

## 29. FORTIFICATIONS AND BUILDINGS

### Briefing

1. Fortifications and buildings provide concealment for pieces and protection from hostile fire.

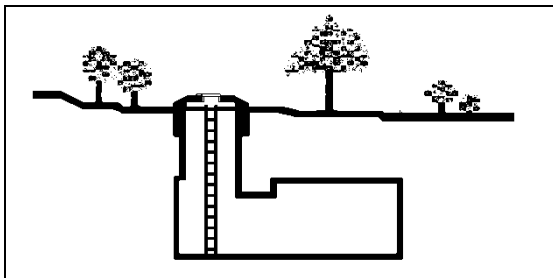
2. Enemy troops in fortifications and buildings may be attacked either by directing the fire against the troops or by penetrating the structure with firepower to hit the troops.

3. **Permanent fortifications** generally consist of bunkers, pillboxes, strongpoints and some weapon emplacements. Permanent fortifications are constructed of reinforced concrete or composite armor. They may also be protected by defense screens or force fields.

4. **Field fortifications** generally consist of foxholes, trench systems and dug-in weapon emplacements, but they may also include pillboxes and bunkers. Field fortifications are usually constructed of earth, sandbags and timber. Field fortifications are built to meet an immediate battlefield need and generally fall into disrepair after the fighting moves on.

5. **Buildings** are civilian structures including houses, sheds, churches, barns, stores, factories, storage tanks, warehouses and many other types of structures. Buildings are more lightly constructed than fortifications and are not designed for defense.

### Fortification types



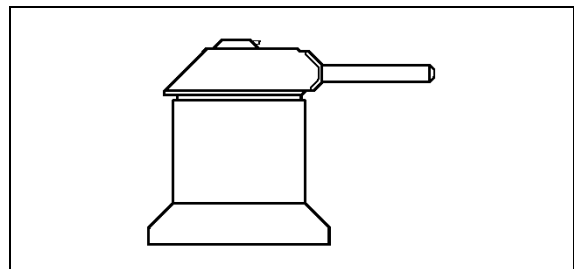
1. **Bunkers** are primarily underground shelters for protection against direct fire weapons and artillery. Bunkers have complete overhead cover

and lack firing slits and embrasures. They are not meant to be fighting positions. Bunkers usually only have one entrance, which may be separate and linked to the bunker by a corridor or tunnel. Some bunkers are built above ground, but these are always heavily armored.

2. **Foxholes** are small holes dug into the ground in which one or two soldiers may shelter from hostile fire. They may have overhead cover of logs or sheet metal with earth and sandbags.



3. **Pillboxes** are structures or covered emplacements for infantry and crew-served weapons, designed so that the defenders may fight from within them. Firing slits and embrasures are provided, and overhead cover is complete. Periscopes and other viewing devices may be provided. Entrances may be above or below ground, and a group of pillboxes may be connected by tunnels.



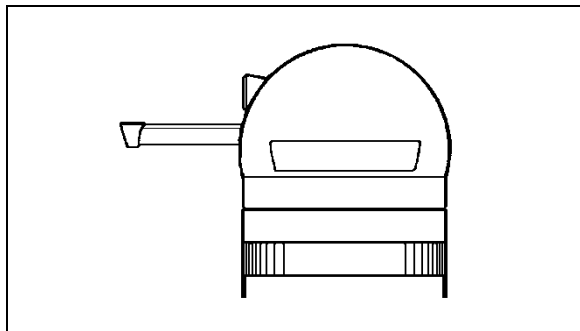
4. **Strongpoints** are armored bastions fitted with powerful weapons and intended to anchor defensive lines or protect key installations. There are many different types of strongpoints. Some are operated by a crew, while others are fully automated. Also known as "infantry fighting positions," some strongpoints provide embrasures and fixed weapon cupolas for infantrymen. Strongpoints are considered to be

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part of the regular forces of stellar nations, unlike other fortifications, which may not be actively manned or automated.

5. **Trenches** are deep, continuous ditches in which troops may shelter from hostile fire. They seldom have overhead cover.

