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PRELIMINARY REPORT

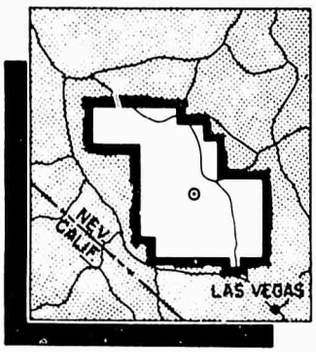
# Operation TEAPOT

## NEVADA TEST SITE

February – May 1955

Project 39.4c

**TECHNICAL PHOTOGRAPHY OF PHYSICAL PHENOMENA**



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Operation Teapot Preliminary Report

Project 39.4c

# TECHNICAL PHOTOGRAPHY OF PHYSICAL PHENOMENA

By

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Approved by: R. L. Corsbie
Director, Program 39
Director, Civil Effects Test Group

Edgerton, Germeshausen & Grier, Inc.
Boston, Massachusetts
Las Vegas, Nevada

May 1955

This is a preliminary report based on all data available at the close of the operation. The contents of this report are subject to change upon evaluation for the final report. Conclusions and recommendations drawn, if any, are tentative. The work is reported at this time in order to provide early test results to those concerned with effects of nuclear weapons and to provide for an interchange of information between projects for the preparation of final reports.

ABSTRACT

Project 39.4c was organized to provide remotely-operated photographic coverage of blast and thermal damage to physical structures on the Apple II shot of Operation Teapot. A total of 48 cameras were operated at distances from ground zero of from 2750 ft. to 10500 ft. Both external and internal camera stations were utilized.

Results were generally quite successful. In most cases the view is obstructed by the dust cloud very shortly after shock arrival, but the records do show the mode of failures.

Projection prints of all of the records have been made available to those agencies requesting them.

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ILLUSTRATIONS

APPENDIX A STATION LAYOUTS

CHAPTER 1

## OBJECTIVE

The objectives of Project 39.4c, High-Speed Technical Photography, Physical Phenomena, were essentially to provide photographic coverage of blast and thermal effects upon physical structures. Pictures were taken in accordance with the requirements of other projects of the Civil Effects Test Group. This photography was all taken from unmanned stations at shot time during Apple II shot. It was hoped that two purposes could be served. The first was to provide photographic documentation of the mode and mechanism of structural failures; the second was to provide photographic footage that would be useful for imparting to the American public the message of Civil Defense.

CHAPTER 2

## BACKGROUND

The utility of remotely controlled cameras photographing effects tests has been demonstrated often in the past. In particular, the photography of Civil and Military Effects Tests during Operation Upshot-Knothole in the spring of 1953 demonstrated the effectiveness of this type of coverage.* Photographic records, made during a shot, can be invaluable in interpreting results obtained by other mechanisms.

* WT-779, "Operation Upshot-Knothole, Project 9.1, Technical Photography", January 1954

CHAPTER 3

# TECHNIQUES

## 3.1 GENERAL APPROACH

The general photographic approach leaned heavily upon the lessons learned from and equipment used for previous Operations in Nevada. The principal hazards to effects photography are blast, nuclear radiation, and obscuration by dust at shock arrival. Camera stations must be solidly constructed to avoid loss of the camera and record and to prevent undesirable motion of the camera itself. The film must be shielded to reduce film fogging due to nuclear radiations. These two things can be done. It may not be a simple matter, but rugged well-shielded camera installations are certainly technically possible though economically formidable.

The problem of dust obscuration is the most difficult one to cope with effectively. A vast quantity of dirt, raised from the desert floor and carried along by the shock front, obscures the picture at the precise moment when the record is most critical. The general solution to this problem is to elevate the camera above the dust. This procedure, however, further complicates the problems of blast and radiation protection. The higher the camera tower, the more rugged and expensive its construction must be. In addition, the problems of handling heavy radiation shields at substantial heights are manifold.

In the two following sections, the methods adopted for exterior and interior photography are discussed.

## 3.2 EXTERIOR PHOTOGRAPHY

In order to get above the dust raised by the shock wave, all cameras were placed on towers. These were the same towers used for the Military Effects Program on Operation Upshot-Knothole and were graciously loaned to the project by AFSWP. A typical tower is shown schematically in Figure 3.1. The tower consists of a guyed monopole with a small camera platform on top. The pole is an 8-inch steel pipe and is set in a reinforced concrete base. A cavity in the base houses the electrical control circuitry and batteries. Both 18 and 10-foot towers were used by the

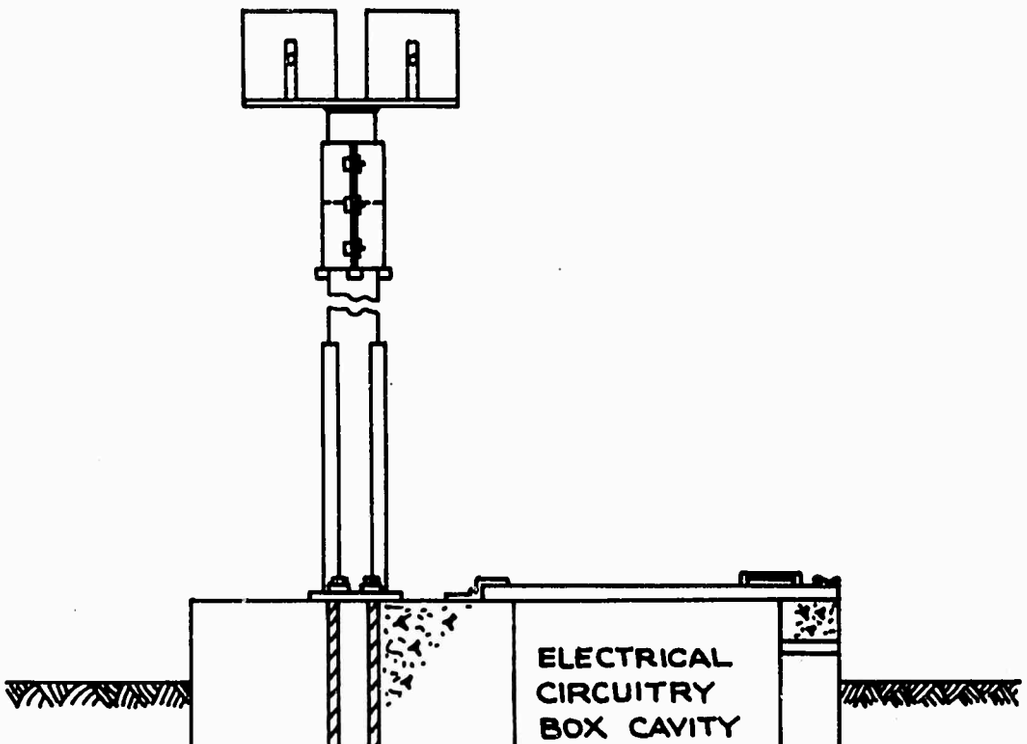


Fig. 3.1 Typical GSAP tower

project. The choice depended upon the height of the object being photographed and its distance from ground zero.

Stations H, H-1, and H-2 were nonstandard installations, at which the cameras were mounted to the structural members of Stations 35.2a1 and 35.2b1 (the guyed and self-supporting communications towers).

Figure 3.2 shows a typical 18-foot tower, and Figure 3.3 shows an electrical control box. The cameras in Figure 3.2 are shown covered with a plastic bag. This covering was used as a cleanliness measure on all external stations prior to the final loading.

In order to avoid film fogging due to nuclear radiation, cameras were placed inside steel boxes fitted with 2½-inch thick lead shields. All external cameras were shielded in this manner except those at Stations H, H-1, and H-2. These could not be shielded because of interference with the structural characteristics of the towers.

Because of the requirements for shielding, it was advisable to use physically small cameras. Consequently, the 16 mm GSAP (Gun Sight Aiming Point) camera was chosen for all stations. This camera operates at frame rates of either 16, 32, or 64 frames/sec. The lead shield for this small camera weighs approximately 350 pounds.

Obtaining properly exposed negatives is complicated by the rapidly varying light levels. This is particularly true for a pre-dawn detonation where there is no contribution from ambient light. As an insurance measure, two cameras were operated on each tower and their exposures set to cover the uncertainty in light level. This arrangement also serves to provide mechanical backup. Experience has shown that electrical backup is not required if care is taken in setting up the stations. The circuitry is simple: a 28-volt battery supply, a timing signal relay, and a cam timer to control the running time of the cameras.

In order to minimize the problems of dust obscuration, it is necessary to place the camera tower as close as possible to the station being photographed. This is accomplished by using wide angle lenses whenever feasible.

