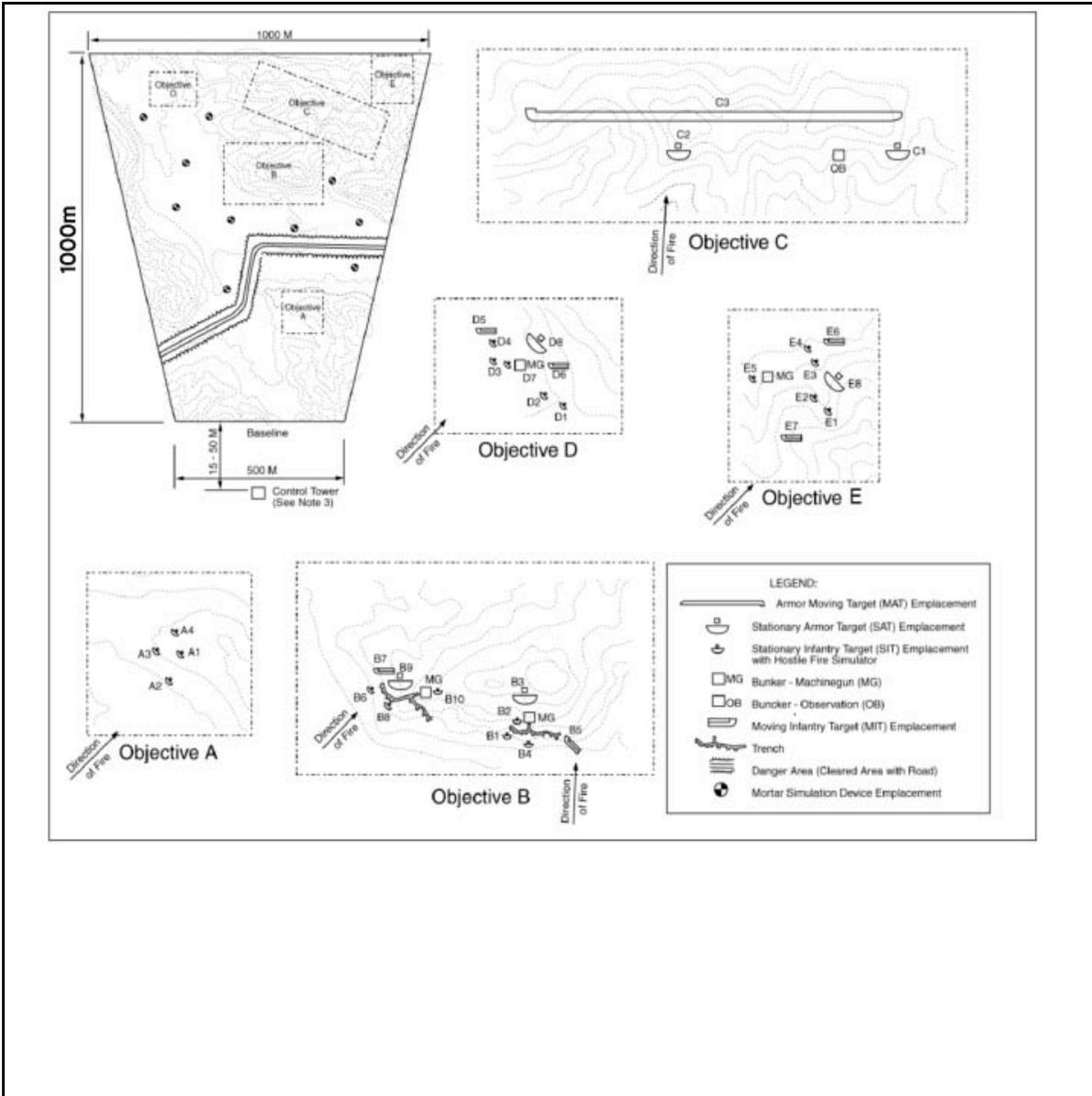


Figure D-34. Infantry squad battle course

FCC 17897 INFANTRY PLATOON BATTLE COURSE (IPBC)

This complex is used to train and test infantry platoons, either mounted or dismounted, on the skills necessary to conduct tactical movement techniques, and detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array.

Primary features include—

- 6 stationary armor targets.
- 1 moving armor target.
- 43 stationary infantry targets.
- 14 moving infantry targets.
- 1 trench obstacles.
- 9 machine gun bunkers (with sound effects simulator).
- 2 landing zones.
- 1 assault/defend house.

All targets are fully automated, and the event-specific target scenario is computer-driven and scored from the range operations center. 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 3-21.8, ARTEP 7-8 Drill, FM 3-20.98, FM 3-21.71, TC 7-9

Additional information: Target locations are site adapted to meet established training requirements.

All trenches, bunkers, and target emplacements must simulate typical threat scenarios.

Eight mortar simulation device emplacements are located in areas from which unfriendly mortar fire is to be simulated. Each emplacement will contain one battle/sound effects simulator each.

Helicopter landing areas, designed for heavy use, should be located to support aerial insertion and extraction of the platoon.