6. **Weapon emplacements** are pits dug into the ground, or embankments of earth or sandbags constructed in order to provide protection and concealment to infantry and crew-served weapons. Overhead cover is sometimes present.



7. **Weapon turrets** are small, armored mounts that usually consist of a fixed pedestal with a rotating turret. The turret usually houses one or more infantry weapons with a field of fire of 360 degrees for maximum effectiveness. Weapon turrets are not strictly fortifications, but are mentioned here for comparison.

### Armor class equivalents

1. The following table gives the armor class equivalents of various types of non-military construction materials used in buildings, walls and fieldworks.

Material/construction	Armor class
brick	6
concrete	7
concrete, reinforced	9
earthen embankment	7
logs	6
sandbags	4
sheet metal	3

Material/construction	Armor class
stone masonry, light	6
stone masonry, medium	7
stone masonry, heavy	8
stucco	3
timber, light	3
timber, medium	4
timber, heavy	5

2. The following table gives the armor class equivalents of various materials and types of roofing construction.

Material/construction	Armor class
concrete, reinforced (with any surface)	9
metal sheeting	4
thatch	1
wood and shingle	3
wood and tile	4

3. The armor classes of the various types of military construction materials are given in Rule 16. Penetration.

### Attacking fortifications and buildings

1. Fortifications and buildings are treated as armored targets, so their reduction is similar in some ways to attacks on armored vehicles and strongpoints. Piercer, hammerhead and nuclear warheads are the most effective projectile weapons to employ. The more powerful energy weapons, such as those mounted on vehicles, are also effective against structures.

2. Attacks on enemy troops within fortifications and buildings are handled as normal direct or indirect fire. The main problem confronting the attacker will be the great amount of concealment a target may have. Nevertheless, the hit/miss determination should proceed normally, giving the target the full benefit of its concealment.

### Destruction

1. War is about destruction, but dealing with

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destruction is one of the most difficult problems to handle in a wargame. In real life several bursts of fire by a 25mm automatic cannon against a corrugated metal shanty will shred and destroy the building. It is not easy to represent this on the wargame table. Probably very few wargamers can remove buildings from the table and replace them with models of damaged buildings. Even if they could, the destruction on the model would probably not match exactly what happened in the battle. Was the building destroyed by a flamer or a bomb? How much of it was left standing? How much will be left after the next turn?

2. **LaserGrenadiers** tries to work around this issue by allowing players to have their forces focus their shooting on enemy pieces based on the amount of the enemy piece that is visible. In addition, the rules allow players to fire at buildings in order to try to catch enemy pieces in the effect areas of their weapons, and even to utilize a form of exploratory fire to try to hit enemy forces that might be there. But these approaches do not capture the simple fact that an RPG impact leaves a large hole that significantly reduces the amount of cover and concealment in a building. In a wargame, the building model carries on with no significant damage, providing an undiminished amount of cover and concealment.

3. Many weapons will cause extensive damage to fortifications and buildings when they hit, weakening the structures by penetrating them or destroying portions of them.

4. Some weapons will have little effect on a fortification or building. As a starting point, players can assume that only weapons that penetrate a structure will actually damage the structure. Only if a weapon penetrates a wall or roof can it leave holes, tear out sections, or demolish portions of a structure. The exception to this is fire, which will be discussed below.

5. No rigid guidelines can be given for the destruction of fortifications and buildings, but

the following general guidelines may be of some help to players.

a. Infantry weapons without effect areas will not cause any damage beyond penetration.

b. Vehicle weapons without effect areas will penetrate the structure and leave a hole. (The players may determine the proper sizes of holes. A hole  $\frac{1}{4}$  inch in diameter for a light cannon is a good starting point for many weapons. The players may designate larger holes for the larger and more powerful weapons, as they see fit.)

c. Vehicle and infantry weapons with effect areas will destroy that portion of a structure covered by the effect area.

d. Nuclear weapons will destroy everything within the warhead's effect area.

6. The optional rule below on creating a point system for building damage provides an alternative system for determining damage.

### Attacking concealed targets

1. Cases will arise where players will desire to attack enemy troops who are firing from within pillboxes, buildings or weapon emplacements but cannot be seen because they have total concealment. It is important to note that even if the enemy troops have total concealment, opposing troops may be able to detect them when they fire, and may also receive a detection bonus depending on the types of weapons the concealed pieces are firing.

