

Security is an art on itself

Introduction

A museum for modern art will organize a big exhibition with pieces of a number of great artists in the field of modern art. The organization is busy with preparations for the exposition, and they meet with difficulties concerning security.

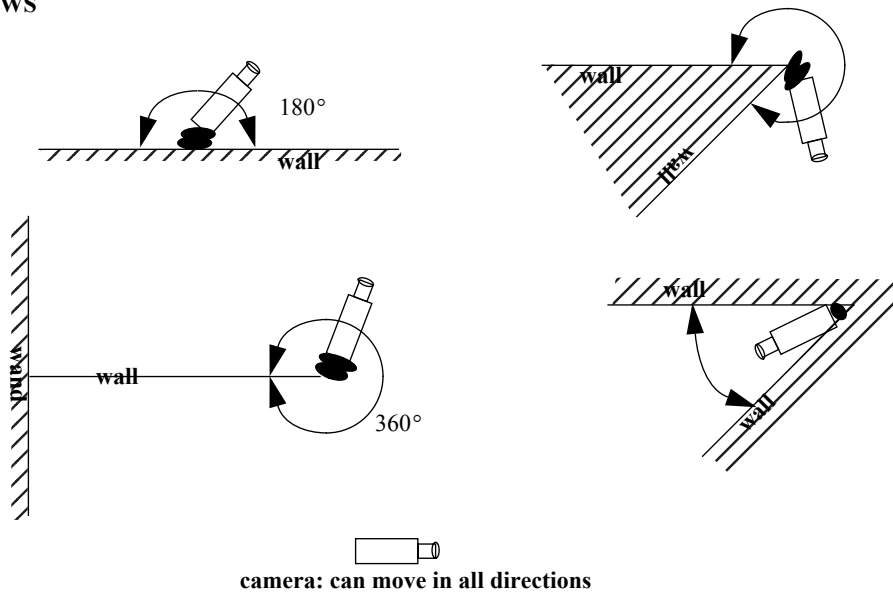
A new security system

The present security system with video cameras doesn't satisfy the demands of an exhibition this size. The cameras aren't movable enough (to show another corner), but the main objection is, that the present system cannot cover the complete space in the museum. To organize the exposition, it's necessary to get a new security system.

The new type of camera that will be used, is already chosen. This camera is so fast in moving (in all directions) and focussing, that one can say that this camera really secures the complete surrounding space (see the figure below).

All walls in the museum go from floor to ceiling.

TOPVIEWS



A disadvantage of this camera is its high price. That's why it's necessary to investigate carefully where the cameras should be placed, for you want the least possible amount of cameras.

Enclosed is a map of the museum. The museum has a triangular formed topview. The grey part contains the entrance, bathrooms, cloakroom and office rooms. It's not necessary to replace the old cameras in this part. The new security system is just needed for the part that is not grey.

Question 1

Think of a placement of cameras, in such a way that you use the smallest possible amount of cameras to secure the exhibition room.

Describe the system you used to come to this placement of cameras.

Mark where the cameras should be placed and show that the whole exhibition room will be secured this way.

The exhibition contains a little less than 100 paintings. To show these paintings in a proper way (with enough space in between), at least 280 meters of wall capacity is needed, but: the more wall capacity, the better.

On the map, you can see a number of bold walls. These are carrying walls; the other walls can be removed.

Because the new security system is very expensive, the organization wants to reduce the expenses. To do this, there is the possibility to reduce the number of cameras, but there is also the possibility to remove non-carrying walls. Removal of wall costs f500,- per meter. A video camera costs f10.000,- each.

Question 2

How is it possible through removing walls (keep the minimum amounts of capacity you need in mind!), to save expenses on the cameras? In other words: how is it possible, by removing as little wall capacity as possible, to make as many cameras as possible superfluous? And yet, all walls stay secured?

Make a proposal and calculate the savings that this solution will give you.

After this exhibition, the inside of the museum will be changed drastically. First, all non-carrying walls will be removed and just the carrying walls will stay.

Because the new inside of the museum will be used for a longer period of time, and for several more exhibitions, an architect agency will be hired to create the new inside. The assignment will be to add 150 meters of wall capacity to the existing carrying walls. Furthermore, 6 cameras must be sufficient for security, yet, there must be an attractive partition of space.

