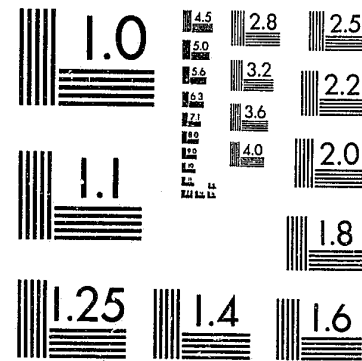


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National Institute of Justice
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Director William H. Webster's message concerns the problem of arson. Photo by William A. Gangloff, Fire Inspector, Washington, D.C., Fire Department.

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FACILITIES

FIREARMS TRAINING RANGE: A Practical

Construction Guide

By

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"Recognizing the rising popularity of target shooting as a sport among many citizens, together with the realization that the local area needed facilities where its law enforcement personnel could polish their firearms skills, the concept of a pistol and rifle range for citizen and police use was conceived. . . ."

Can a law enforcement agency provide a firearms range, a recreation site, a public relations triumph, a response to court decisions—all of these things and more in one complex? The Division of Police of Henrico County, Va., has accomplished just that.

Recognizing the rising popularity of target shooting as a sport among many citizens, together with the realization that the local area needed facilities where its law enforcement personnel could polish their firearms skills, the concept of a pistol and rifle range for citizen and police use was conceived in the late sixties.

The police administration received many inquiries from citizens seeking information as to where one could shoot, sight in, and practice his sport in a safe, fun environment. The need for such a facility had been evident in the county for a number of years.

Moreover, two other important factors suggested the administration examine the feasibility of constructing an independent range facility. The first factor was that the range which had been used in prior years belonged to a local pistol club and had been sold for residential development. The second centered on the moral and legal obligations of a governmental unit to assure proper training for its law enforcement personnel in the "safe use and proper handling" of firearms.

Municipal Liability

The extent of liability is graphically portrayed in the well-known New Jer-

sey case involving a sizeable civil award to an injured citizen because of wrongful injury inflicted by a police officer.¹ The facts of the case were:

"Thomas was appointed a police officer by the city in December of 1956. On a day in April 1958, he was off duty and dressed in civilian clothes. During the afternoon he spent about 3 hours in a tavern consuming 5 or 6 bottles of beer. Then, returning to his apartment about 8 p.m., he removed his overcoat and commenced to take his revolver from its holster, preparatory to using the bathroom. At the time, he wore an off-duty holster attached to the left side of a belt which supported his trousers. He took the gun, a loaded cal. .38 police service revolver, from this holster with his right hand, with the intention of placing it on a water tank about 3 ft. from him. When it was a foot or so away from his body, it discharged.

"The bullet went through a wall 6½" thick and struck a small child who was in a bathtub in an adjoining apartment. The injury proved to be a very serious, permanent one, with the result that when the case was tried before a jury, a verdict of \$180,000 was returned on behalf of the child, and a further one of \$45,000 in favor of the parents. The verdicts were against both the City of Newark and Thomas."²

Cited in the trial by both sides was

the earlier New Jersey decision in *MacAndrew v. Mularchuk*, which established the rule of law "that a city is liable for failure to adequately train its police officers in the proper handling and safe use of the weapons they are to carry."³

With these three factors in mind, together with the assumption that construction costs would continue their inflationary spiral, the decision was made to construct a facility which would satisfy the training needs of Henrico's officers, as well as have the capacity to train many other local, State, and Federal enforcement officers. At the same time, the facility could provide an opportunity for many citizens to have a safe and convenient environment in which to practice marksmanship, become familiar with particular weapons, and enjoy their sport.

