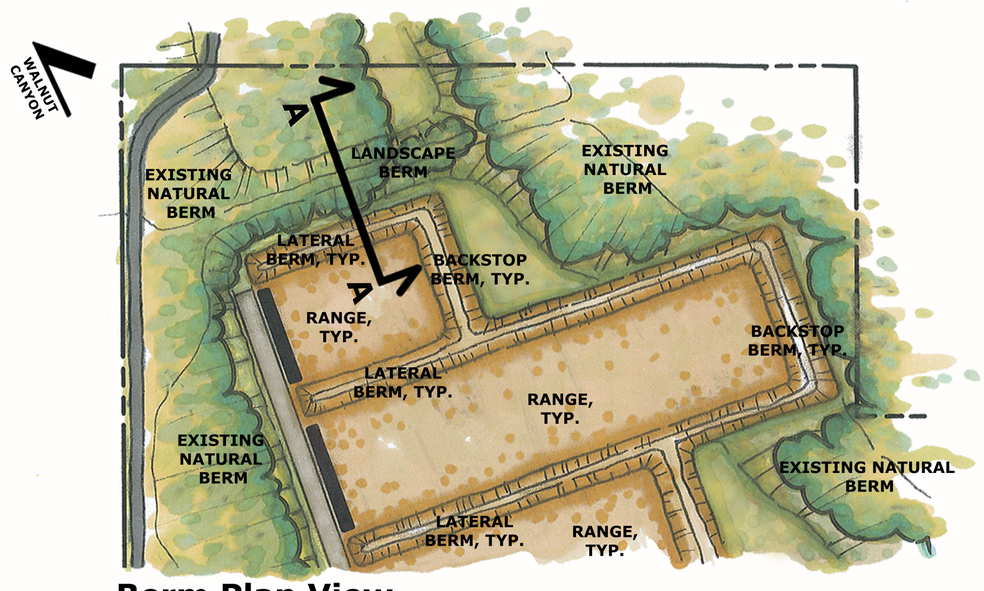
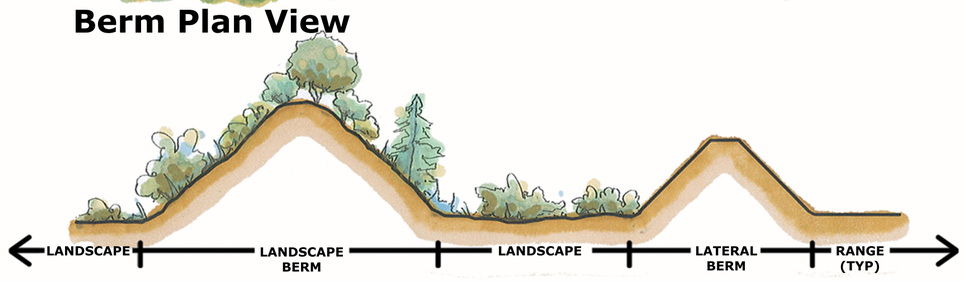
Potential Sound Mitigation Strategies
for Northern Arizona Shooting Range

Typical range construction includes components that mitigate sound. These components include earthen berms, back-stops, shooting canopies, and the natural landscape. In addition to these typical range components, Arizona Game and Fish Department is looking at the latest technologies in sound mitigation to build this state-of-the-art shooting range.



Berm Plan View



Berm Cross Section A-A

1. STANDARD RANGE BERMS

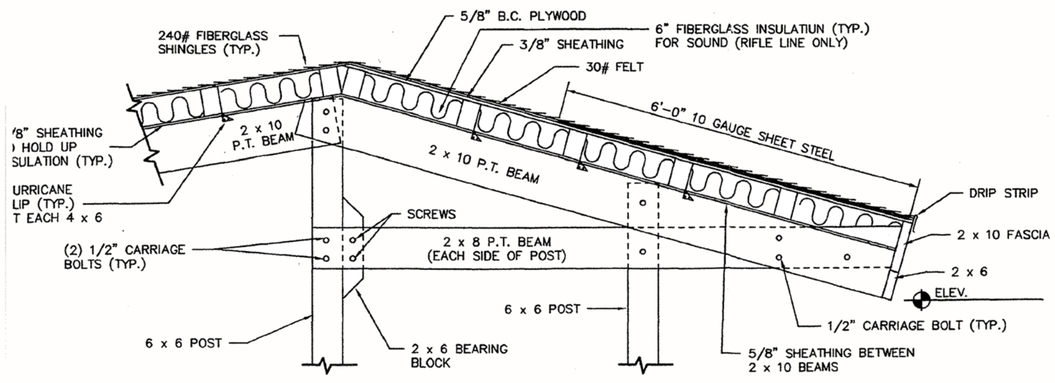
Typical shooting range design and construction includes lateral and backstop berms. See Berm Plan View and Berm Cross Section A-A.