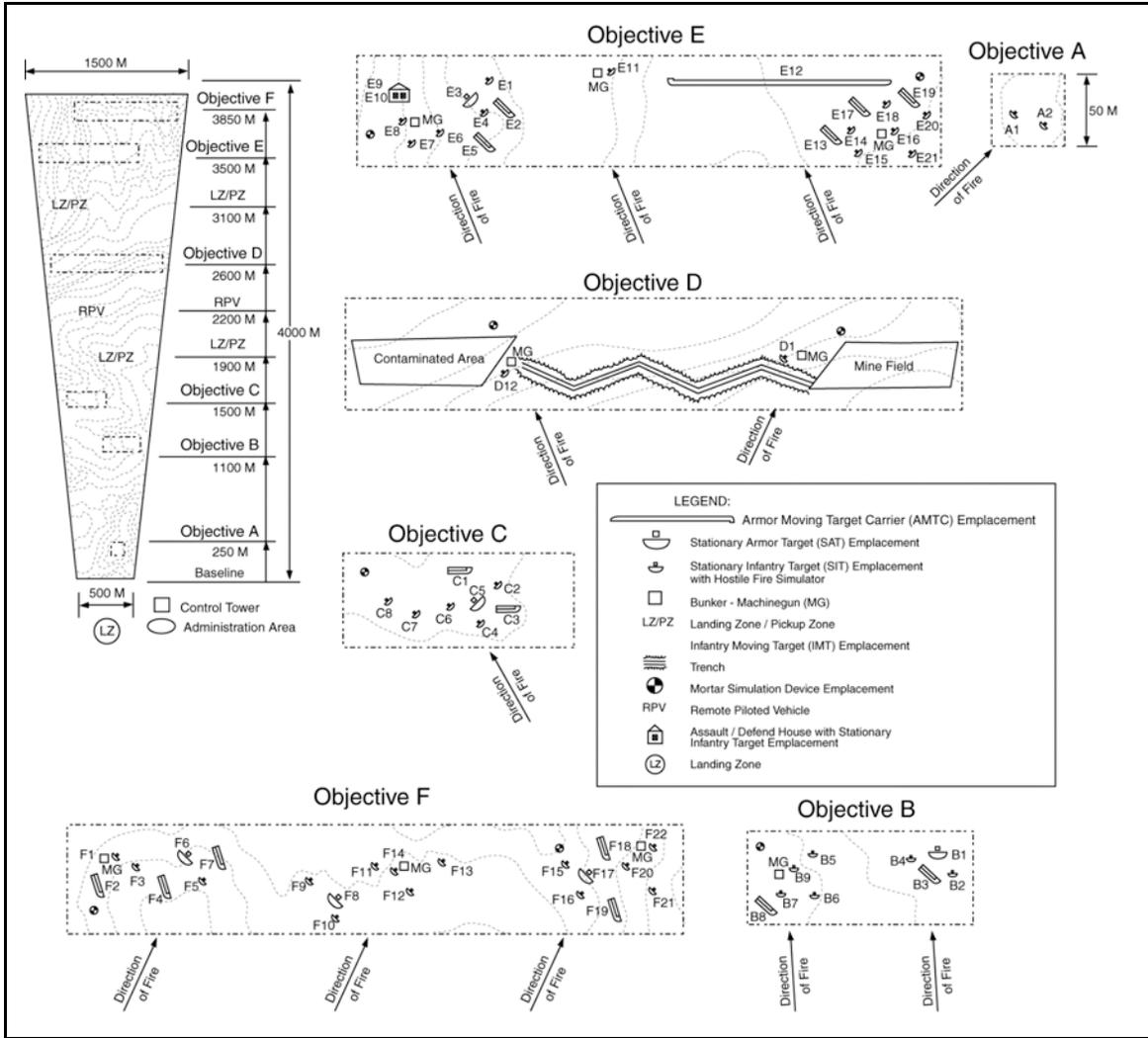


Figure D-35. Infantry platoon battle course

FCC 17901 COMBINED ARMS COLLECTIVE TRAINING FACILITY (CACTF)

The CACTF is a training facility designed to conduct multiechelon, full-spectrum operations training up to battalion Task Force (TF) level. The CACTF replicates an urban environment, and the facility consists of 2.25 square kilometers of urban sprawl with 20 to 26 buildings, roads, alleys, parking areas, underground sewers, parks, athletic fields, and command and control building. The actual size and configuration of the CACTF depends on the local installation site requirements. The CACTF is designed to support heavy and light infantry, armor, artillery, and aviation positioning and maneuver. The CACTF will accommodate force-on-force (FOF) and force-on-target (FOT) training.

Primary features include—

- 1 school.
- 1 church/cemetery.
- 1 police station/jail.
- 1 hotel.
- 9 residences.
- 4 businesses.
- 1 townhouse.
- 1 bank.
- 2 warehouses.
- 1 government building.
- 1 office.
- 1 service station.
- Tunnel/sewer system.

Targets:

- 30 human urban targets (HUTs)(interior building use).
- 15 stationary infantry targets (SITs) (recommend RF/reconfigurable).
- 9 stationary armor targets (SATs) (recommend RF/reconfigurable).

Associated range operations and control facilities:

- CACTF, Range Operations Center/After action review building (17123).
- Operations/storage building (17122).
- Latrine (73075).
- Covered mess (17116).

All targets are fully automated, using event-specific, computer-driven target scenarios and scoring. Targets will receive and transmit data from the range operations center. The captured data is then compiled and available to the unit during the after action review. The HUTs are life-like precision targets that have reconfigurable plug and play capability.

Additional (Expansion) Training Features—

- Mock airfield facilities.
- Shanty town.
- Military/POW compound.
- Farmhouse.
- Junkyard.
- Radio station.
- Mock power station.
- Clinic.

Camera Coverage Requirement:

All buildings/rooms have camera and target outlets available (100% coverage). The facility will receive enough cameras to view 80 percent of the rooms within 80 percent of the buildings for AAR purposes. All cameras are plug and play, therefore they may be relocated within the buildings for coverage in any preferred room; considerations must be given to hallways and stairwells. Outside cameras are provided to cover the primary avenue of approach into the CACTF, unit tactical movement, and safety in and around the facility. A methodical visual line of site analysis is required to strategically position the cameras for maximum coverage based on the site location. During design/planning phases of all projects the designing agent will coordinate with the training/combat and material developers to determine required number and locations of outside cameras to ensure applicable infrastructure is provided.

Live-fire ballistic ammunition is prohibited on this facility. Pyrotechnics are not authorized for training in the tunnel system.

Requirement Document: TC 90-1, FM 3-06, FM 3-06.1, FM 3-06.11, FM 3-22.9, FM 3-21.8

Additional Information: The ROCA should not be located in the immediate vicinity of the urban training area.

The training buildings have one, two, or three stories (some with basements) with sloped and flat roofs.

Loopholes in roofs and outside walls allow observation and fields of fire.

Constructed mouse holes permit movement between rooms and floors.

Roof hatchways lead to the top floors of multiple story buildings.

The street network includes one- and two-lane primary, secondary, local, service roads, and alleyways.