Obstacles

In undertaking such an enormous task, many obstacles became apparent. The current cost of construction, together with zoning and safety factors, were almost insuperable. Added to these were problems of site selection, a lack of construction details, the question of ideal shape and size, and whether or not the community would accept the concept. Also, the environmental impact of such construction would be an important factor. Would the Environmental Protection Agency (EPA) look kindly toward a project which would affect the existing envi-

ronment? Would the natural habitats of animal and fowl be affected? Would streams be diverted from their natural course? Would air quality be altered? Resolution of these obstacles and answers to these questions seemed to call for more resources than were available to the police agency. "Overwhelming!" "Too much!" "Not enough expertise on the police staff!" "Too little money!" "No ideal place for construction!" All of these comments were frequently voiced. But the police chief, determined that these obstacles could be overcome, encouraged the staff to press forward and not be discouraged. In time, the operation was put into high gear, and Henrico County was well on its way to constructing one of the finer firearms training facilities.

The Planning Process

From the outset, emphasis was placed on employing a proper plan-

"[E]mphasis was placed on employing a proper planning process in the development of the facility."

ning process in the development of the facility. The need was obvious, goals were defined, and alternatives were examined.

Need—A place for police training and citizens' use.

Objective—To construct a facility to meet both these needs with minimum expense.

Research—Other training sources were looked at first. As an alternative

to independent construction, could the agency opt for discontinuance of training, particularly in light of the New Jersey court decision?

—Site selection process (much work was done in this research phase);

—Employ architect-engineer (this was done to allow them to be a part of the planning process from the beginning and to be tapped as an input source—they accompanied staff on visits to view other ranges);

—Number of ranges and number of shooter positions—how many to satisfy training needs;

—Configuration of complex—safety features, aesthetics, etc.;

—Berm characteristics—height, width, material;

Range tower and storage building.



—Ricochet considerations, etc.

Development—Agree upon construction sequence (range berms first, followed by target erection, trap houses, and finally observation tower);

—Number of shooter positions;

—Type of courses to be built;

—Electrical wiring plan, conduit;

—Underground drainage system, water supply;

—Walkways, parking areas;

—Landscaping.

Implementation—Plans drawn;

—Bids requested, low bid accepted;

—Construction begun.

Site Selection

The first effort centered around site selection. Research revealed there

were several prime considerations in the selection of an ideal site. These criteria were:

