Surface Danger Zones (SDZs)

A Practical Guide for Civilian Ranges & Clubs

What Is a Surface Danger Zone (SDZ)?

A Surface Danger Zone, or SDZ, is a calculated area that shows where a projectile can travel when fired from a specific location, using a specific weapon and caliber. It accounts for direct fire, ricochets, and worst-case trajectories based on real-world ballistics. In simple terms, an SDZ answers one critical question: If a round leaves the muzzle here, where could it end up? SDZs are the standard used on military training ranges worldwide to ensure rounds remain contained within controlled areas. When properly applied, they replace assumptions with documented certainty.

Why Berms Alone Are Not Enough

Many civilian ranges rely primarily on berms for safety. Berms are important, but they are not the whole picture. Berms can erode, settle, or be altered over time. Shooters may fire from positions or angles that were not originally planned. Different calibers behave very differently once they leave the muzzle, especially when ricochets or elevated firing angles are involved. An SDZ looks beyond the berm and evaluates the entire area where a round could realistically travel.

What an SDZ Accounts For

A properly developed SDZ considers weapon and caliber characteristics, maximum projectile range, ricochet behavior, firing point location and height, terrain and elevation changes, and property boundaries. Each caliber has a unique SDZ and must be evaluated independently.

Why SDZs Matter for Civilian Ranges

SDZs provide defensible safety planning, clear documentation for insurance providers, confidence for range boards and ownership, and objective justification for range layouts and restrictions.

Common Misconceptions About SDZs

Past success does not replace documented analysis. Berm height alone is an assumption without modeling. SDZ methodology applies to all live-fire environments, not just the military. One SDZ does not cover all calibers.

When an SDZ Should Be Reviewed

SDZs should be reviewed when new calibers are introduced, firing points change, berms are modified, land use changes nearby, or range usage increases significantly.

Final Thought

Most range incidents are not caused by negligence. They are caused by assumptions that were never revisited. A properly developed SDZ replaces assumptions with documented, defensible decisions.

Prepared by Range Operations

Military Precision. Civilian Solutions.