**Example:** An enemy soldier in a pillbox fires a bolt rifle at a fireteam and misses. The fireteam members cannot actually see the soldier, but they have a chance to detect where the fire is coming from and return fire. When he fired, the enemy soldier reduced his concealment from *Total* to *More than two-thirds*. His opponents can now detect him on a die roll of 1 to 3. This is increased by +1 due to the signature of the bolt rifle, giving the fireteam a chance to detect on a die roll of 1 to 4.

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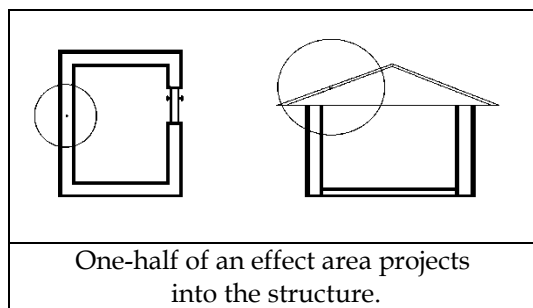
2. Troops may attempt to fire weapons whose warheads have an effect area into the embrasures or doorways of a fortification or building to attack the enemy troops within the defenses.

a. In order to perform hit/miss determination, target sizes must be assigned to the embrasures, windows and doorways.

b. The firing player should state where in the fortification or building he wants to center the effect area. The point chosen must be in the line of fire, that is, it cannot be a point that would be impossible to hit.

3. Attacks may be made against a fortification or building in an attempt to penetrate it and hit enemy troops in **known** locations within. If the attack succeeds in penetrating the structure, the players should then determine if the attack hits the troops within.

a. When weapons with an effect area penetrate a fortification or building, one-half of the effect area will project into the structure. This represents the combined effects of blast, shrapnel, concussion and debris. All enemy troops within the effect area are considered to be hit.



b. Single shot and beam weapons will have a 30% chance to hit an enemy piece within a fortification or building.

c. Automatic and pulse weapons will have a 40% chance to hit an enemy piece within a fortification or building.

d. Rotary automatic weapons will have a 50% chance to hit an enemy piece within a fortification or building.

4. Exploratory attacks may be made against a fortification or building in an attempt to penetrate it and hit enemy troops in **possible** locations within. The attacking player must designate a specific target area of the fortification or building. If the attack succeeds in penetrating the structure, the players should then determine if the attack hits any troops within.

**Note:** An exploratory attack is meant to represent a situation where a piece fires at a fortification or building with no idea if enemy pieces are present or where they might be located. That is why the chances to hit enemy pieces are so low.

a. When weapons with an effect area penetrate a fortification or building, one-half of the effect area will project into the structure. All enemy troops within the effect area are considered to be hit.

b. Single shot and beam weapons will have a 10% chance to hit an enemy piece within a fortification or building.

c. Automatic and pulse weapons will have a 20% chance to hit an enemy piece within a fortification or building.

d. Rotary automatic weapons will have a 30% chance to hit an enemy piece within a fortification or building.

### Combat engineers and buildings

1. Combat engineering can include such actions as breaching the walls of buildings. In addition to demolitions, engineers and armored engineering vehicles may use chainsaws and buzzsaws to perform this work.

2. The players should assign damage points to the target and determine the number of successful attacks required to breach the target.

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**Example:** The players may determine that three successful attacks are required to breach a brick wall.

3. A successful attack is one that both hits and penetrates the target. Each successful attack counts as one hit, causing one point of damage.

**Example:** A wardrone equipped with a chainsaw attempts to breach a brick wall that can take three points of damage. In the first and second turns the wardrone hits the wall and penetrates it, causing one point of damage each turn. The wardrone fails to penetrate the wall in the third turn. In the fourth turn the wardrone hits the wall and penetrates it. The wall is breached.

4. The optional rule below on creating a point system for building damage provides an alternative system for determining damage.

### Representing building damage on the wargame table

1. To represent the damage done to structures, the players should determine an acceptable way to indicate the amount of destruction that has been suffered.

