THIN TARGET AREA

A. D. Krisch and D. I. Meyer
University of Michigan

September 5, 1967

It is very important to have a target area in the extracted proton beam in which only thin targets (~1-2% of an interaction length) would be allowed. In such an area only light shielding would be necessary; this would have the following advantages.

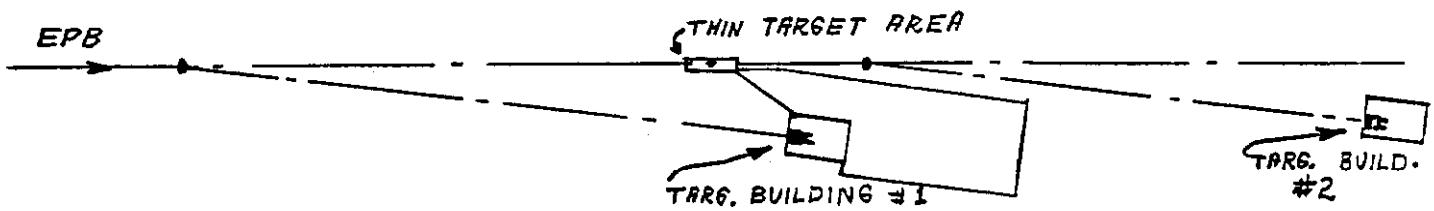
a.) Parasite or low intensity experiments could be rigged in and out easily and at low cost.

b.) Proton Proton collision experiments requiring high intensity through a thin H_2 target could be placed in the EPB without the massive rigging effort necessary to remove a primary target station.

Advantage a would provide both testing facilities and an opportunity for young and unknown groups to develop into experienced groups without a heavy commitment of accelerator facilities. Advantage b would allow frequent running time

for a class of experiments which is likely to become more important in the 200 GeV energy range.

A suggested position for such an area is between the two branchpoints on the EPB as shown.



The details of this thin target area are shown in Fig. 1 and Fig. 2. The area is essentially a widening of the tunnel (30 feet wide by 160 feet long) with a crane. Earth shielding is used and pipes of 1 → 2 foot diameter are put through the earth to bring the beams out. The beams are deflected into these holes by septum and steering magnets. The target position should be variable by ±50 feet to obtain the proper position and angle to send the appropriate particles down the beampipes.

The beams of produced particles go out to the large concrete pad as shown. This pad is adjacent to a primary target building, so that the source of utilities is nearby.

The proton proton collision experiments would have the H_2 target, some analyzing magnets and possibly some detectors inside the target area. By using steering magnets a large

range of center of mass angles and momenta can be covered without physically moving any magnets. For double arm experiments temporary pads would be necessary for the equipment in the left arm placed outside the target area. A few utility outlets and beam ports should also be placed on the left side.

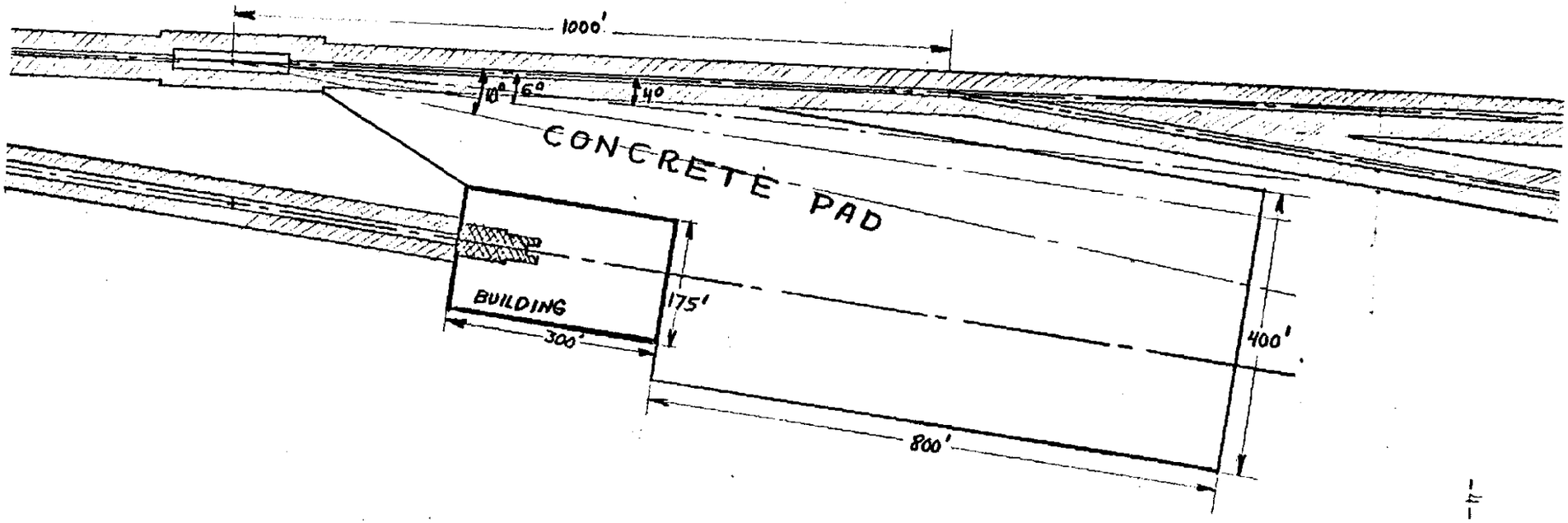
for π beams of medium intensity steering magnets and quadrupoles would be used in the target area. It is possible to get beams with P_{max} of 25, 50, and 100 GeV/c out simultaneously from a single target at production angles of .010, .005 and .002 radians respectively. Lower energy beams at larger angles could also be utilized.

