

POSSIBLE DAMAGE TO SCENERY (cont'd):

if yes even improve the view of the Iron Gates as they are approached from the east. Plate 6 shows the site of the tunnel entrance in its present natural state. The lower right half of this picture shows waste material dumped from the road above. The upper left hand part pictures the limestone breccia with its natural forest cover. This need not be damaged beyond the limits of the tunnel entrance and any accidental damage to the vegetation would soon be repaired by natural growth.

There is a possibility that in blasting the first few rounds in the tunnel a few thin slabs of rock 1 to 3 feet in length might be released from the canyon face directly opposite these blasts. These are slabs that have already been loosened by natural causes and which sooner or later will fall of their own accord. Two of them are shown on plate 5. Their removal would not appreciably alter the appearance of the canyon.

Much can be done to reduce the blast vibrations by the use of short period delay detonating caps, by limiting the size of individual charges and controlling the number, length and spacing of the drill holes. Still further reduction of shock waves can be achieved by using, in the peripheral parts of the tunnel and especially the south side, the Swedish method known as "smooth blasting." This consists in using closely spaced drill holes (1 - 3 foot centres) along the design lines of the tunnel and loading every second or third hole with long thin cartridges having a diameter considerably less than that of the holes. This provides an air cushion between the blast and the rock. Besides reducing the earth vibrations it results in a smooth surface with little or no overbreak. Considering the high value placed on the scenery and the hot springs of this area it is suggested that the above blasting precautions be incorporated in the specifications and that the design of the blasts and their supervision be entrusted to an experienced expert.

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