1. Choose an area where stray or fallout ammunition would pose no threat or danger to the adjoining community.

2. Land acquisition should not be cost-prohibitive.

3. The area should have the potential to be relatively free from public complaints of noise, encroachment, traffic, etc.

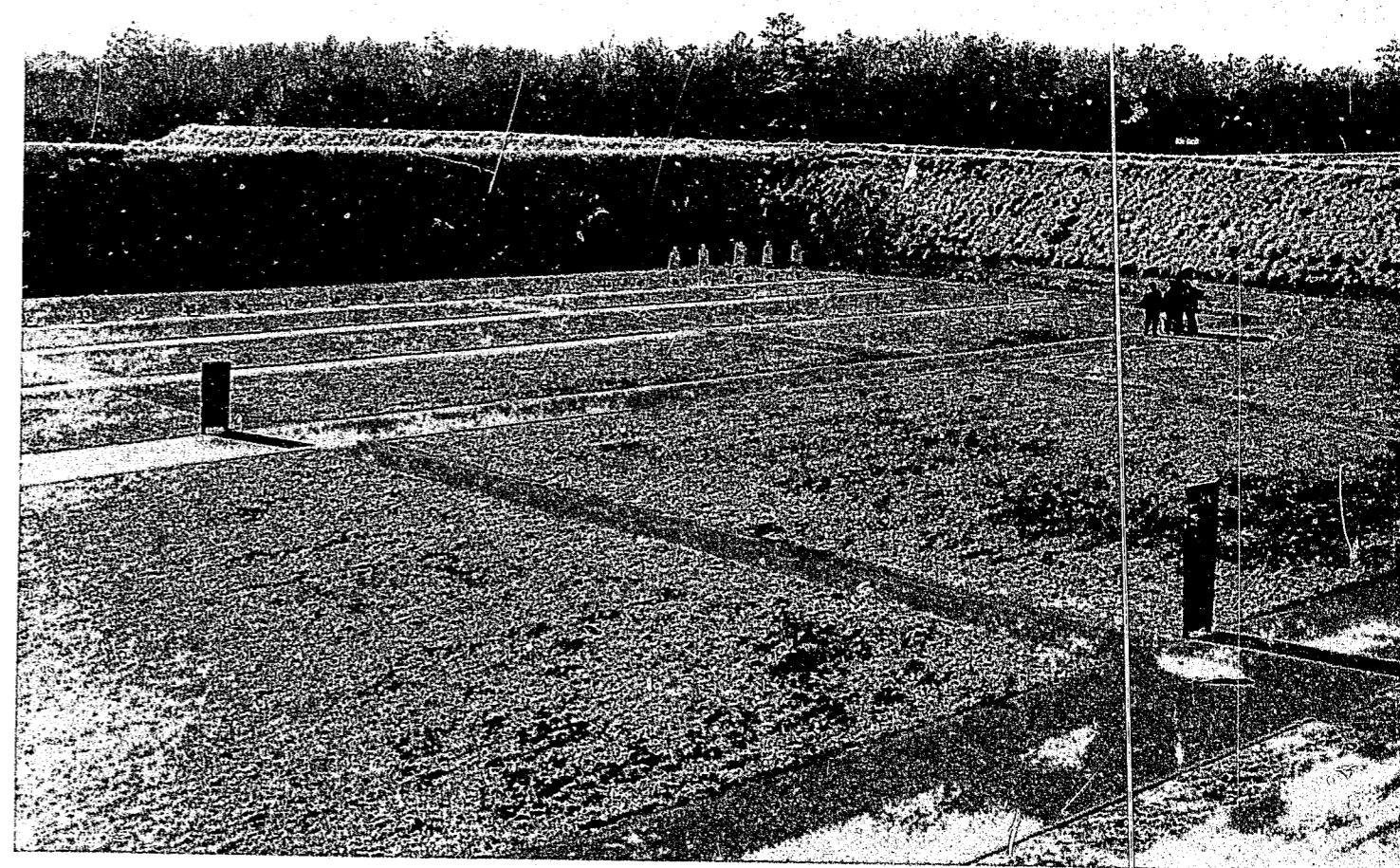
4. Choose an area free from economic development for at least 20 years. Property with a high potential for economic development would be a greater financial asset to the county than would property without the potential. In this case, 15 acres without economic development potential