2. Since it is undesirable to damage or destroy model buildings and fortifications, the players may mark these with tape, chalk or construction paper to indicate the damage done. This requires the players to try to visualize this damage when performing detection and hit/miss determinations.

3. Since it is difficult to represent destruction, the players may choose to ignore the damage done to structures. While this offers less battlefield realism, it removes the need to establish complicated damage-marking procedures, and allows the players to concentrate their efforts on hitting the enemy forces.

### Creating a point system for building damage - (Optional rule)

1. One option is to assign points to a structure and keep track of the points lost as the battle proceeds. There are various ways to determine how a structure takes damage points.

Variant	Description
1	A penetrating hit causes one point of damage. For example, a penetration by a heavy fusion rifle would cause 1 point of damage. This variant is the simplest, but all weapons have an equal effect.
2	A hit causes one point of damage, but a penetrating hit causes damage equal to the attack factor of the weapon. For example, a hit by a heavy fusion rifle would cause 1 point of damage. A penetration by a heavy fusion rifle would cause 7 points of damage. (Based on the attack factor of 7.) This variant gives greater weight to penetrating hits and the power of the weapons.
3	A hit causes one point of damage, but a penetrating hit causes damage equal to the attack factor of the weapon. The damage is doubled if the weapon has an effect area. For example, a hit by a heavy fusion rifle would cause 2 points of damage. (One point for the hit, which is doubled because the weapon has an effect area.) A penetration by a heavy fusion rifle would cause 14 points of damage. (The attack factor of 7 is doubled.) This variant emphasizes the destruction caused by weapons with effect areas.

2. The points assigned to buildings must be scaled to the damage variant used. Assigning 24 points to a building may be appropriate if Variant 3 is used, but will make a building incredibly resistant if variant 1 is used.

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3. An additional option that can be used with all damage variants is to check the overall percentage of damage a structure has taken and check at the beginning of each turn to determine if the structure collapses. This represents the fact that damage can weaken the structural integrity of a building and cause its collapse before all of its "points" have been expended. For example, if a building has taken 40% damage, it will collapse unless a 1 to 6 is rolled on a ten-sided die.

4. When a structure is considered to be destroyed the players can simply classify the position as untenable and not allow any troops to move through it or occupy it.

5. Some model buildings developed for wargaming have sections that can be removed to simulate damage and destruction. Players will need to determine how many points of damage it takes to remove each section.

### Fires – Optional rule

1. Upon striking the walls or roofs of fortifications and buildings, some weapons may cause fires, even if they do not penetrate the structure. These weapons may also destroy trees, hedges and other types of vegetation when they strike them.

2. The following weapons may cause fires when they strike surfaces that contain or are composed of wood, thatch, vegetation, or other flammable materials such as fabrics and plastics. The table gives the number range needed on a ten-sided die to cause a fire.

Weapon type	Die roll to cause a fire
Blast	1 to 9
Blazer	1 to 10
Bolt	1 to 8
Conversion beam	1 to 8
Distortion beam	1 to 7
Flamer	1 to 10
Flamethrower	1 to 10
Fusion	1 to 9

Weapon type	Die roll to cause a fire
Hammerhead	1 to 8
Hellburner	1 to 10
Hellfire	1 to 10
High explosive	1 to 6
Laser	1 to 8
Nuclear	1 to 10
Particle beam	1 to 7
Phaser	1 to 9
Piercer	1 to 7
Plasma	1 to 9
Vaporshock	1 to 9

3. Rain and damp weather (such as mist) decrease the chance that a fire will start. Subtract the following factors from the die roll to cause a fire.

Condition	Effect on die roll
Mist	-2
Rain	-4

4. For convenience, the players can assume that a fire will double in size every second turn as long as there is sufficient fuel (the affected building or vegetation). This is a simple calculation and keeps the players from spending too much time on a minor rule procedure.

a. For very strong wind conditions the players can assume that fires triple in volume every second turn.

b. Players may alter these guidelines as they desire.

5. Fire will have an attack factor of 5 for troops and vehicles that are caught in burning areas or attempt to pass through a burning area.