These berms naturally restrict sound travel and reduce sound levels.

2. LANDSCAPED BERMS

Strategically placed landscaped berms with vegetation can reduce the sound levels as well as interfere with sound travel.

Landscape berms could be placed parallel with and adjacent to shooting range lateral berms to mitigate sound. See Berm Plan Vew and Cross Section A-A. Landscaped berms can also be placed on the north and west sides of the property to interfere with sound traveling off the property. Both strategies further reduce sound levels and restrict sound travel.



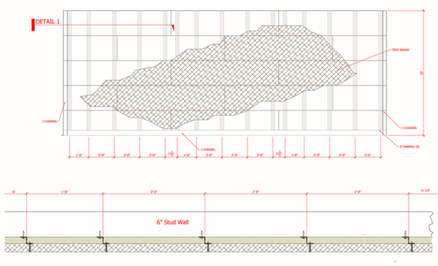
Insulated Roof Detail

3. INSULATED FIRING LINE ROOF

Insulation applied to a roof placed over the firing line helps reduce the sound from being projected forward from the firing area by absorbing the sound energy instead of reflecting it.

Typical material may include blown in insulation, batting, or fiberglass insulation applied to a wood roof structure. See Insulated Roof Detail. This material can also be applied to walls for additional sound mitigation.

NOTE: Metal is a resonating material and should not be used to decrease sound reflection.

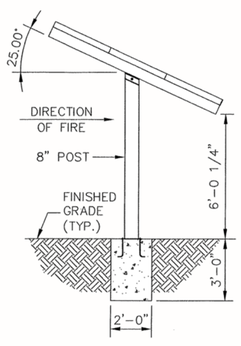


Troy Acoustics' Troy Wood and Troy Board Application Detail

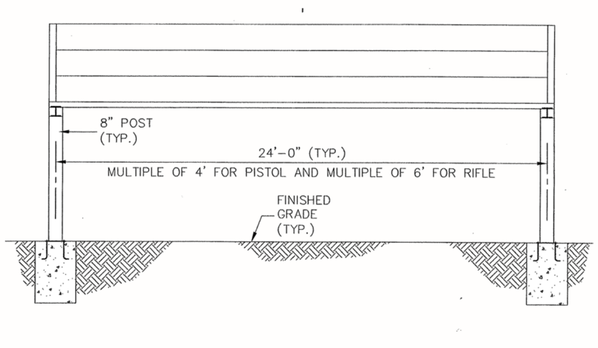
4. SUPPLEMENTAL MATERIAL FOR BACKSTOP AND LATERAL BERMS

Sound absorbing material can be applied to a range back-stop and lateral walls for environmental sound control.

Troy Acoustics Corporation has developed a system that is specifically used for shooting ranges to mitigate sound. Their system has been extremely successful in reducing sound levels. In a typical application Troy Wool and Troy Boards are applied directly to the wall material. See Troy Acoustics' Troy Wood and Troy Board Application Detail.



Baffle Section



Baffle Elevation

5. BAFFLES

Baffles are common for use in reducing bullet ricochet but they can also aid in sound reduction and deflection.

Baffles consist of an overhead roof angled at 25 degrees towards the direction of fire. These structures can be set in concrete or mobile. See Baffle Section and Baffle Elevation.

NOTE:

THE ARIZONA GAME AND FISH DEPARTMENT IS COMMITTED TO INCORPORATING COST EFFECTIVE MEASURES WHEN CONSIDERING SPECIFIC SOUND MITIGATION STRATEGIES APART FROM THE INHERENT DESIGN COMPONENTS OF THE RANGE. THE PROCEDURES OUTLINED ABOVE PROVIDE POSSIBLE AVENUES FOR SOUND MITIGATION. THE DEPARTMENT WILL COMPLY WITH ALL EXISTING LAWS AND WILL DO WHAT IT CAN TO BE A GOOD NEIGHBOR.