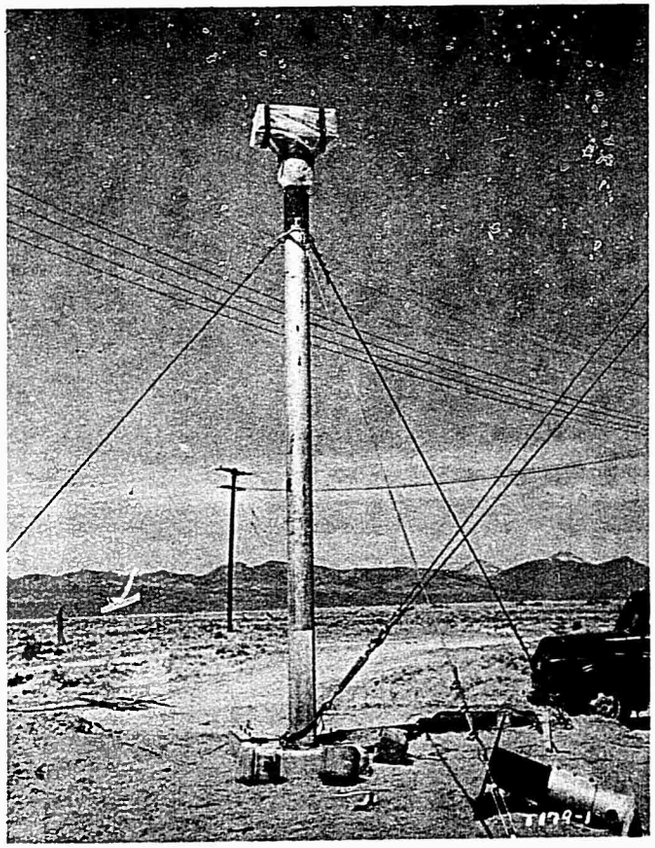

Fig. 3.2 Typical 18' GSAP tower

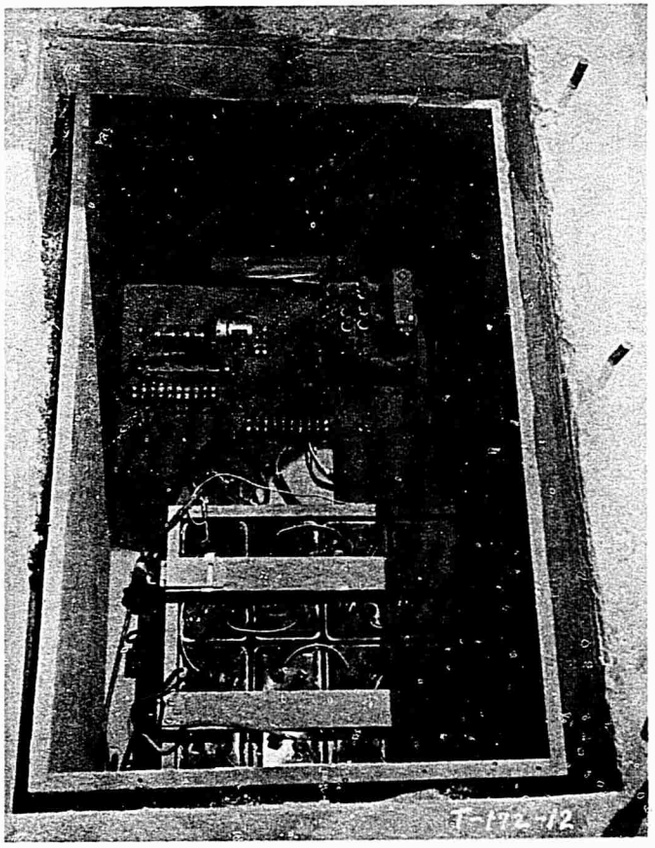

Fig. 3.3 Typical GSAP electrical control box

## 3.3 INTERIOR PHOTOGRAPHY

Because of the high radiation fields associated with nuclear detonations, it is advisable to use insensitive films. Data show that two films that differ in light sensitivity by, for instance, a factor of ten will differ in sensitivity to nuclear radiations by a much greater factor. In interior photography, where it is necessary to provide artificial illumination, one essentially has the choice of using fast emulsions, a larger amount of shielding, and relatively little light, or slow emulsions with less shielding and more light. For this work, it was decided to utilize the slow emulsions because of the difficulty in handling heavy lead shields in quarters where space is limited.

The film most used in this work is a special Eastman Kodak emulsion, Number SO-1112. The film has a speed rating of approximately 1 and a radiation tolerance of greater than 1000 roentgens. Photography of an object of average reflectance at 16 fr/sec, f/2.5, requires greater than 1000 foot-candles illuminance.

The following G.E. lamps were utilized. All are nominally 28-volt dc lamps and were operated at 14% over voltage. This results in a 50% increase in luminous output.

| Lamp No. | Rated Voltage | Beam Candlepower on Axis | Beam Spread to 10% of Max $C_p$ |
|---|---|---|---|
| GE 4570 | 28v dc | 30,000 | 50° x 9° |
| GE 4572 | 28v dc | 4,000 | 55° x 55° |
| GE 4541 | 28v dc | 450,000 | 14° x 11° |

Figures 3.4 and 3.5 illustrate typical interior setups.

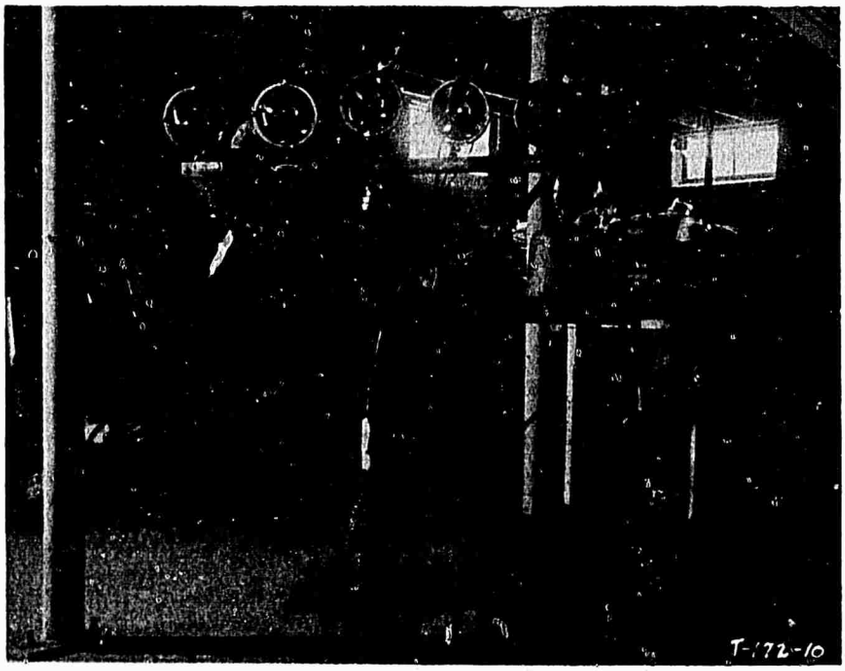


Fig. 3.4 Station C-1, basement of 31.1a1

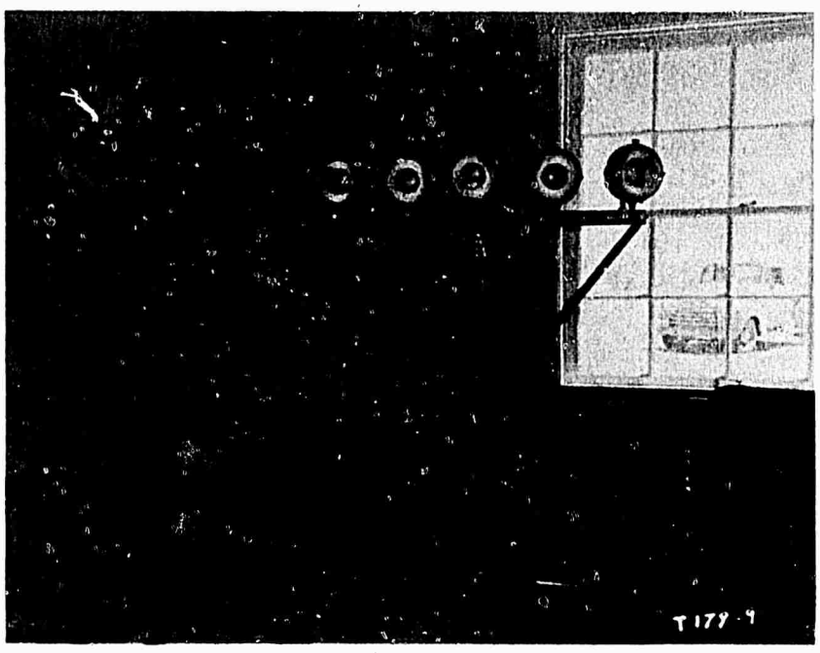


Fig. 3.5 Station I-2, living room of 31.1b1

CHAPTER 4

## SCOPE OF PROGRAM

Table 4.1 summarizes the photographic coverage provided by Project 39.4c. A total of 48 cameras were operated.

The identification of programs and projects in Table 4.1 is as follows:

Program 31 - Response of Residential, Commerical and Industrial Structures and Materials to Nuclear Effects

- 31.1 - Damage to Conventional and Special Types of Residences Exposed to Nuclear Effects
- 31.2 - Damage to Commercial, Institutional and Industrial Structures and Contents Exposed to Nuclear Effects

Program 34 - Shelters for Civil Population

- 34.1b- Evaluation of Outdoor Family Shelters Exposed to Nuclear Effects

Program 35 - Utilities, Services and Associated Equipment Exposed to Nuclear Explosions

- 35.1 - Electric Utilities
- 35.2 - Communications Equipment
- 35.4 - Industrial and Domestic Gas Storage and Distribution

Program 36 - Mobile Housing and Emergency Vehicles

- 36.1 - Utilization of Trailer Coach Mobile Homes Following Exposure to Nuclear Effects

Appendix A shows the approximate layouts of the stations and cameras. Appendix B contains copies of the Station Loading Sheets, which list pertinent data regarding the cameras and their setups.