Question 3

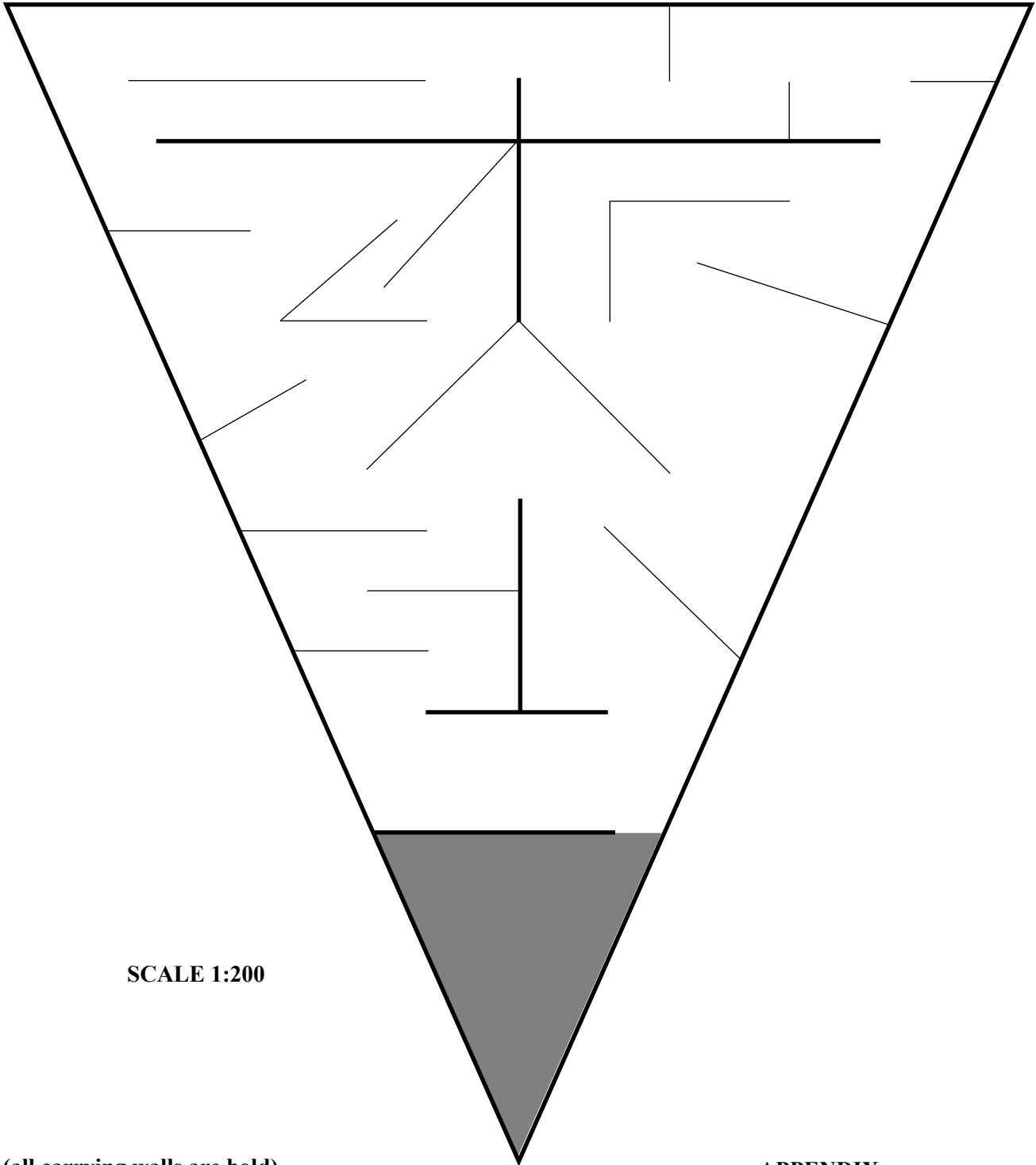
A number of architect agencies is being asked to hand in proposals in which the conditions are met.

Your team works for one of the architect agencies, and your agency really wants the assignment. Of course you won't be a strong rival if you just meet the minimum demands.

Make a proposal for the museum board (including working drawing and short 'covering letter').

THE END

MUSEUM MAP



SCALE 1:200

(all carrying walls are bold)

APPENDIX