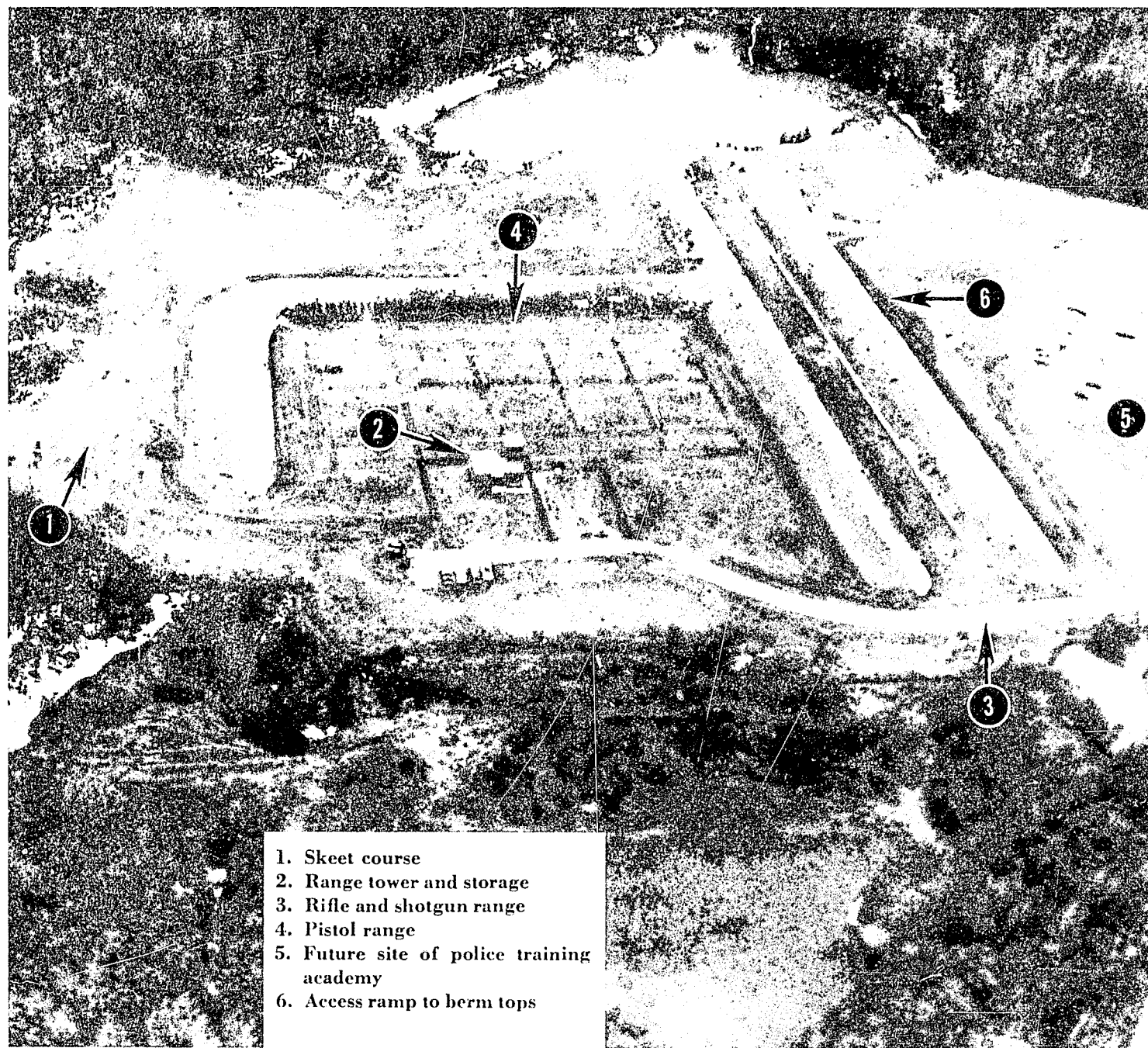
would be worth, for instance, \$30,000. With the economic potential, the same property might have a value of as much as one-half million dollars. Few municipalities could afford to commit such expensive real estate to police training.

Obviously, county-owned property was considered first. The first such site revealed residences too close, which would conflict with Nos. 1 and 3 of the site selection criteria. The second site considered did not meet site selection criterion No. 4. Finally, the selection effort began to focus on an old gravel pit, long since abandoned as a productive mining source.

While the terrain was generally in a very uneven state, typical of most gravel pits, the site did meet all of the criteria established. There was no im-

View of pistol range from observation tower showing visual control capability of range master.





1. Skeet course
2. Range tower and storage
3. Rifle and shotgun range
4. Pistol range
5. Future site of police training academy
6. Access ramp to berm tops

mediate cost since the property was county-owned (No. 2 criterion satisfied); the closest residence was some distance away on one side and well separated on another side by a wide, low swampy area (Nos. 1 and 3 satisfied); and studies revealed that the economic development of the area would not occur within the next 20 years, thus allowing many years of use without being displaced (No. 4 criterion met).

After the site was agreed upon, a Federal EPA Environmental Impact

Statement was filed, a staff member appeared before an EPA panel, and clearance was given to proceed. The panel agreed that nature would not be adversely affected; i.e., animals would not be displaced, streams would not be diverted or polluted.

Safety Features

Of extreme importance from the outset was that the range should be so designed to include maximum

safety features. The central problem, of course, was how to contain ex-

"Of extreme importance from the outset was that the range should be so designed to include maximum safety features."

posed lead within the confines of the berm area. Ricochets, as well as lead fired over the top of the berms, held the danger of becoming "fall-out" on the roofs of homes as far

away as one-half mile.