Table 4.1 - PHOTOGRAPHIC COVERAGE

| Program | Station Viewed | Description |
|---|---|---|
| 31 | 31.1a1 (4700') | 2-story brick and cinder house (exterior and interior) |
| | 31.1a2 (10500') | 2-story brick and cinder house (exterior) |
| | 31.1c1 (4700') | 1-story frame house (exterior and interior) |
| | 31.1c2 (10500') | 1-story frame house (exterior and interior) |
| | 31.1e1 (4700') | 1-story precast concrete house (exterior and interior) |
| | 31.1f1 (4700') | 1-story reinforced masonry house (exterior and interior) |
| | 31.1f2 (10500') | 1-story reinforced masonry house (exterior) |
| | 31.1b1 (5500') | 2-story redesigned frame house (exterior and interior) |
| | 31.1b2 (7800') | 2-story redesigned frame house (exterior) |
| | 31.2e1 (5500') | Chemical plant control room (exterior) |
| | 31.2a1 (6800') | Aluminum butler building (exterior) |
| | 31.2b1 (6800') | Behlen building (exterior) |
| | 31.2d1 (6800') | Armco Steelox (exterior) |
| 34 | 34.1h (2750') | Pre-cast reinforced concrete shelter (exterior) |
| | 34.1i (2750') | Poured reinforced concrete shelter (exterior) |
| | 34.1j (2750') | Masonry block utility shelter (exterior) |
| 35 | 35.1a (4700') | Transformer substation |
| | 31.1f1 (4700') | Interior cameras viewing telephone switchboard and A.M. broadcasting station |
| | 35.2a1 (4865') | Standard A.M. broadcast tower |
| | 35.2b1 (4865') | Communications tower |
| | 35.4c (4700') | L.P. gas pumping and distribution tank |
| 36 | 36.1a1 (10500') | House trailer array |

CHAPTER 5

## RESULTS

Because of the nature of the project, the results are best presented in pictorial rather than verbal form. Accordingly, projection prints of all footage have been prepared and distributed to those agencies requesting them. These prints are complete copies of all exposed footage, rather than being edited to show only the more dramatic or forceful scenes. Three reels of film were prepared. Their contents are described in Table 5.1. A description of the object viewed by each of the films is given in Appendix B.

Table 5.1 - PROJECTION PRINT MAKE-UP

| Reel | Film Numbers |
|---|---|
| L-145 | 29240, 29241, 29242, 29243, 29244, 29245, 29246, 29247, 29248, 29249, 29250, 29251, 29252, 29253, 29254, 29255, 29256, 29257, 29258, 29259, 29260, 29261, 29262, 29263, 29264, 29265 |
| L-146 | 29270, 29271, 29273, 29274, 29275, 29276, 29277, 29278 |
| L-147 | 29280, 29281, 29282, 29283, 29292, 29254, 29284, 29285, 29286, 29287, 29288, 29289, 29290, 29291 |

It is felt that the results are very satisfactory. As envisioned, obstruction by dust was the major problem. The views from the external camera stations, particularly those at 2750 ft. and 4700 ft. from ground zero, were obstructed shortly after shock arrival by the dust cloud. However, the records do document the early stages of blast interaction. The coverage during the thermal phase is satisfactory in all cases.

The internal photography was not as successful as the external. Apparently great volumes of solid particles, both from the desert floor and from the materials of construction, filled the interiors of the houses immediately after shock arrival. In general, the photography shows the thermal phase, and only two or three frames after shock arrival before the view is completely blocked by the dust. The interior photography of Station 31.1b1 at 5500 ft. and Station 31.1c2 at 10500 ft. are exceptions to this. Because

of their greater distance from the burst, there is less obstruction and the documentation is rather better than from the stations at the 4700 ft. line.

All cameras operated satisfactorily. However, film No. 29272, photographing the Aluminum Butler Building (Station 31.2a1), is useless. This camera was apparently loaded with a magazine that had been run several years previously in routine testing and not processed. Both the film loading and camera loading personnel check the magazine footage counter in order to prevent just this occurrence, but apparently this magazine had a defective footage counter which registered full even though the magazine had been run. No data were lost through this slip-up, because the back-up record No. 29271 is perfectly adequate.

