Lead or alternative materials on shooting ranges? Examples from real life.

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Overview (Tour de force!)

- Shooting ranges have to follow stringend regulations on safety and environmantal protection (but are normally managed by „amateurs“)
- Construction of clay pigeon ranges
  - Earth walls (berms)
  - Containersolutions
  - Nets
  - Wooden constructions
  - Recycling without minimizing the shot fall zone
- Noise mitigation
- Air pollution control
- Lead free bullets
- Aim: Show the complexity of the problems on shooting ranges (one try, two aims!)

Berms or Earth Walls

- Two examples
  - Garlstorf
    - Costs: 1.2 million Euro (160.000 m^3 of soil moved!)
    - Berm up to 23 m
  - Oberg
    - Costs: (trap and skeet): 300.000 €

- Until today approx. 40 clay pigeon ranges were reconstructed with earth walls


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08/09/2005

Berms

- Advantages
  - Low maintenance costs
  - Sound attenuation (distances < 900 m)
- Disadvantages
  - High space requirement (for the berm)
  - Collection of shot relatively costly
- For the „average“ shooting range operator a sensible solution

Containersolution

- Shooting Range Liebenau
  - Costs for the reconstruction incl. remediation of PAH and shot:
  - approx. 900.000 €

Containersolution

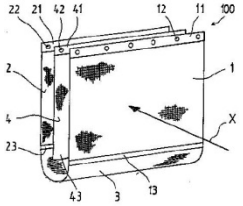
- Advantages
  - Distance shooter to container is shorter in comparison to berms (vertical obstacle, lower space requirements)
  - Easy recollection of shot
- Disadvanteges
  - Relativelly costly
- Unclear
  - Noise (advantages and disadvantages - reflections)
  - Costs for maintenance – on the long term
- One range up to now.

Nets

Shot-Net (internat. patented system)

Pforzheim

Quelle: SG Pforzheim



Single module

Shot collected in the net

Nets

- Advantages
  - Distance shooter to net is shorter in comparison to berms
    (vertical obstacle, little space requirements)
  - Easy recollection of shot
- Disadvantages
  - Relativelly costly
  - Not able to operate when windy
- Unclear
  - Long term sustainability of the net
- Used on three ranges until today

Wooden Berms (Parchim)

Wooden Walls (Parchim)

- Advantages
  - Low costs, little space requirements
  - Easy recollection of shot
- Disadvantages
  - Minimized angles and heights
- Sole training area

All the above presented solution

- Follow the principle of „minimizing the shot fall zone“

New approach:

- Waakhausen, Hartenholm
  - „Let the shot fly and collect it on the surface“.

Hartenholm (Schleswig-Holstein)

Trap- and skeet range – Net on the surface approx. 35.000 m²

Build: 2007

- Disadvantages
  - Space requirement – 3.5 to 10 ha
  - Sensitive to damage by food steps (game)
- Unclear
  - Maintenance costs?
- Used on three ranges until today

Recycling - an Example

Lead Recycling

- Recollection of shot = mandatory by the Cycle Economy Act (Germany)
- Especially important for clay pigeon ranges
- Seperation of the several ingredients of recollected material before depositing = mandatory
- Important for rifle ranges as well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Lead recycling

- Example „Berlin Wannsee“
  - 2005 – 20 m back stops of rifle lanes
    - Remediation costed 56.000 €
  - 2007 – 100 m back stops of rifle lanes
    - Profit (positive result) = 4000 €
  - Gain per ton of shot pellets
    - Approx. 1200 € (day price)
  - Recycling of steel? No return!

„Lead free“ alternatives

- Steel? (the only „alternative“ in the eyes of the German authorities)
  - Contains up to 3 % of heavy metals like nickel or cadmium
  - These are fully bioavailable in 12 to 15 month
  - Has not the performance of lead (weight).

Noise – Noise mitigation

Noise is still the biggest „killer“ for shooting ranges

- Example DEVA Range in Berlin-Wannsee


B1
Stahnsdorfer Damm
Bismarckstraße
Wannsee
N
W
E
S
Image © 2006 GeoContent
Google


Hall 2
Hall 1
Image © 2007 AeroWest
© 2007 Europa Technologies
79 m
Google

Noise mitigation

- Costs of reconstruction – considerable!
  - 100 m range (3 lanes) in Berlin approx. 230.000 €
  - But without noise mitigation:
    - Allowance for 270 shots per day
  - After reconstruction = 27.000 shots allowed per day!
  - Immission on the neighbourhood is always lower than 50 dB(A)!

Air conditioning on partly covered shooting ranges

- Costs for „normal“ airconditioning on shooting ranges > 100.000 €
- Costs for 3 shooting lanes shown above = 13.000 €

- Experiences with lead free bullets made on shooting ranges in Germany

Safety berms with rebound protection on a 100m-range, constructed following the „Schießstandrichtlinien“

Damage caused by
lead bullets (rebound protection removed)

Especially endangered: the lower part of the construstion.

Rust will weaken the statics! (lead-free bullets!)

4. Berm of a 100 m lane, 4 years in use without any damage, 1 year of lead free bullets

Test on behalf of BVS

- Lead free bullets on concrete safety wall
- 3 Shots!!
- Wall is broken (red arrow)
- Rebound protection was removed by the last shot

Consequence:

All shooting ranges allowing the use of lead free bullets have to improve the rebound protection and protect the installations on the shooting range!

Conclusions

- Shooting range operators invest a lot of efforts and money in beeing „environmentally friendly“
- Shooting range operators always have to look on all the existing problems, not only one aspect

Thank you very much for your patience