This containment of fallout posed a serious problem. While there was confidence that the berms would be broad enough to prevent penetration, the lack of berm height meant that some lead might escape. High construction costs precluded the berms being too tall. What could be done about accidental rounds fired over these berm tops and ricochets? In order to reduce this fallout factor, the individual miniranges within the total complex were so designed that the shooter positions would be facing in a southerly direction, shooting away from the homes within bullet fallout distance. Stray rounds would fall harmlessly into the adjoining woods.

Of note here, too, is the design configuration to prevent the firing lanes facing either the morning or evening sun. Shooter position facing either north or south is much more desirable than the alternative, in which case shooters are blinded by either the morning or evening sun.

Size and Configuration

Studies of the local needs showed that three courses would be required to provide the skill training needed by law enforcement. These courses were pistol, shotgun and rifle, and skeet. The multitude of officers needing annual training dictated that a large pistol course be considered, thus the pistol range was designed to accommodate 50 shooters at one time (similar to the FBI's Practical Pistol Course (PPC) at Quantico, Va.).

The rifle and shotgun range was designed to meet the standards of the U.S. Army, which includes the 1000-inch shooter position; this range was constructed to allow four shooters to participate at one time. The skeet course design was a traditional one, recommended by several major ammunition suppliers and national skeet & trap associations, and incorporated

many of the positive features of the FBI's skeet range at Quantico.

While the individual range construction details had been ironed out, there remained the design problem of how to place the course pieces together in a total puzzle to allow safe shooter participation on all three courses simultaneously. After much study of ricochet effects, as well as examining the penetration potential of expended lead, the decision was to place each course side by side, with the skeet course so arranged to prevent expended rounds from falling down on the heads of shooters on the pistol and rifle range courses.

Physical Plant

The next phase of construction consisted of the observation tower/storage physical plant. Many designs were studied and various persons were interviewed to determine the ideal construction design. Such factors as the range officer's need to observe maximum activity, thus controlling behavior as well as storage needs, played a great role in determining the ultimate building design.

Incorporated into the building was a tower 26 feet above ground level, the access to which was limited to an inner-building, small spiral staircase. A large covered opening was designed into the tower floor, which would allow for entry of equipment and furniture into the upper section.

Safety of those occupying the observation tower was a serious consideration. To reduce the danger of ricochets and poorly aimed shots, the glass in the observation tower was designed of 7/16-inch bullet-resistant material strong enough to repel angular strikes. An added feature of this heavy glass is the vandalism and burglary resistance offered. Since the ground floor of the building has no windows, the threat of burglary and vandalism is further reduced.

Cost

Total cost of the range was approximately \$260,000, with the berm construction and other earth-moving tasks accounting for two-thirds of the expense. On the basis of the maximum number of people the larger range can accommodate at one time (50), this represents a cost of little more than \$5,000 per shooter position required. Of course, the construction cost decreased in proportion to the increased numbers of shooter positions required. But this cost figure can serve as a guide to others who are thinking of constructing their own firearms training facility.

Civilian access to the range will be instituted upon completion of all facilities. The policy is to allow citizens use of the range on weekends at a fee designed to cover the cost of supervision, as well as liability insurance. Henrico County police will supervise the range with strict adherence to all rules and regulations governing the safe use of firearms.

Future plans are to open the range 16 hours each day, as well as to allow some weekend activity. Citizens who wish to practice their marksmanship and acquaint themselves with their firearms will have a safe and convenient environment for such activity, while at the same time have convenient hours. The area law enforcement personnel will have a modern and convenient facility where they can keep abreast of the firearms training needs required by State and Federal laws, as well as subscribe to judicial rulings placed upon these officers.

FOOTNOTES

¹ *Peer v. City of Newark*, 71 N.J. Super. 12, 176 A 2d 249 (App. Div. 1961).

² Judge Bartlett Rummel, "Police Firearms Training: An Inquiry into the Governmental Duty to Provide Adequate Training," *The American Rifleman*, August 1963, p. 17.

³ 56 N.J. Super. 219, 152 A 2d 372 (App. Div. 1959).

END