# APPENDIX A

# STATION LAYOUTS

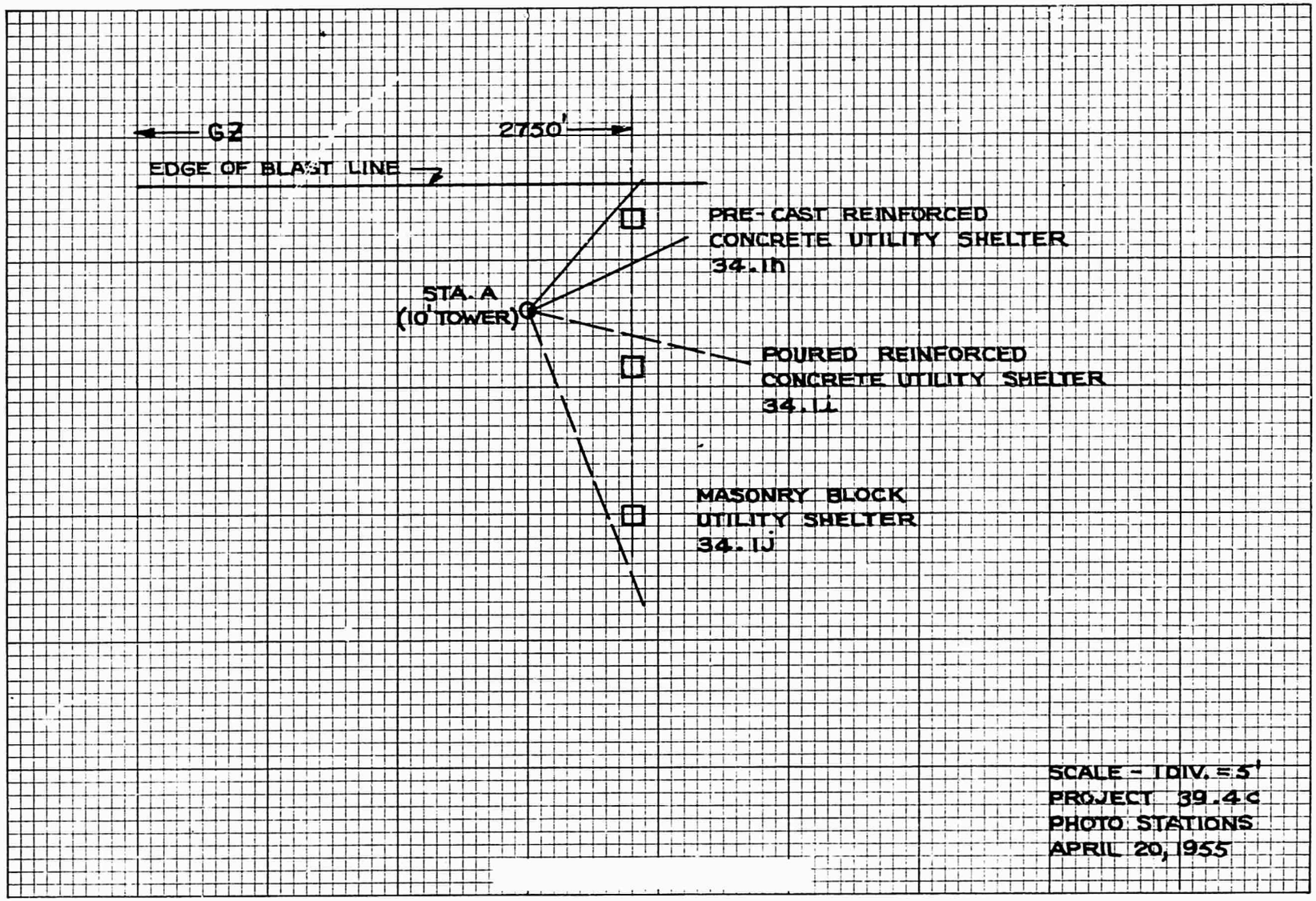


Fig. A-1 Photostation A

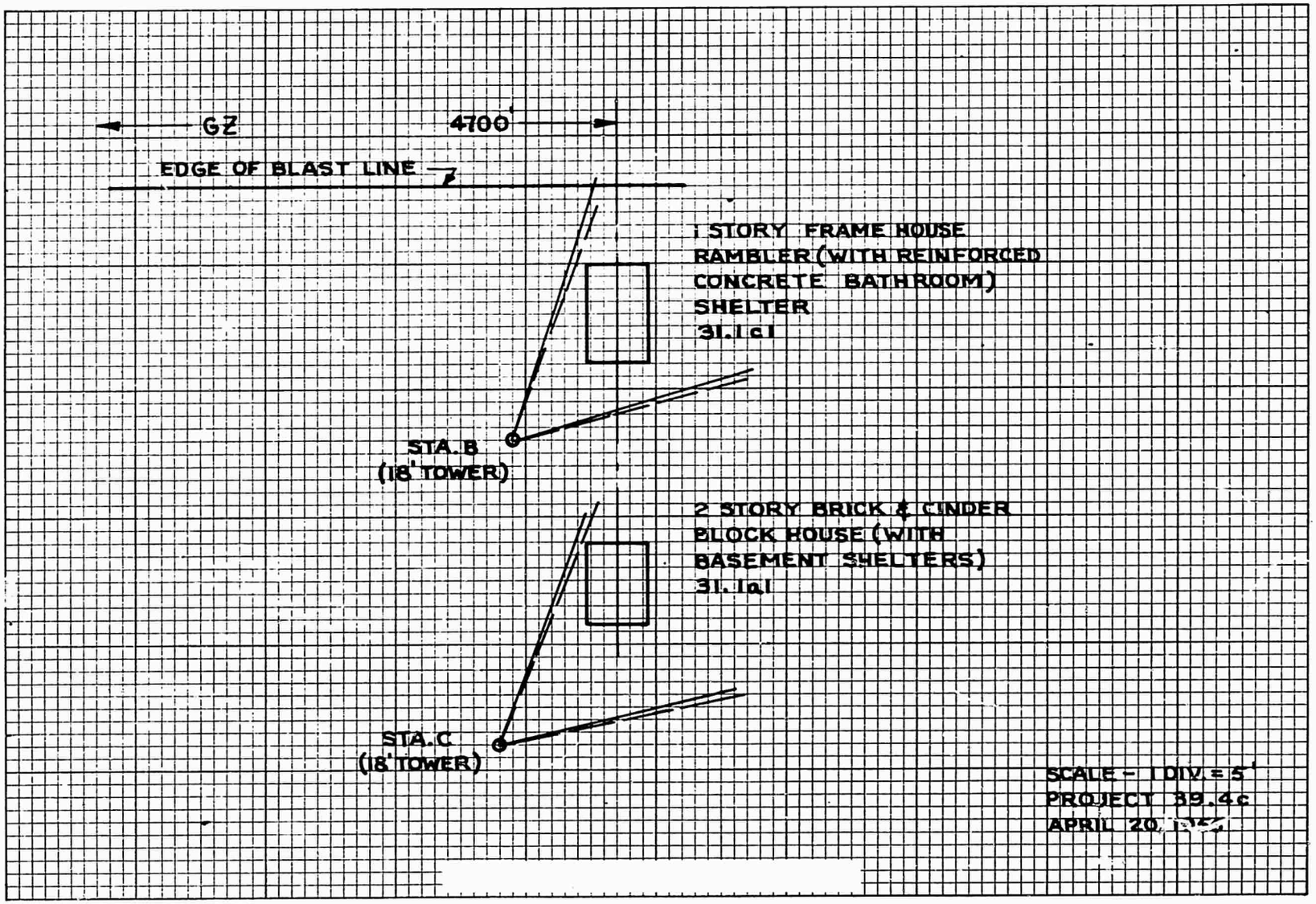


Fig. A-2 Photostations B and C

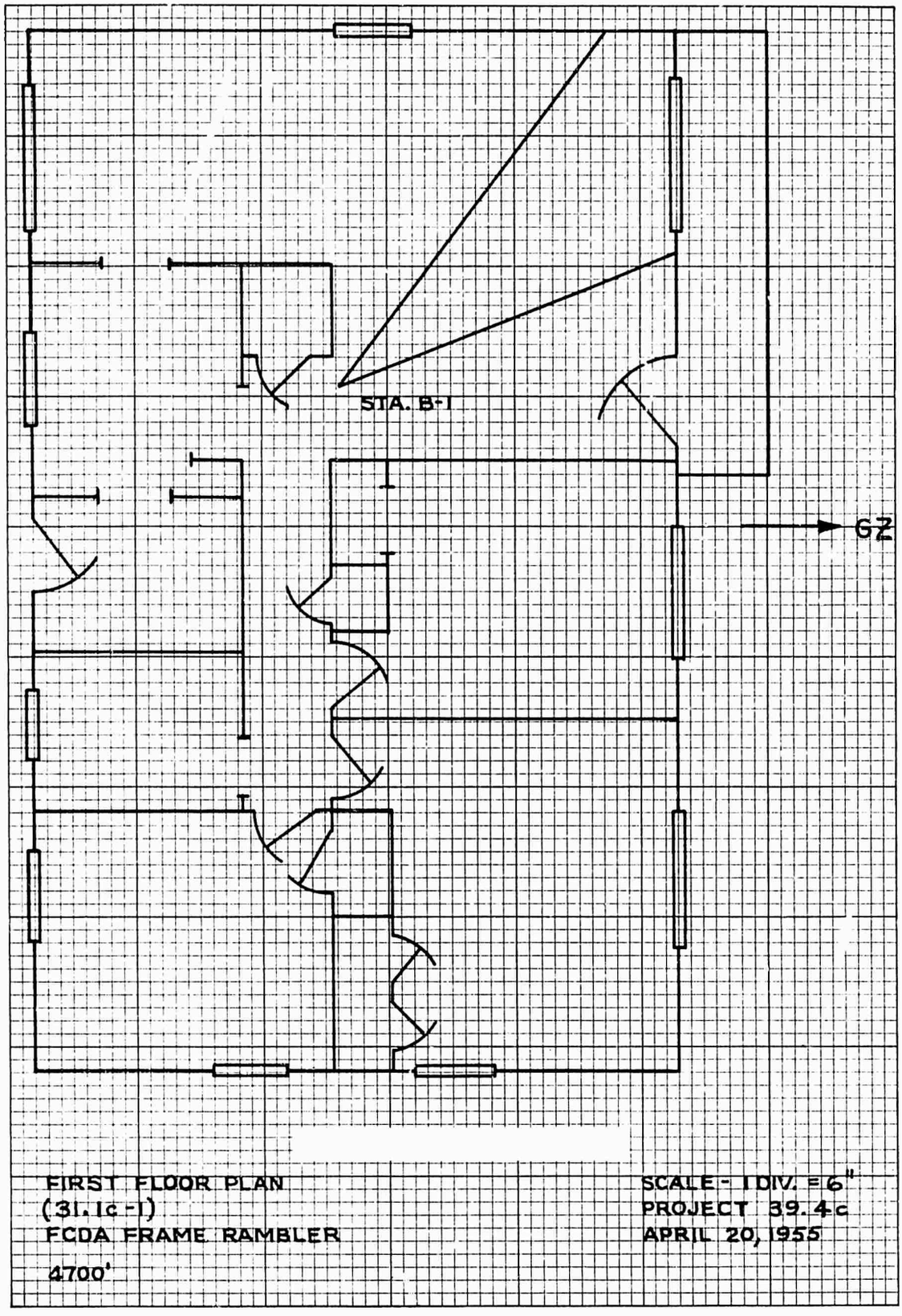


