MOBILE GUN POSITIONS

Bruce Allen

ABSTRACT

This paper discusses the mobile gun position system used by the British Columbia Ministry of Transportation and Highways in their avalanche control program. The benefits of the system, its basic components, set-up sequence and costs are addressed. The system has been found to be a convenient, efficient and effective method of controlling avalanches.

THE MOBILE GUN POSITION SYSTEM

In the spring of 1987 a decision was made by the British Columbia Ministry of Transportation and Highways to substantially expand their avalanche control program within the province. Terry Wilton, Mechanical Foreman, and Ed Campbell, District Avalanche Technician, of Hope, B.C., were asked to design and develop a system that would meet the needs of this expanded program. The Mobile Gun Position system is the result. The benefits of the mobile gun position system when compared to fixed gun positions or other mobile systems are numerous and varied.

BENEFITS OF THE SYSTEM

Reduced Costs

The design and development of standard sized components enables mass production and volume purchasing. The majority of the in-ground or fixed units are of precast concrete, a material known for its excellent construction characteristics and relative low cost. The other parts of the fixed units can be easily made, en mass, by any machine shop.

By having one mobile weapon, multiple avalanche areas can be controlled without the need for multiple stationary weapons. The use of a gun trailer eliminates the need for a truck dedicated solely to avalanche control.

Levelling

The ability to level the platform is essential to the use of the 105 and increases the accuracy of the avalauncher during blind firing.

Adaptability

Both the 105 recoiless rifle or the avalauncher can be fired from the same in-ground unit with no change necessary to that unit. If an avalanche projectile is developed for the G.Q. Launcher the system can readily accommodate that weapon.

Adjustability

Should the gunsite settle unevenly for any reason approximately 3 inches of vertical and 1.5 inches of horizontal adjustment is available in the in-ground units. This allows for ease of relevelling and realigning the gunsites.

Ease of Installation

The in-ground portion of the system can be easily installed in less than a day. The only skilled labour needed is a backhoe operator; the only major equipment, a backhoe. This also reduces costs.

Ease of Removal and Reuse

Should operational concerns such as highway realignment or construction of defenses eliminate the necessity of a gunsite the in-ground components can be quickly and easily removed and reused elsewhere in the district or province.

Gun Maintenance

As the gun is mobile it can be wheeled into a shop allowing servicing in a warm and productive setting.

In-ground or Fixed Units

There are four fixed units at each gunsite. Each of these units is made up of five parts. The five parts are: the foundation slabs with locating studs; anchor posts with adjustable locating cones and lock nut; protective concrete cylinder; drain pipes for the cylinders; and steel lids.

The four units of the in-ground component of the system are exactly located, in relation to each other, by the use of an aluminum jig. The spacing of the units, with relation to each other, ensures that the levelling jacks on the trailer will sit exactly on the locating cones of the anchor posts.

Trailer

The trailer component consists of the basic trailer, four levelling jacks, and four levelling cables. If the trailer carries an avalauncher it will have a nitrogen housing, gauges, gun cover, barrel case and barrel case cradle. The 105 trailer lacks the gas accessories but has wheels on the front and back, for side ways manoeuvering, and electric hydraulic jacks.

Gun

The gun used with this system can be either the 105 recoiless rifle, the avalauncher or possibly, in the future, the G.Q. Launcher.

Truck

The vehicle presently preferred by the Snow Avalanche Section is a three quarter ton 4 x 4 pickup. A canopy is mounted on the back of the pickup and a workshop built inside the canopy. Assembly of projectiles or other necessary duties can therefore be performed out of the weather. Explosives are also transported in this workshop.

SET-UP SEQUENCE

1) The truck and trailer are lined up in front of the in-ground units.

2) The trailer is positioned over the lids.

3) The lids are removed to expose the anchor posts.

4) The trailer is manoeuvered into position so that the levelling jacks are directly over the anchor posts.

5) The levelling jacks are lowered onto the locating cones of the anchor posts.

6) The levelling cables are connected to the anchor posts.

7) The trailer is jacked up until the cables become taut.

8) The gun cover is unlocked and lifted off the gun.

The gun platform is now ready. Ten minutes or less have elapsed since the set-up sequence began. The set-up sequence varies at this point depending on the weapon. If it is the 105 then shoot preparation begins. If it is the avalauncher then...

9) The barrel is taken from the barrel case and slid into the gun's

barrel tray.
10) The safety and firing levers are checked to assure their proper position.

11) The gauge cover is unlocked and opened. The gauges are checked.

12) The nitrogen cylinders are cracked and the supply lines are connected.

The avalauncher is now ready for test firing. Fifteen minutes has elasped since set-up began. During this set-up time the sweep of the highway would occur simultaneously. Once that sweep has been completed the projectiles are armed and firing commences.

COSTS

The cost of the in-ground components installed, (including shipping, labour, flagging, paving and machine rental), is approximately 3500 dollars.

The cost of the newest trailer complete is 4750 dollars.

The cost of the truck varies depending on needs and budgetary concerns.

The cost of the gun varies depending on the weapon, where and how it is purchased.

CONCLUSION

The British Columbia Ministry of Transportation and Highways has found this mobile gun position system to be a reasonably priced convenient, efficient and effective method of controlling avalanches that threaten their highways.