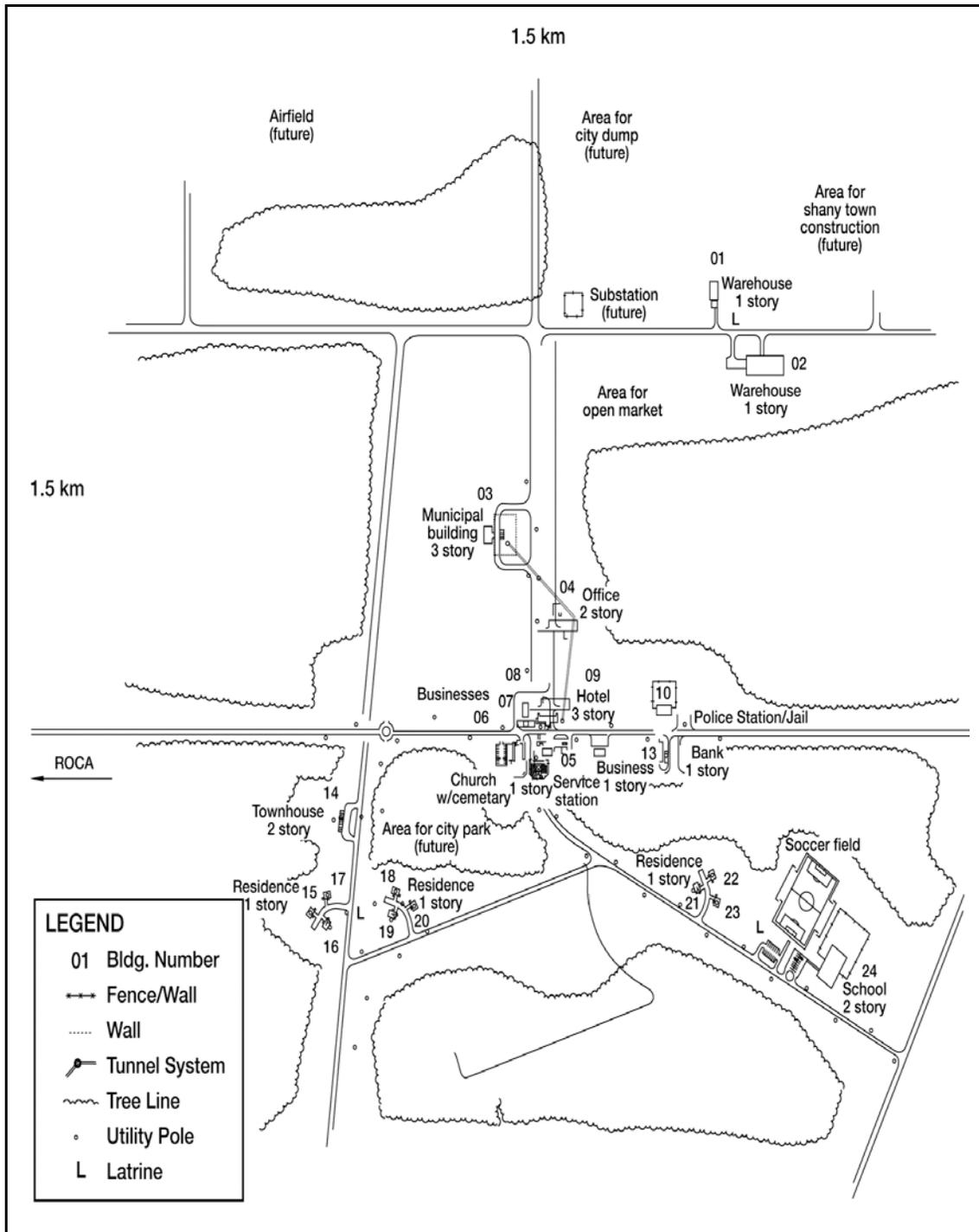


Figure D-36. Combined arms collective training facility

FCC 17996 COLLECTIVE TRAINING FACILITY (CTF)

The CTF is a training facility designed to conduct multi-echelon, full-spectrum operations training up to company level. The CTF replicates an urban environment, and the facility consists of 1.5 square kilometers of urban sprawl with 10 to 16 buildings, roads, alleys, parking areas, underground sewers, parks, athletic fields, and command and control building. The actual size and configuration of the CTF depends on the local installation site requirements. The CTF is designed to support heavy and light infantry, armor, artillery, and aviation positioning and maneuver. The CTF will accommodate force-on-force (FOF) and force-on-target (FOT) training.

Primary features include—

- 1 school.
- 1 church/cemetery.
- 1 police station/jail.
- 1 hotel.
- 3 residences.
- 3 businesses.
- 1 townhouse.
- 1 bank.
- 1 warehouse.
- 1 government building.
- 1 office.
- 1 service station.
- Tunnel/sewer system.
- Residence/Office Building Rubble (Optional).

Additional (Expansion) Training Features—

- Mock airfield facilities.
- Shanty town.
- Military/POW compound.
- Farmhouse.
- Junkyard.
- Radio station.
- Mock power station.

Targets:

- 20 Human Urban Targets (HUTs) (interior building use).
- 10 stationary infantry targets (SITs) (recommend RF/reconfigurable).
- 9 stationary armor targets (SATs) (recommend RF/reconfigurable).

Associated range operations and control facilities:

- CACTF, Range Operations Center/After action review building (17123).
- Operations/storage building (17122).
- Latrine (73075).
- Covered mess (17116).

Camera Coverage Requirement:

All buildings/rooms have camera and target outlets available (100% coverage). The facility will receive enough cameras to view 80 percent of the rooms within 80 percent of the buildings for AAR purposes. All cameras are plug and play, therefore they may be relocated within the buildings for coverage in any preferred room; considerations must be given to hallways and stairwells. Outside cameras are provided to cover the primary avenue of approach into the CACTF, unit tactical movement, and safety in and around the facility. A methodical visual line of site analysis is required to strategically position the cameras for maximum coverage based on the site location. During design/planning phases of all projects the designing agent will coordinate with the training/combat and material developers to determine required number and locations of outside cameras to ensure applicable infrastructure is provided

Live-fire ballistic ammunition is prohibited on this facility. Pyrotechnics are not authorized for training in the tunnel system.

Requirement Document: TC 90-1, FM 3-06, FM 3-06.1, FM 3-06.11, FM 3-22.9, FM 3 21.8

Additional Information:

The training buildings should have one, two, or three stories (some with basements) with sloped and flat roofs.

Loopholes in roofs and outside walls should allow observation and fields of fire.

Constructed mouse holes should permit movement between rooms and floors.

Roof hatchways should lead to the top floors of multiple story buildings.

The street network should include one- and two-lane primary, secondary, local, service roads, and alleyways.