Fig. A-3 Photostation B-1

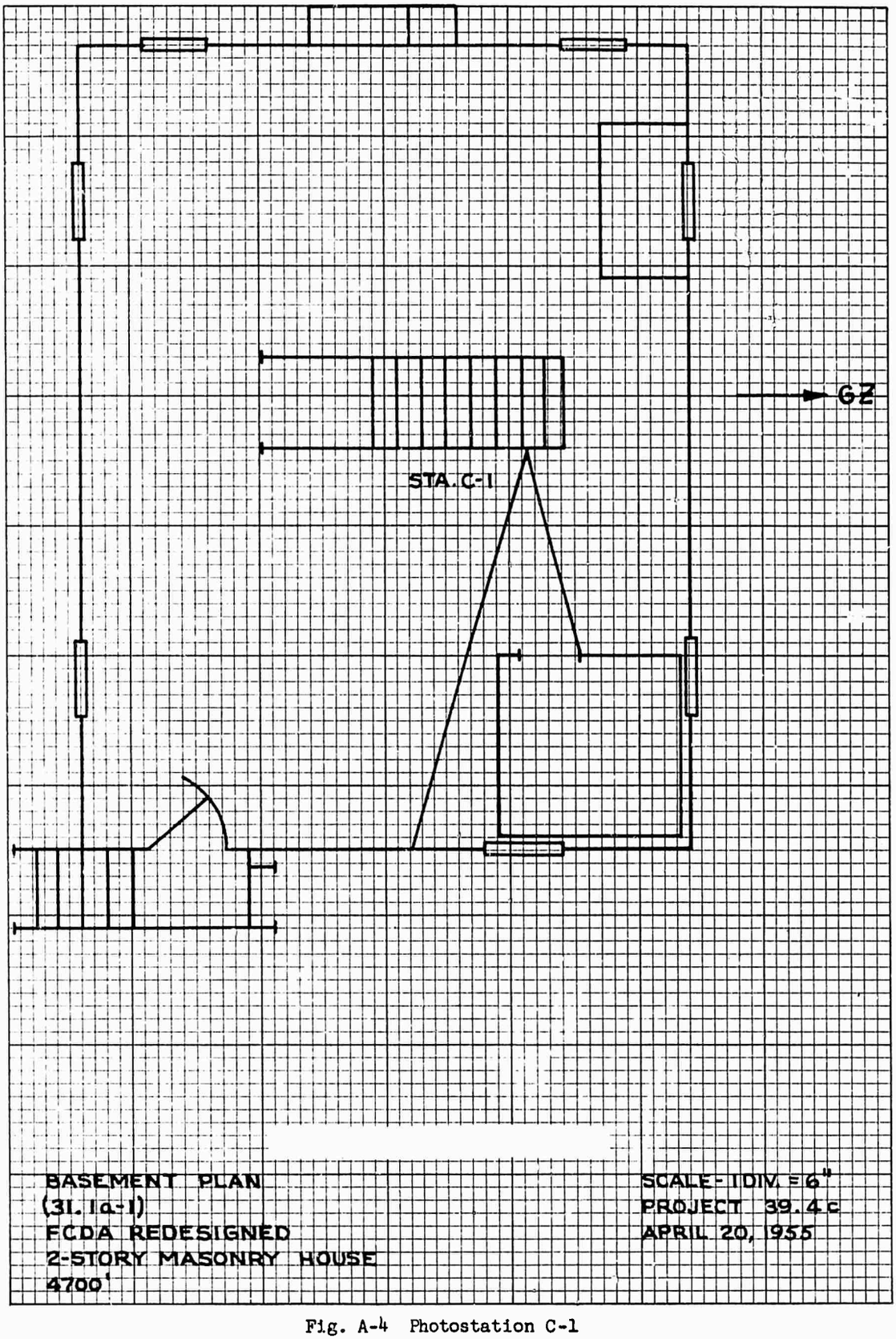


Fig. A-4 Photostation C-1

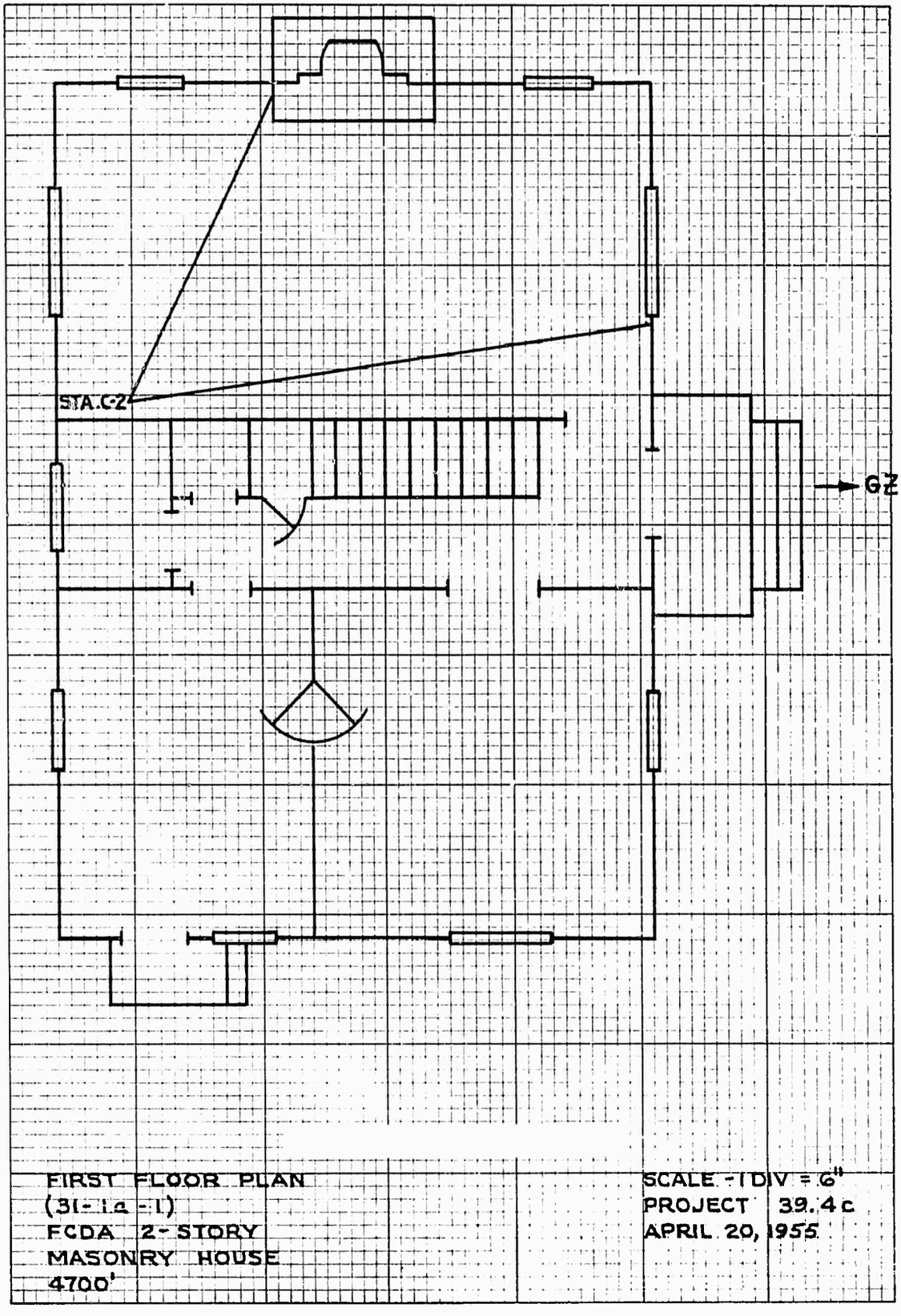


Fig. A-5 Photostation C-2

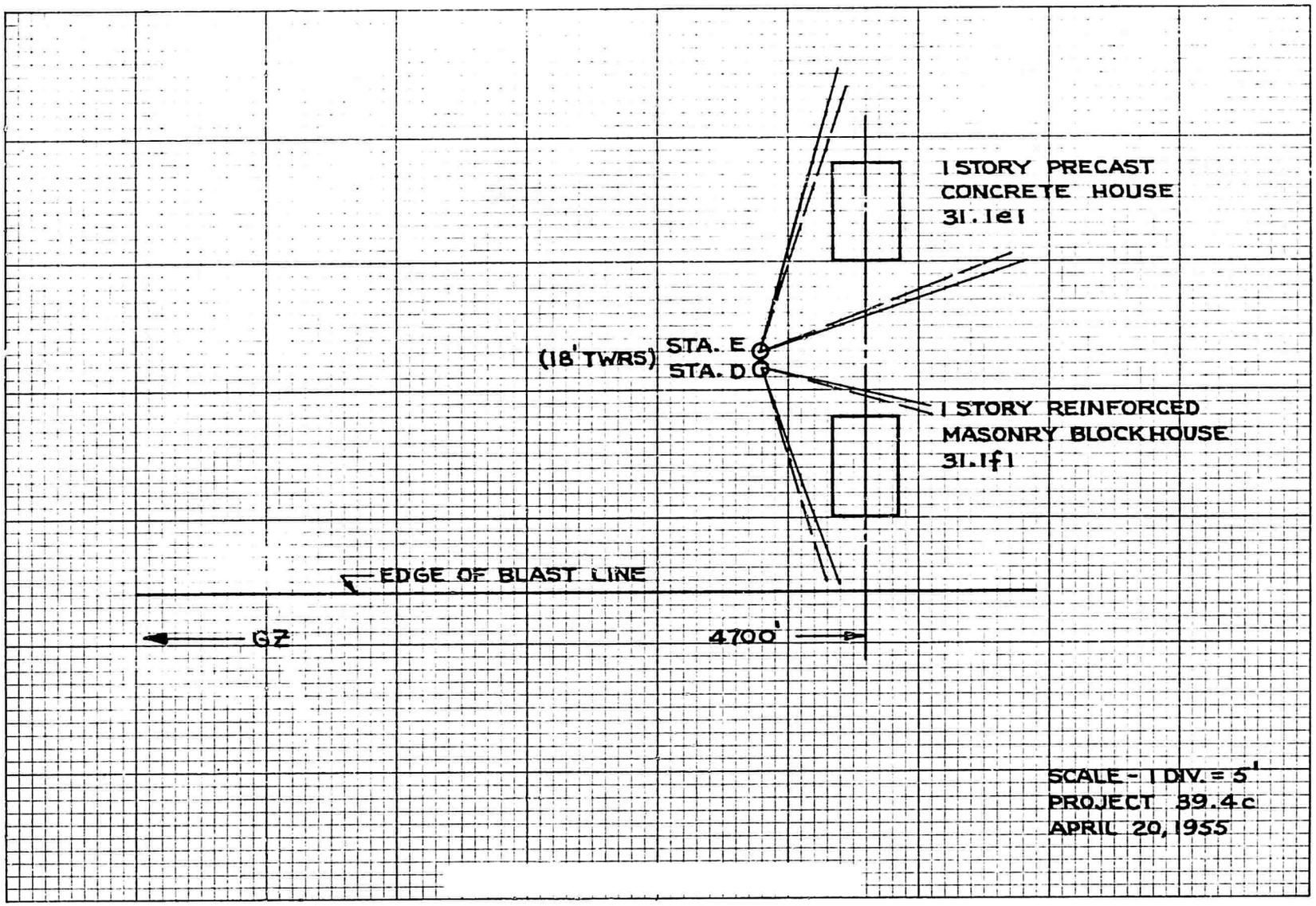