Conclusion:

A thin target area will be valuable and probably inexpensive. The absence of such an area may effectively exclude two classes of experiments.

FIG 1 SCALE 1" = 200 feet

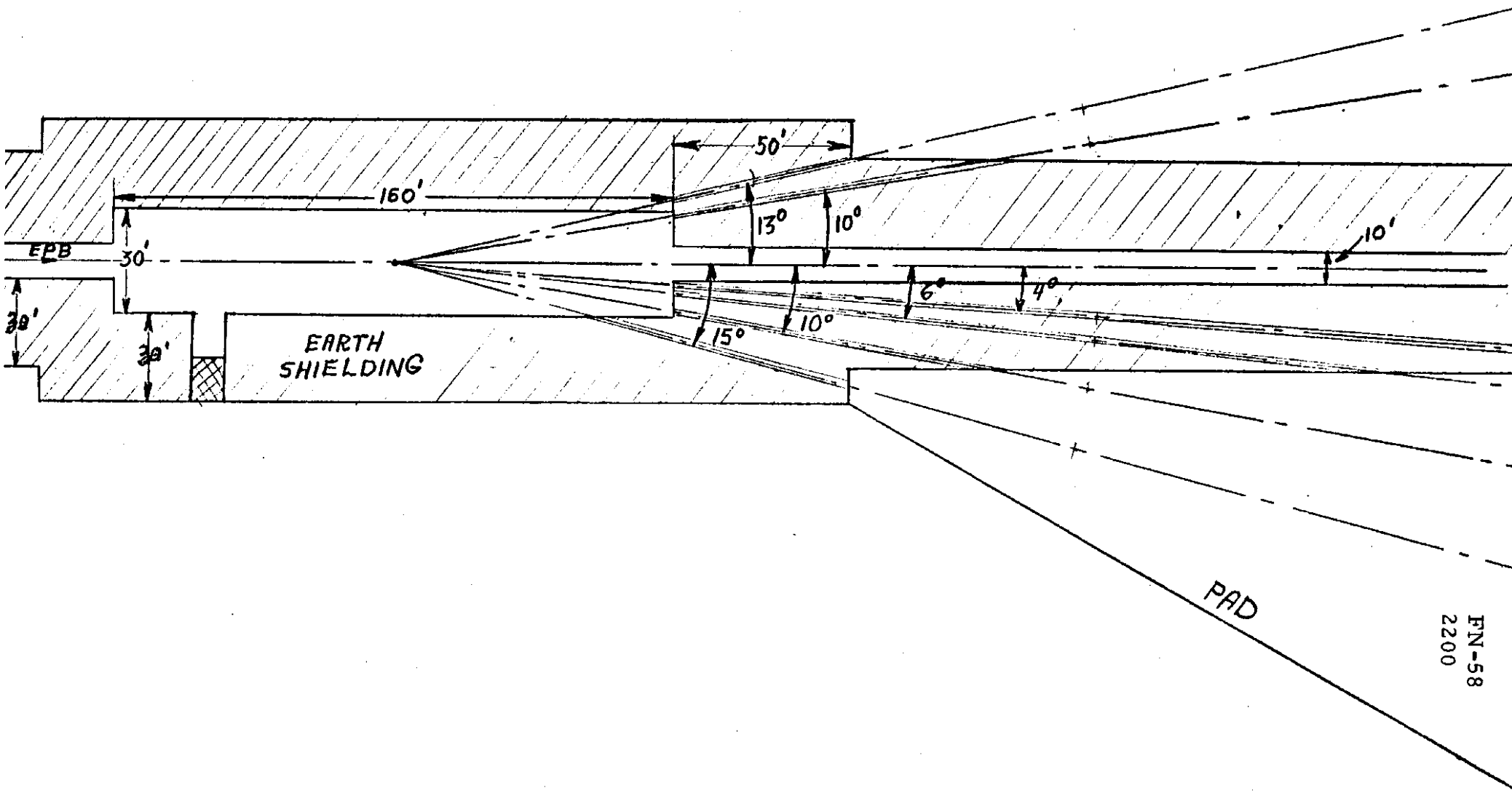
AD KRISCH Aug 30 1967



FN-58
2200

FIG 2

SCALE 1" = 40 feet
A D KRISCH AUG 30 1967



FN-58
2200