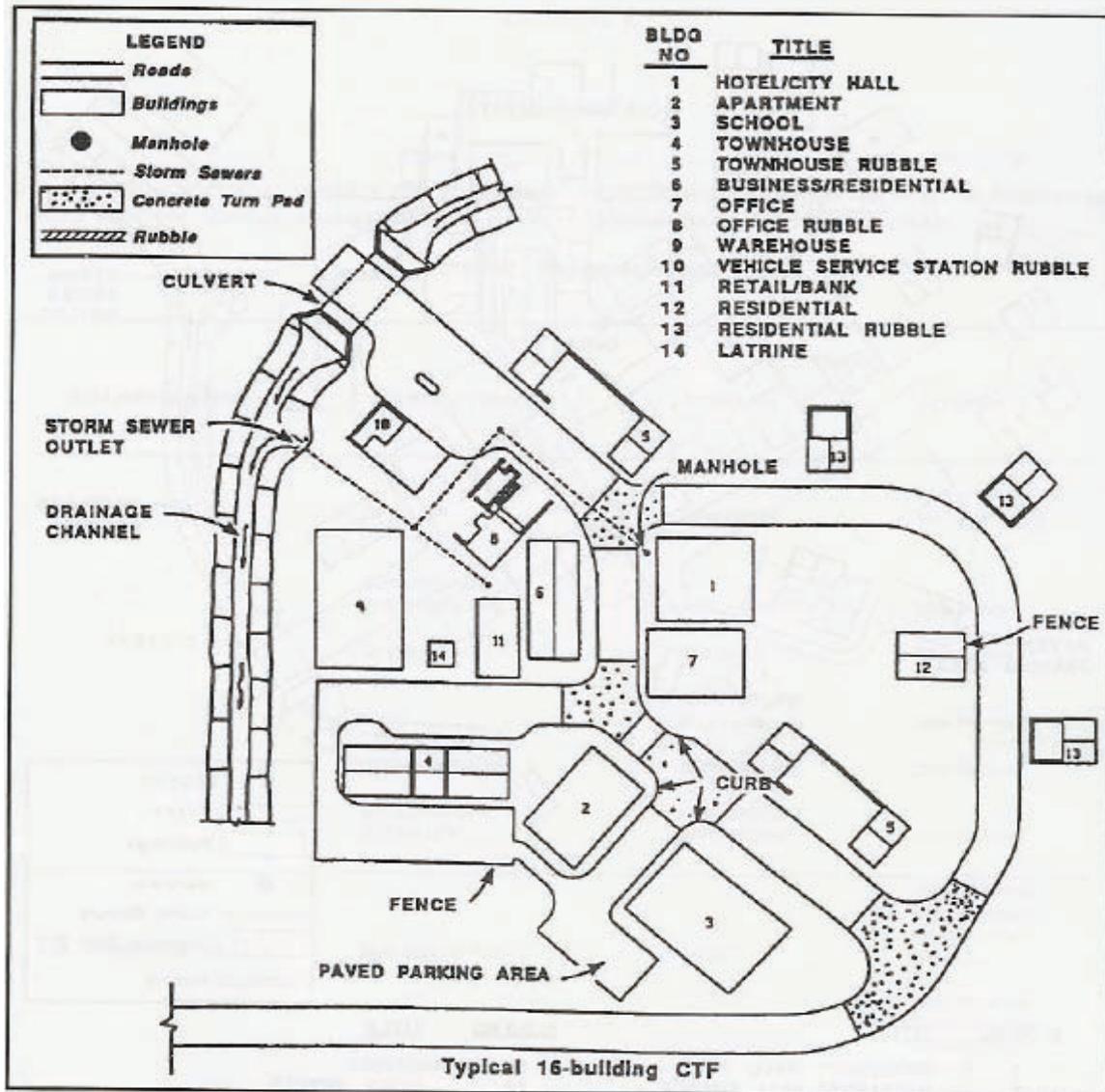


Figure D-37. Collective training facility

FCC 1771 CONVOY LIVE FIRE RANGE (CLF)

This complex is used to train and test Convoy Live Fire crews, platoons, and companies on the skills necessary to detect, identify, engage and defeat stationary and moving vehicle and infantry targets from a stationary or moving platform using all assigned weapons and weapon systems. It is also designed to satisfy the training and qualification requirements for the crews and sections of unstabilized platforms. The targets may be presented individually or as part of a tactical array in an open or urban environment. This complex is also used to train and test Soldiers to engage and defeat vehicle and Infantry targets from multiple firing points as part of an entry control point (ECP).

Primary features include—

- 5 stationary armor targets.
- 4 moving armor targets.
- 43 stationary infantry targets.
- 3 moving infantry targets.
- 6 facades.
- 1 course road.

The ECP targets are fully automated, and scored from the range operations and storage building. They are fully capable of providing immediate performance feedback to the using participants. All other targets are reconfigurable/RF and controlled with a hand-held device.

Associated Range Operations and Control facilities:

- All facilities are located with the entry control point.
- Operations/storage building (17122).
- Latrine (73075).
- Ammunition breakdown building (17129).

Requirement Document: TC 63-1, FM 3-22.9, FM 3-22.68, FM 3-22.65, FM 3-22.27, FM 5-34, FM 4-01.45, TSP-Convoy Survivability

Additional Information:

Gunnery tasks requiring the use of dud-producing ammunition cannot be fired on this range.

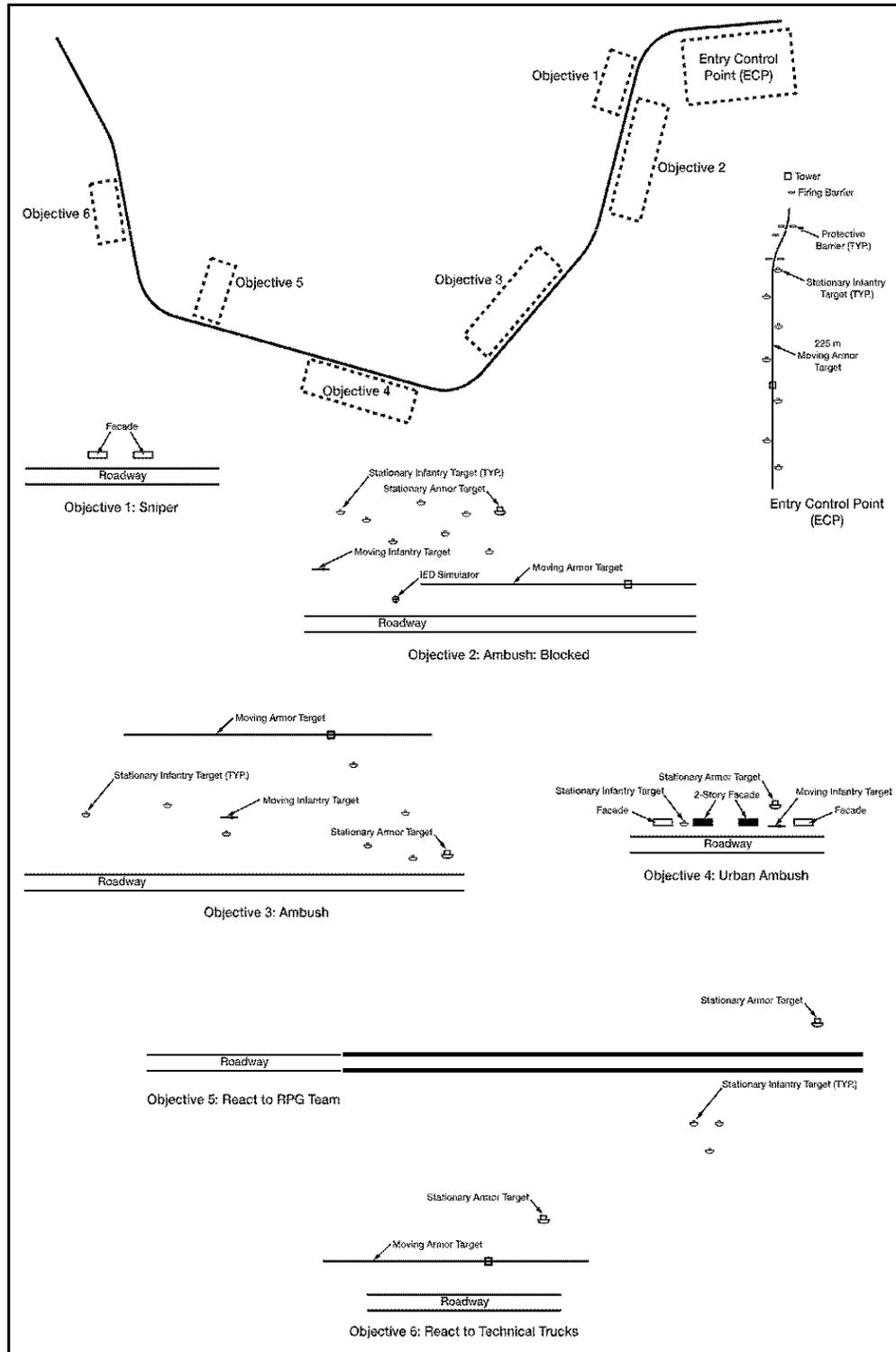


Figure D-38. CLF range/entry control point

FCC 17910 BORESIGHT, SCREENING AND HARMONIZATION RANGE

This facility is designed to boresight, zero, screen, and harmonize Abrams, Bradley, Stryker/MGS and Aviation weapon systems for live-fire training and qualification.