Fig. A-6 Photostations D and E

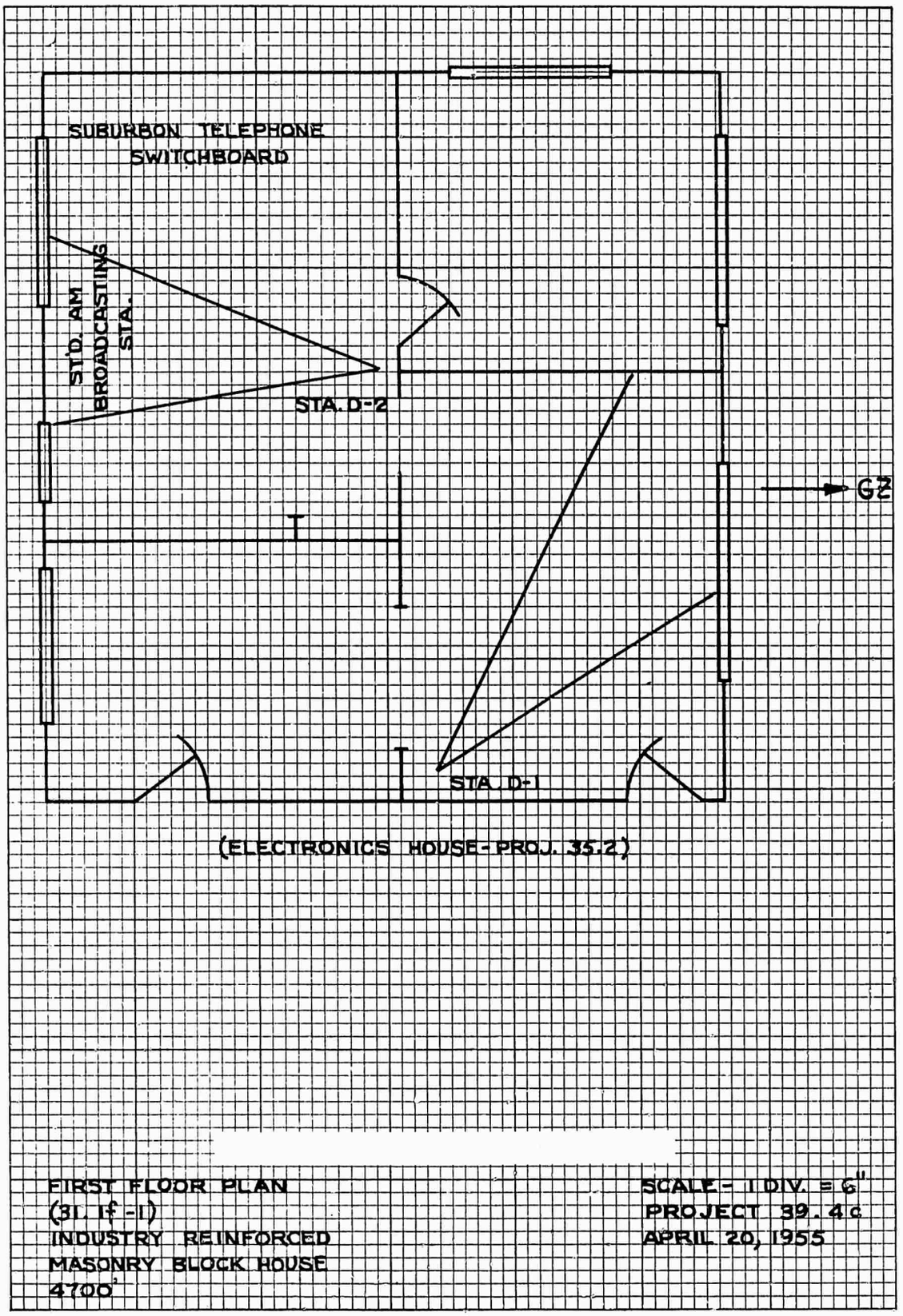


Fig. A-7 Photostations D-1 and D-2

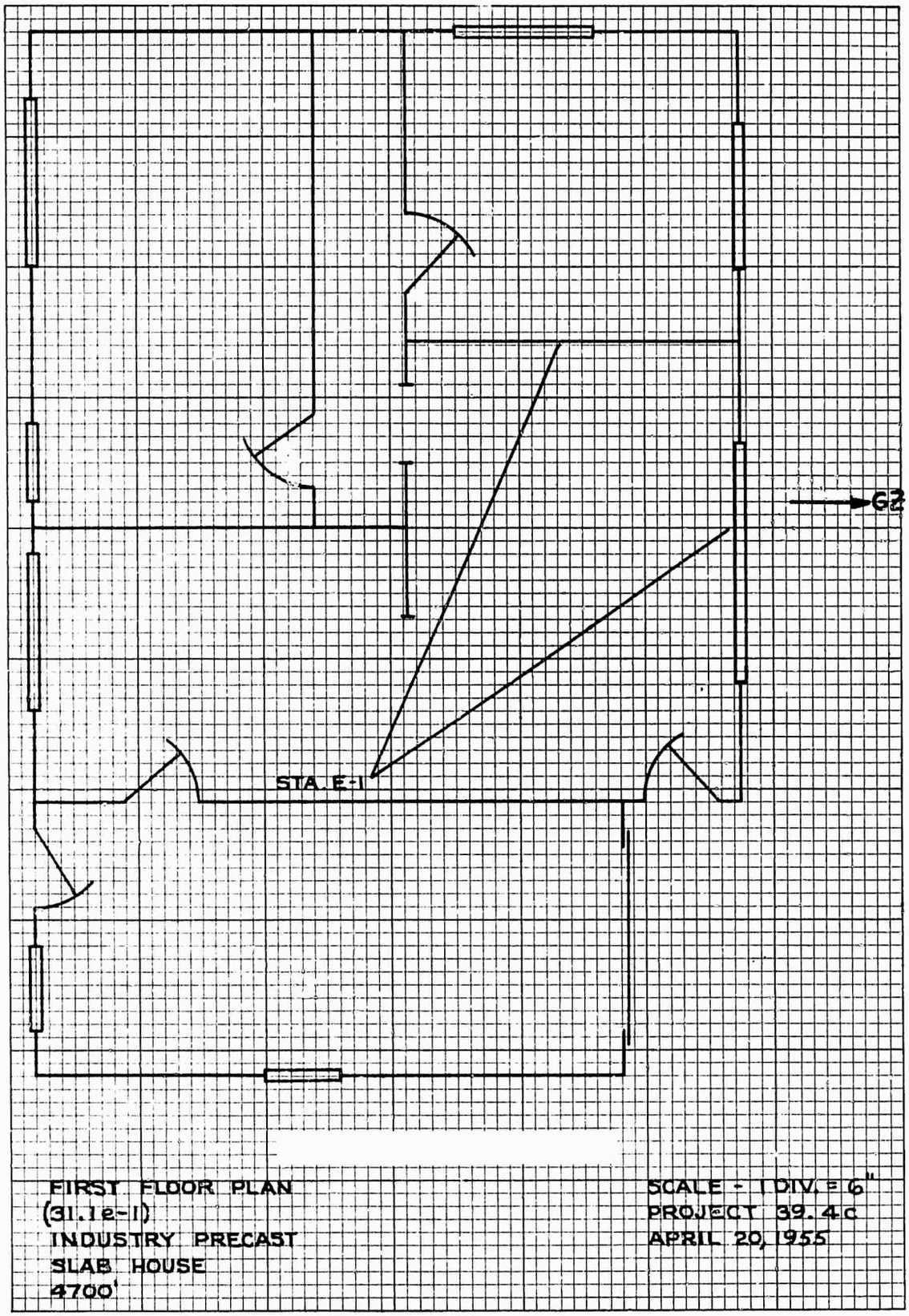


Fig. A-8 Photostation E-1