Primary features—

- 8 stationary armor targets (SATs).
- 8 stationary infantry targets (SITs).
- 8 boresight panels.
- 1 sync ramp.

The four 1,500-meter screening targets are equipped with noncontact hit sensors that provide LOMAH-type capability for accurate screening of weapon systems. All targets are fully automated and controlled from the range operations center tower.

Associated range operations and control facilities:

- Range operations center, tower (17971).
- Latrine (73075).

Requirement document: FM 3-20.21, FM 3-22.3, FM 3-04.140

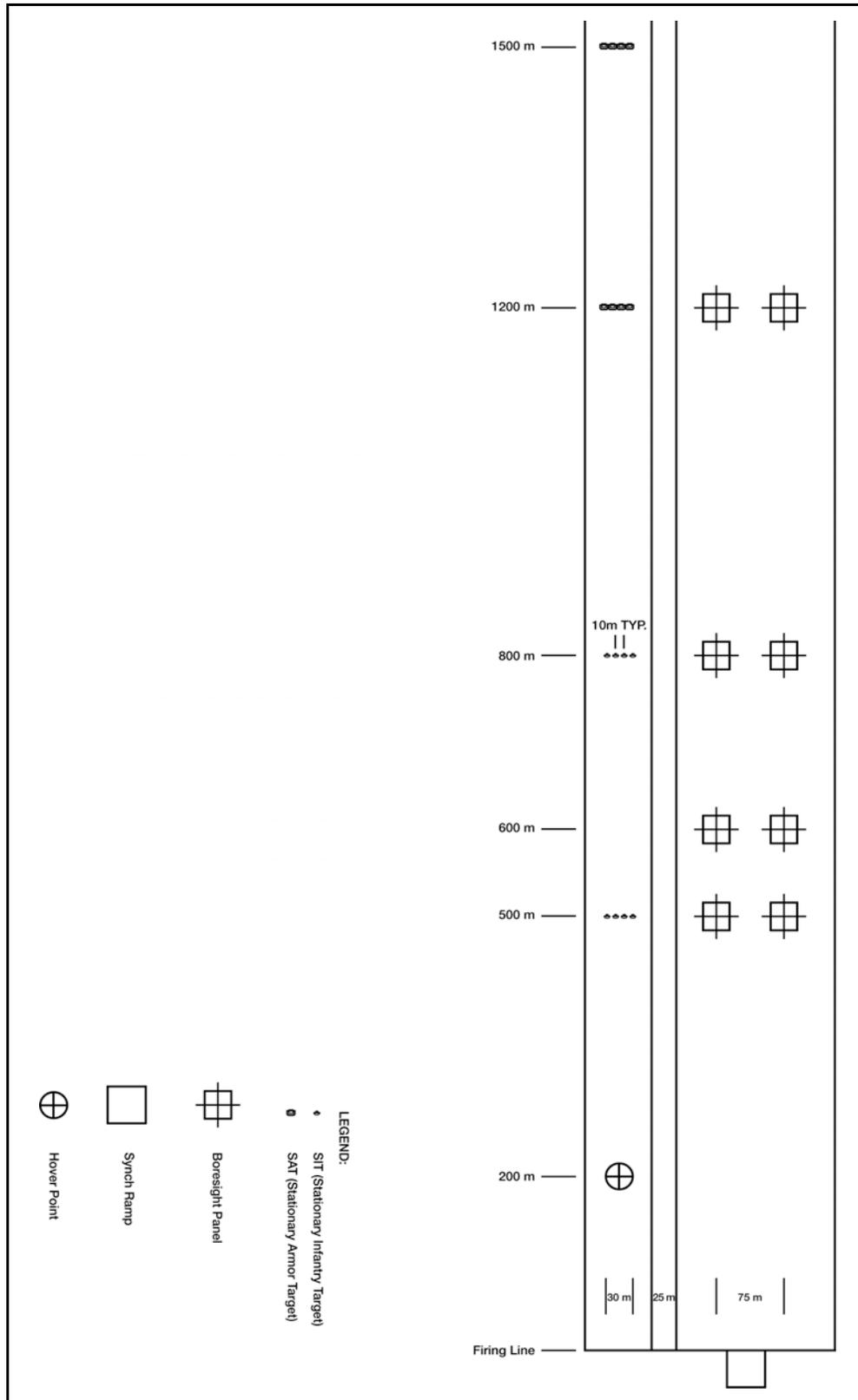


Figure D-39. Boresight, screening, and harmonization range

FCC 17912 AERIAL GUNNERY RANGE

This complex is used to train and test aviation, unstabilized platforms and convoy live fire crews, teams, platoons, and companies/troops on skills necessary to detect, identify, and effectively engage stationary and moving infantry and/or armor targets in a tactical array. Company combined arms live fire exercises (CALFEX) and advanced tables may be conducted on this facility. This complex also accommodates training with subcaliber and/or laser training devices. This complex supports dismounted infantry platoon tactical live-fire operations either independently of, or simultaneously with, supporting vehicles. 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 Aerial Gunnery Range will enable critical air-ground integration tactics, techniques, and procedures (TTP) training to ensure the optimum teaming of Army ground and aerial platforms. Primary features include a Primary Area (threshold) and an Alternate Area (objective). After Action Review (AAR) facility, Aviation FARP, tower, aerial firing points, and aircraft holding area is also required. Construction of these facilities may be considered as a DAGIR alternative at installations that do not provide training venues for Combat Aviation Brigades (CABs) or smaller units. A Convoy Live Fire route is included with the use of the crossover roads.

Primary Features Include—

Primary (threshold) - footprint is 4k x 6k. (Meets minimum standards of Aviation unit table's I-XII and CALFEX).

50 stationary armor targets.

8 moving armor targets.

246 stationary infantry targets (35 clusters with 6 SIT's, 3 SIT's per facade).

35 moving infantry targets (one per SIT cluster).

12 facades.

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

1 Convoy Live Fire lane (extends into objective area A if available).

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

1 Air/Ground Integration Village (13 buildings – mixture of one/two/three story modular construction, non-live fire within the urban area) surrounded by modular structures/stationary targets to enable live fire engagement by Aviation assets.

Alternate (objective) - 1k lateral extension on both sides of threshold, and a 3k extension in depth. (Allows greater dispersion of targets and separation of firing vehicles to maximize capabilities of digital platforms during advanced tables).

15 stationary armor targets.

2 moving armor targets.

60 stationary infantry targets (10 clusters with 6 SIT's each).

10 moving infantry targets (one per SIT cluster).

1 urban cluster (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.

Static targets (to support indirect fire/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. AWSS scoring data will be compiled and available to the unit during the after action review. ROC-V image in visual and FLIR spectrum is the objective. Target emplacement must enable protection and resilience from training munitions fired from diving-fire angles of 15-30 degrees as provided in FM 3-04.140 and aircrew training manuals.

Up-range facilities/components

Aviation/range control tower, 10-point FARP, and adequate AAR facilities are provided as basic infrastructure.

Instrumentation requirements: The Aerial Gunnery Range will leverage Aviation TESS to enable After Action Review (AAR). Fiber optic connectivity will be included to enable growth and LVC connectivity. DAGIR player unit will be capable of supporting force on target (T) and force on force (O) training.

Required Document: FM 3-04.140, FM 3-04.111, FM 3-20.21, 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 range operations center/tower must have the capability to communicate with firing platforms. All stationary/moving infantry targets will be equipped with a muzzle flash simulator. Diving fire targets will provide ROC-V compatible image.

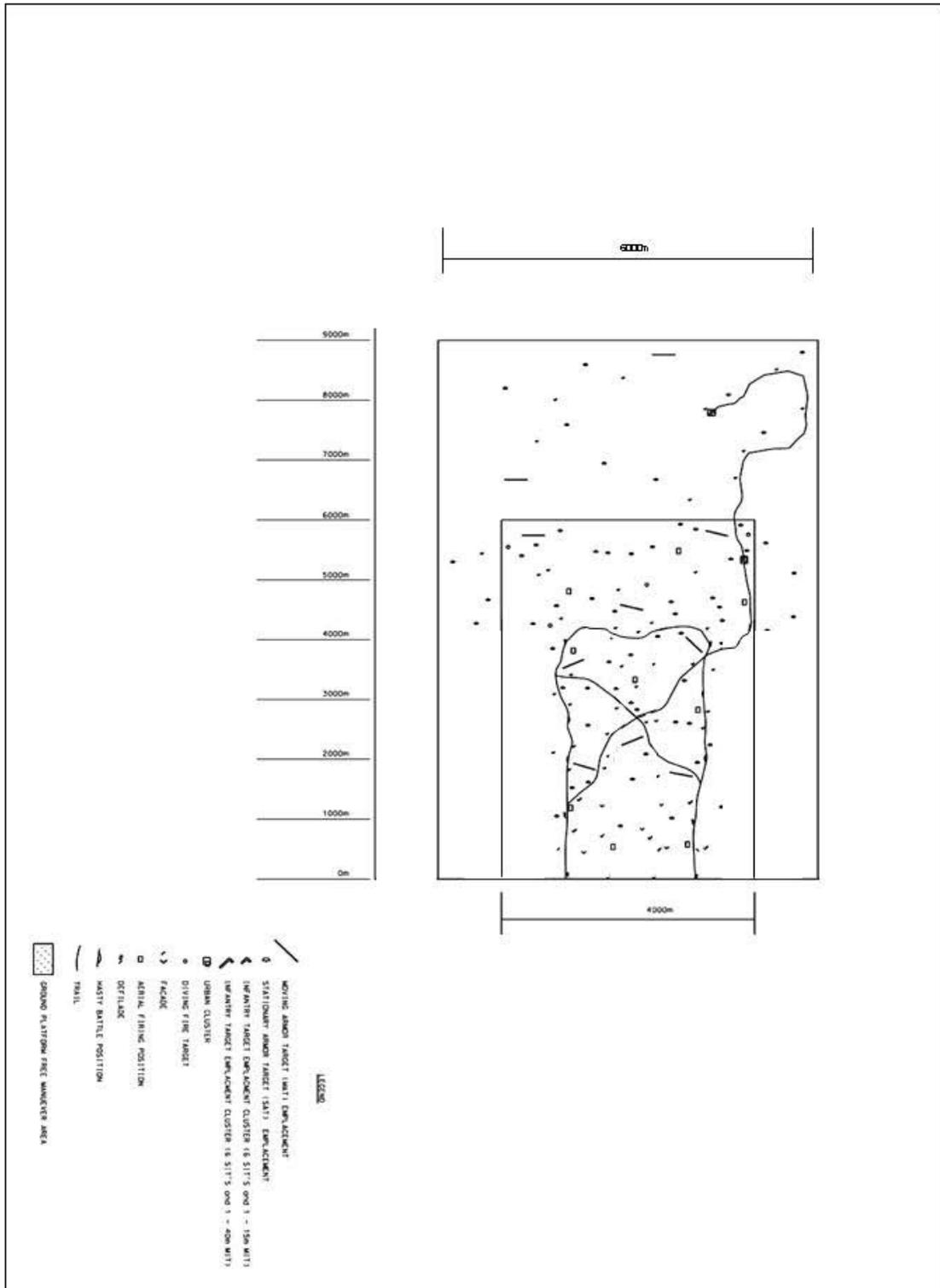


Figure D-40. Aerial Gunnery Range (AGR)

ARMOR RANGE OPERATIONS AND CONTROL AREA FACILITIES (AROCA)

The Instrumented range operations center, Tower and operations/storage building are used to operate and maintain the range. The bleacher enclosure and after action review buildings are used for pre-event and post-event instruction. The remaining buildings are to support the training of the troops.

Associated range operations and control facilities:

Instrumented range operations center, Tower (17971).

Operations/storage building, Large (17122).

Classroom Facility (17123) – TRADOC installations only.

Latrine (73075).

Bleacher enclosure (75061).

Covered mess (17116).

Instrumented Range After action review building (17123).

Ammunition loading dock (14970).

Vehicle Instrumentation Dock (14970).

Unit staging area (85212).

Bivouac area (17720).

Battery building (This building is only provided if all targets are battery operated.).

Additional information: The drawing depicts a typical layout and may be adjusted for project requirements. Minimum set back distances of buildings from the baseline are mandated in AR 385-63, DA Pam 385-63, and DA Pam 385-64.