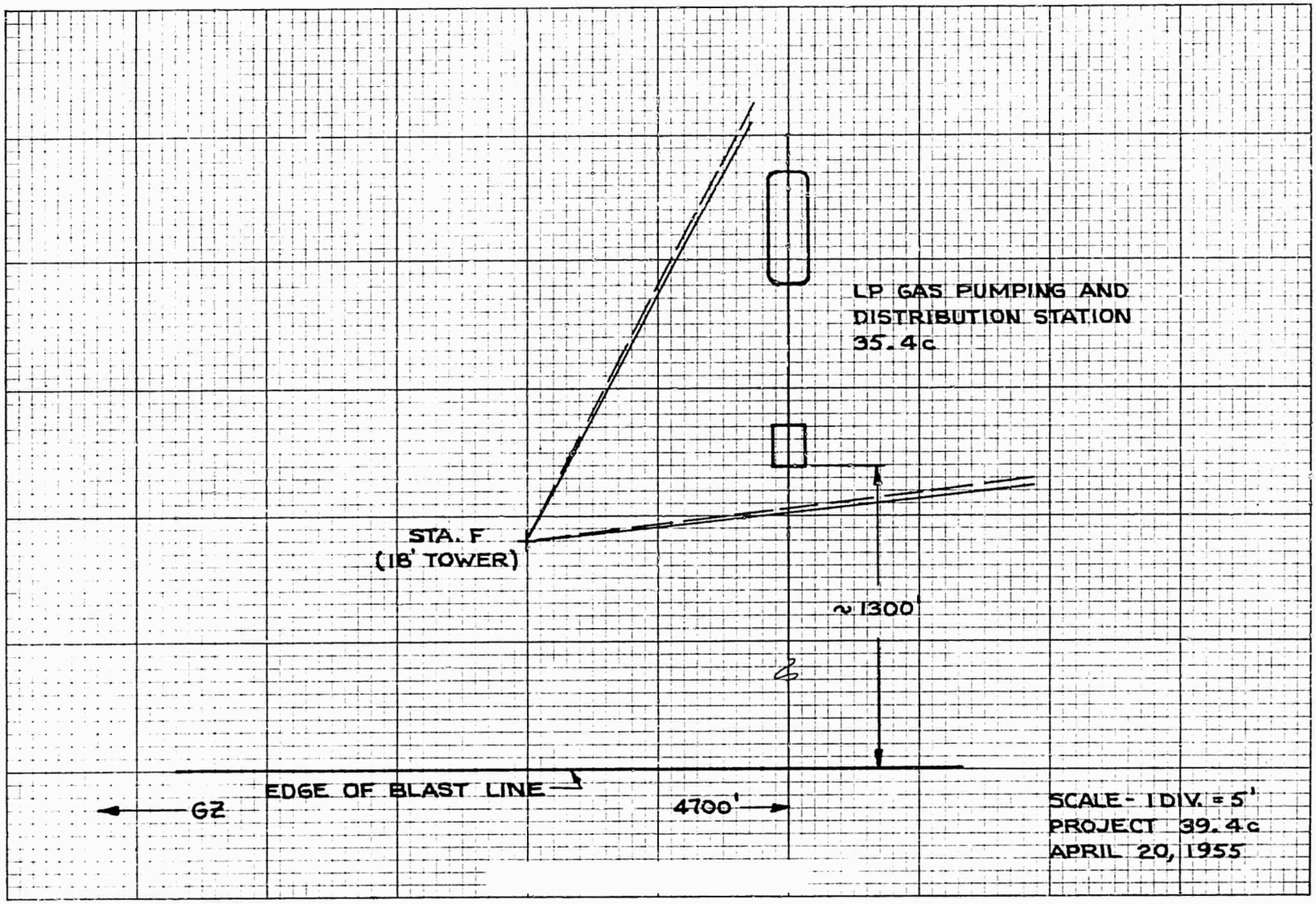


Fig. A-9 Photostation F

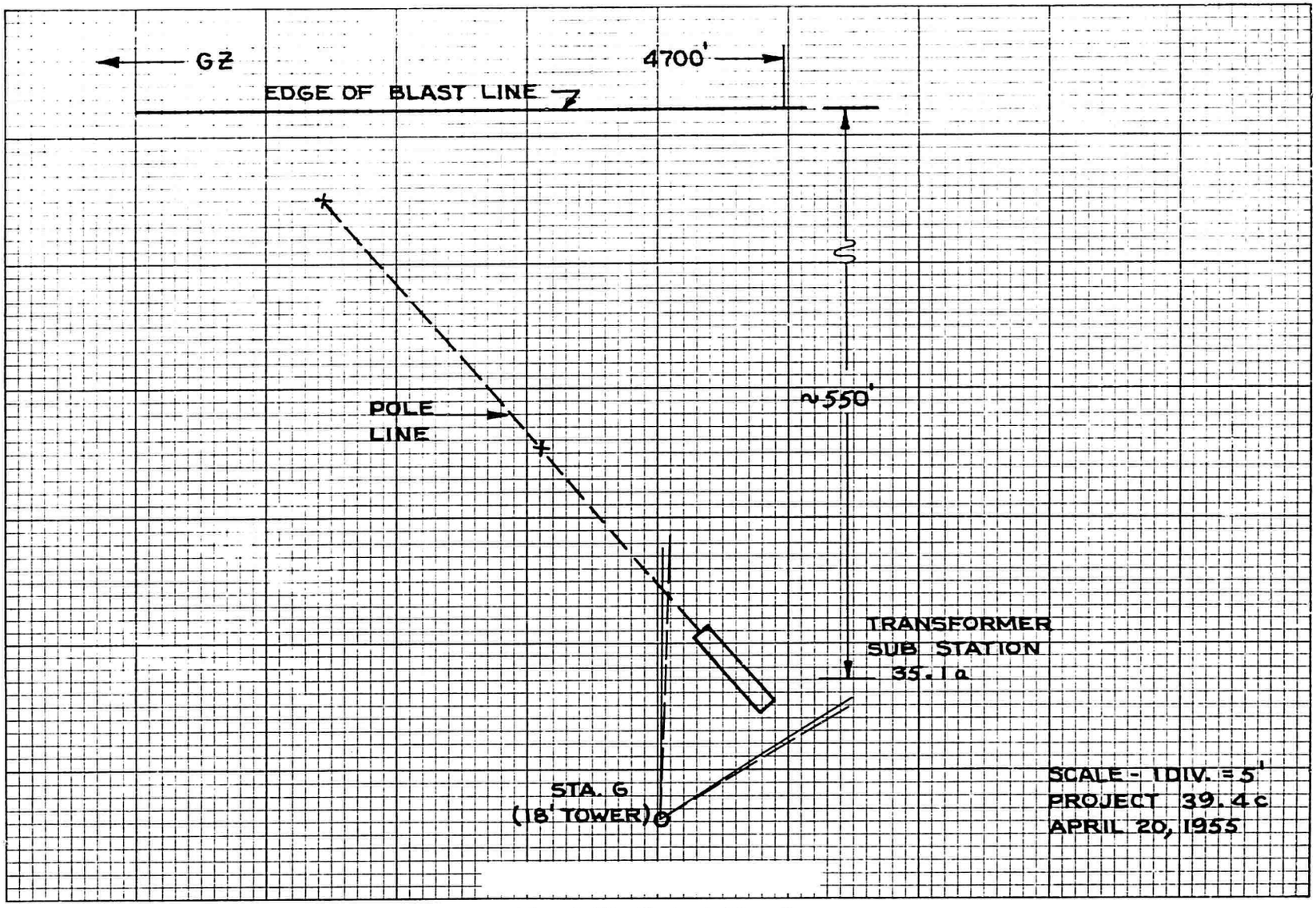


Fig. A-10 Photostation G

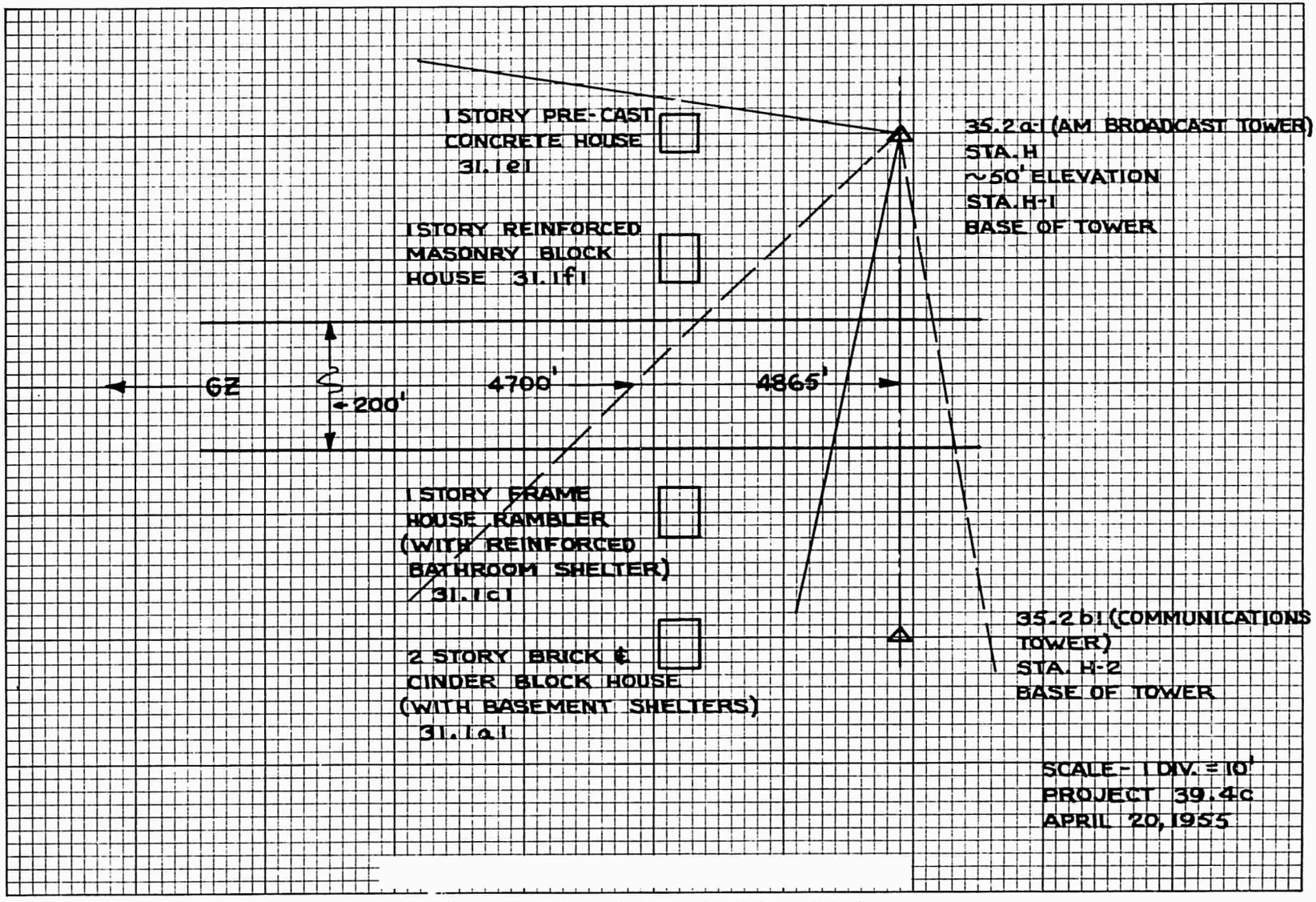


Fig. A-11 Photostations H, H-1, and H-2