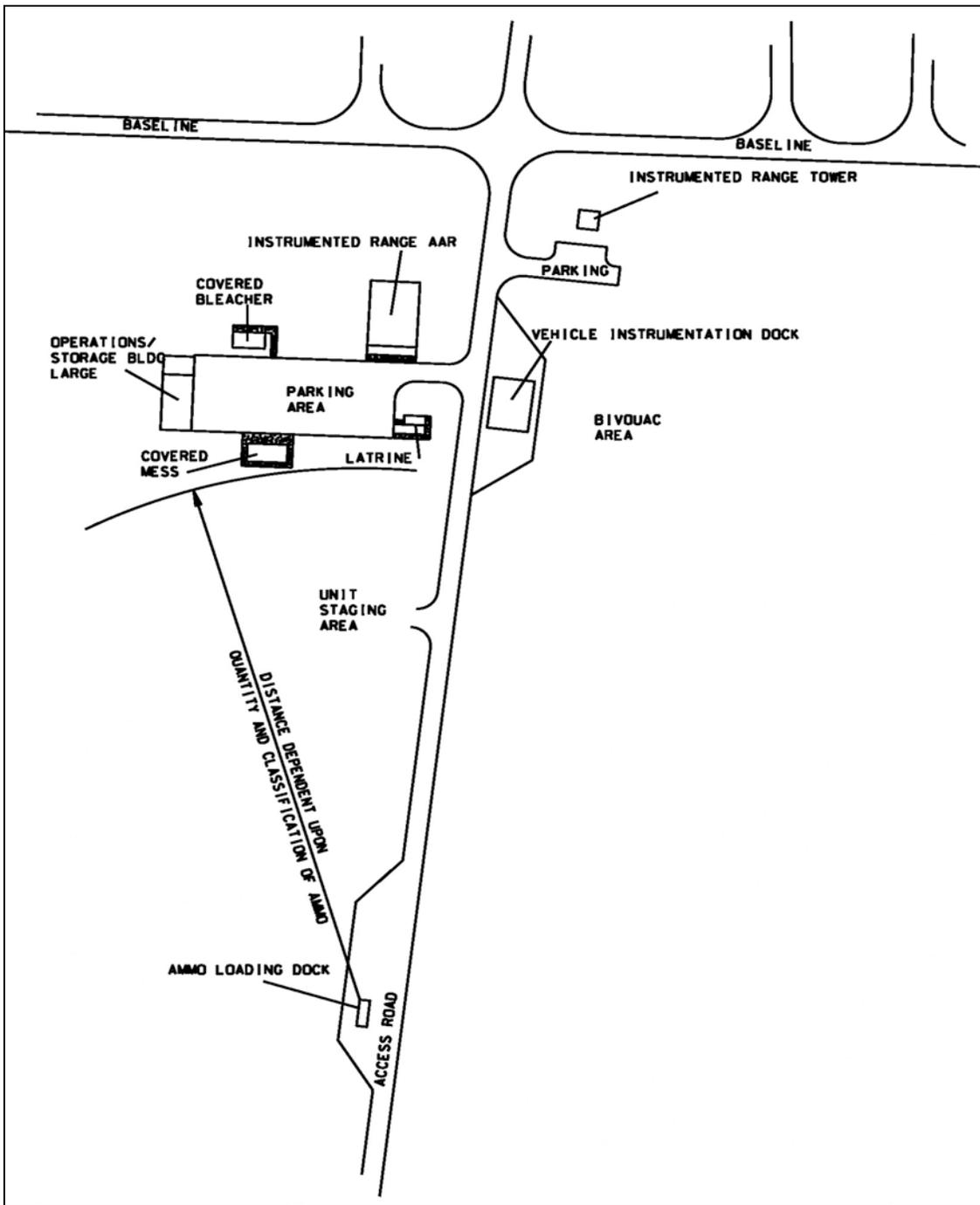


Figure D-41. AROCA facilities

AVIATION RANGE OPERATIONS AND CONTROL AREA (AVROCA) FACILITIES

The Instrumented - range operations center, Tower and Operations/storage building are used to operate and maintain the range. The bleacher enclosure and after action review buildings are used for pre-event and post-event instruction. The remaining buildings are to support the training of the troops.

Associated range operations and control facilities:

- Instrumented - range operations center, Tower (17971).
- Operations storage building, Large (17122).
- Latrine (73075).
- Bleacher enclosure (75061).
- Covered mess (17116).
- Instrumented range, after action review building (17123).
- Bivouac area (17720).
- Unit staging area (85212).
- Ammunition loading dock (14970).
- Vehicle Instrumentation Dock (14970).
- Forward arming and Refueling point (FARP).
- Battery building (This building is only provided if all targets are battery operated.).

Additional information: The drawing depicts a typical layout and may be adjusted for project requirements. Minimum set back distances of building from the baseline are mandated in AR 385-63, DA Pam 385-63, and DA Pam 385-64.

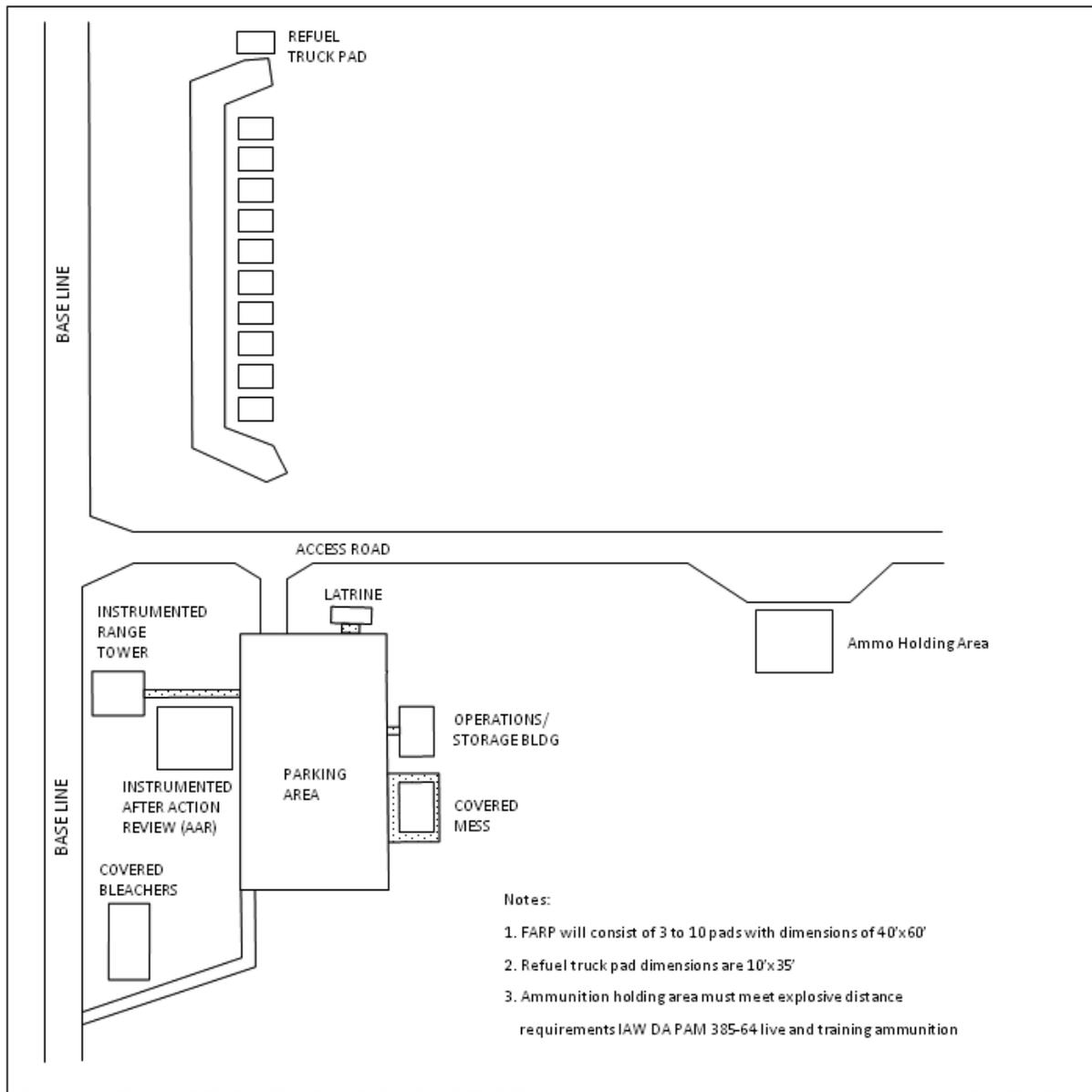


Figure D-42. AVROCA facilities

SMALL ARMS RANGE OPERATIONS AND CONTROL AREA (SAROCA) FACILITIES

The range operations center and operations/storage building are used to operate and maintain the range. The bleacher enclosure and Classroom Facility are used for pre-event and post-event instruction. The remaining buildings are to support the training of the troops being trained.

Associated range operations and control facilities:

- Range operations center, tower (17971).
- Operations/storage building (17122).
- Classroom Facility (17123).
- Latrine (73075).
- Bleacher enclosure (75061).
- Covered mess (17116).
- Ammo breakdown building (17129).

Additional information: The drawing depicts a typical layout and may be adjusted for project requirements. Minimum setback distances of building from the baseline are mandated in AR 385-63, DA Pam 385-63, and DA Pam 385-64.

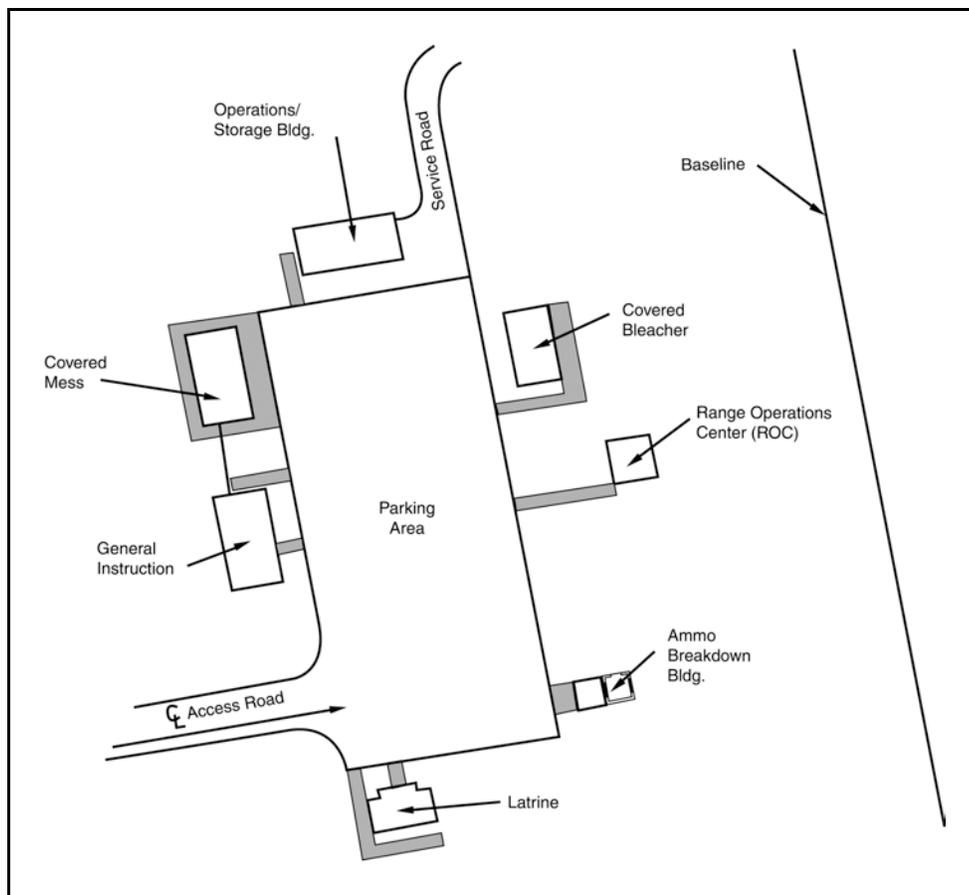


Figure D-43. SAROCA facilities

AVIATION ADD ON PACKAGE

The Aviation Add On Package is a standardized component/infrastructure insertion applied to an existing DMPTR/DMPRC to enable adequate accommodation of specified Aviation live fire training events. Addition of these components, will avoid/preclude unit workarounds to enable effective aviation crew qualification and collective training events. Urban terrain is required to enable diving engagement to specified streets/intersections and engagements in close proximity on adjacent terrain. Additionally, urban terrain will enable critical air-ground integration tactics, techniques, and procedures (TTP) training to ensure the optimum teaming of Army ground and aerial platforms. Components include hardware/software to provide AWSS, AV TESS, and aerial platform data to Range Operation Center (ROC) and After Action Review (AAR) facilities. Aviation FARP, tower, aerial firing points, and diving fire targetry are provided to provide Aviation Commanders with basic infrastructure comparable to that provided for ground platforms (i.e., loading dock, 2-step battle positions, turning pads). Components may be added, as a standardized package, to existing/compatible Instrumented Ranges en lieu of DAGIR construction at installations that quarter/support Light Combat Aviation Brigades (CABs) or smaller units.

Components Include—

4 stationary 3D diving fire targets.

12 Aerial firing points.

1 Air/Ground Integration (AGI) village (13 buildings – mixture of one/two/three story modular construction, non-live fire within the urban area) surrounded by 14 modular structures/stationary targets to enable live fire engagement by Aviation assets.

Convoy Live Fire capability.

Lighted out-front harmonization target for AH64 aircraft.

DMPRC/DMPTR 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 - tower. AWSS scoring data will be captured, compiled and available to the unit during the AAR. ROC-V target image in visual and FLIR spectrum is the objective. Target emplacements must enable protection and resilience from training munitions fired from diving-fire angles of 15-30 degrees as provided in FM 3-04.140 and aircrew training manuals.

Additional ROCA components

Instrumentation requirements: Components and software to enable capture of AWSS scoring data, aerial platform data, and thru-sight recorded video for integration into ROC S/A tools and production of an integrated, effective air-ground AAR product. Aircraft player unit will be capable of supporting force on target (T) and force on force (O) training.

Aviation/Range Control Tower.

10 point FARP (with berm if required)

Additional Information: The range operations center – tower must have the capability to communicate with firing platforms. All stationary/moving infantry targets will be equipped with a muzzle flash simulator. Diving fire targets will provide ROC-V compatible image.