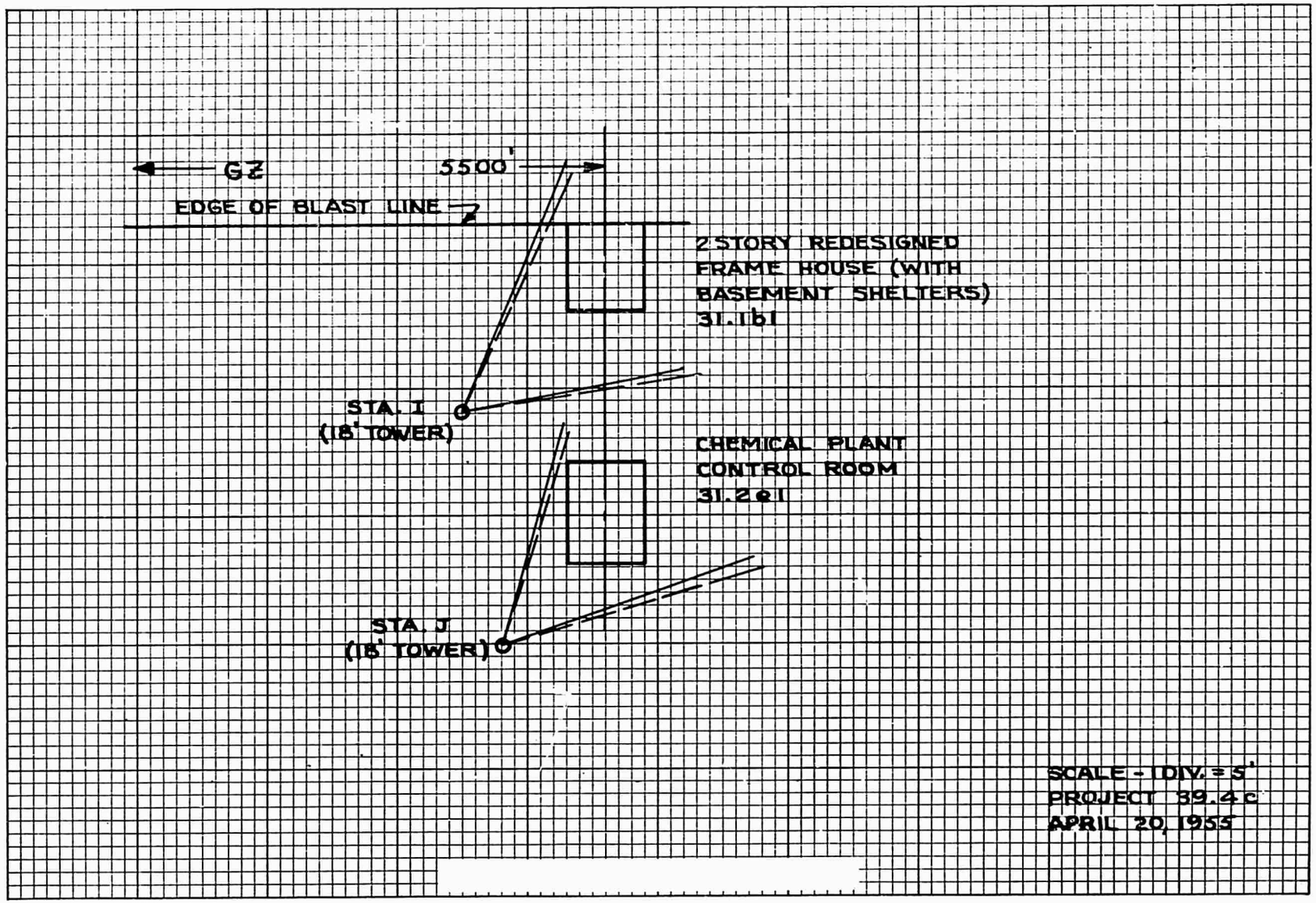


Fig. A-12 Photostations I and J

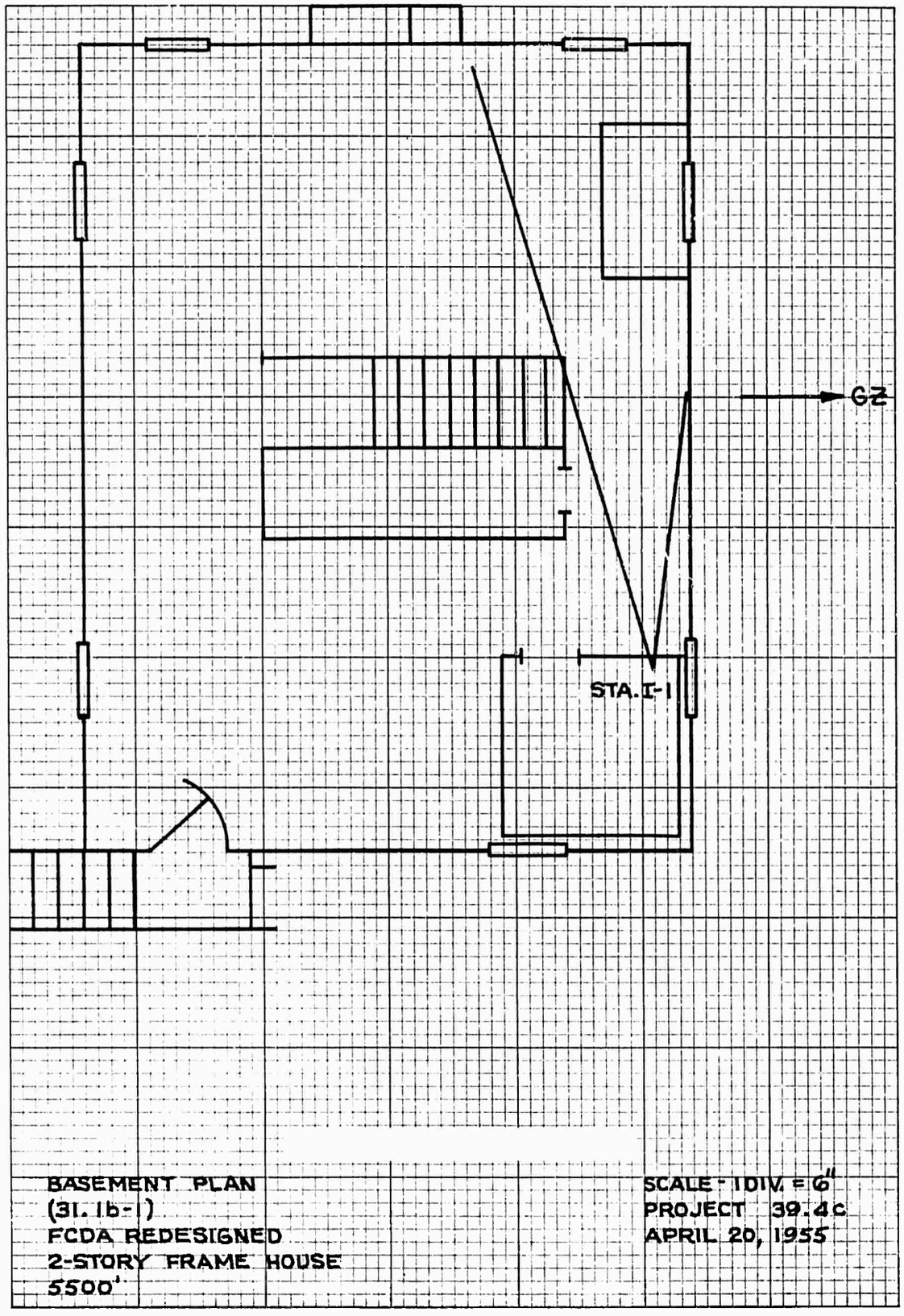


Fig. A-13 Photostation I-1

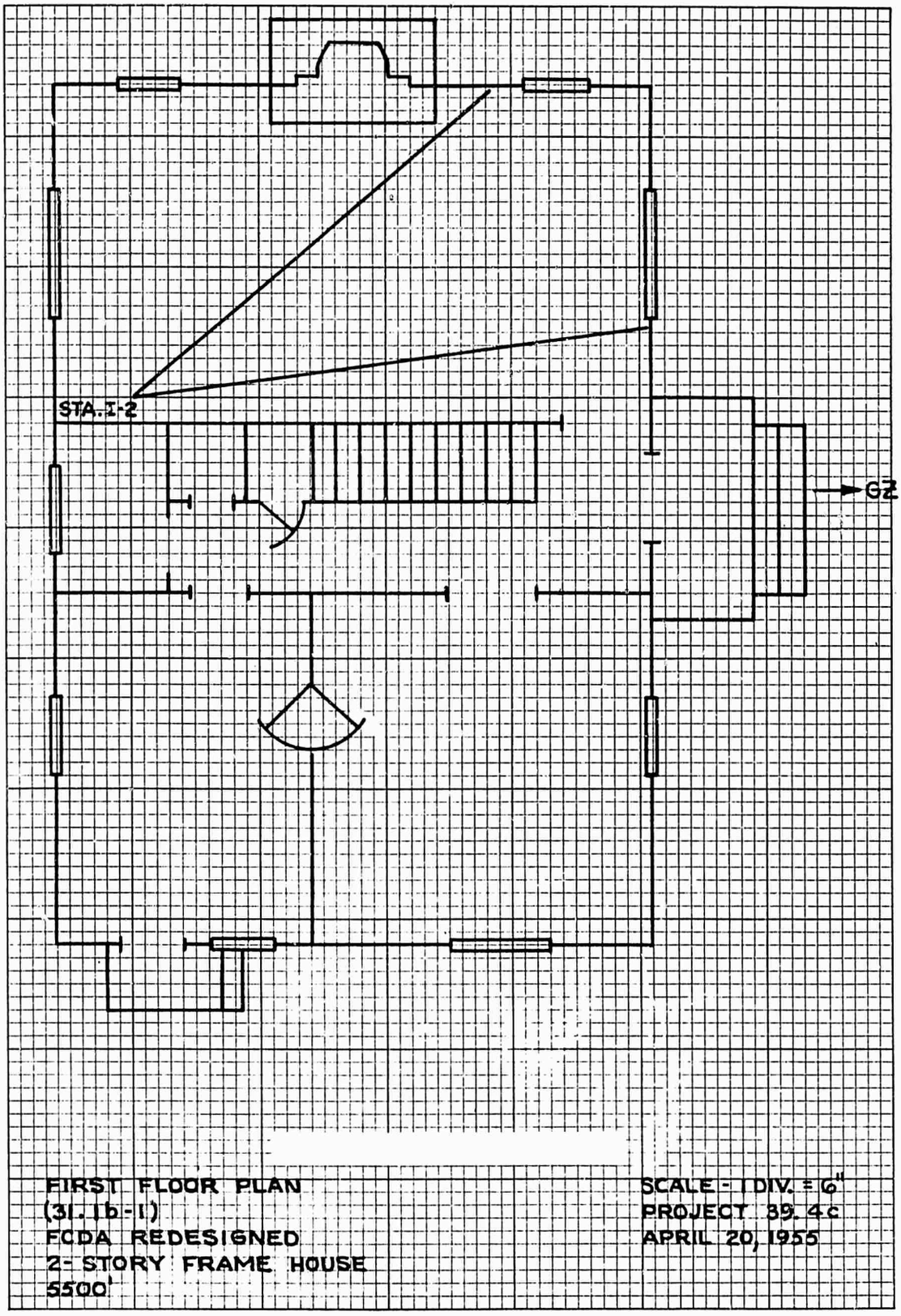


Fig. A-14 Photostation I-2

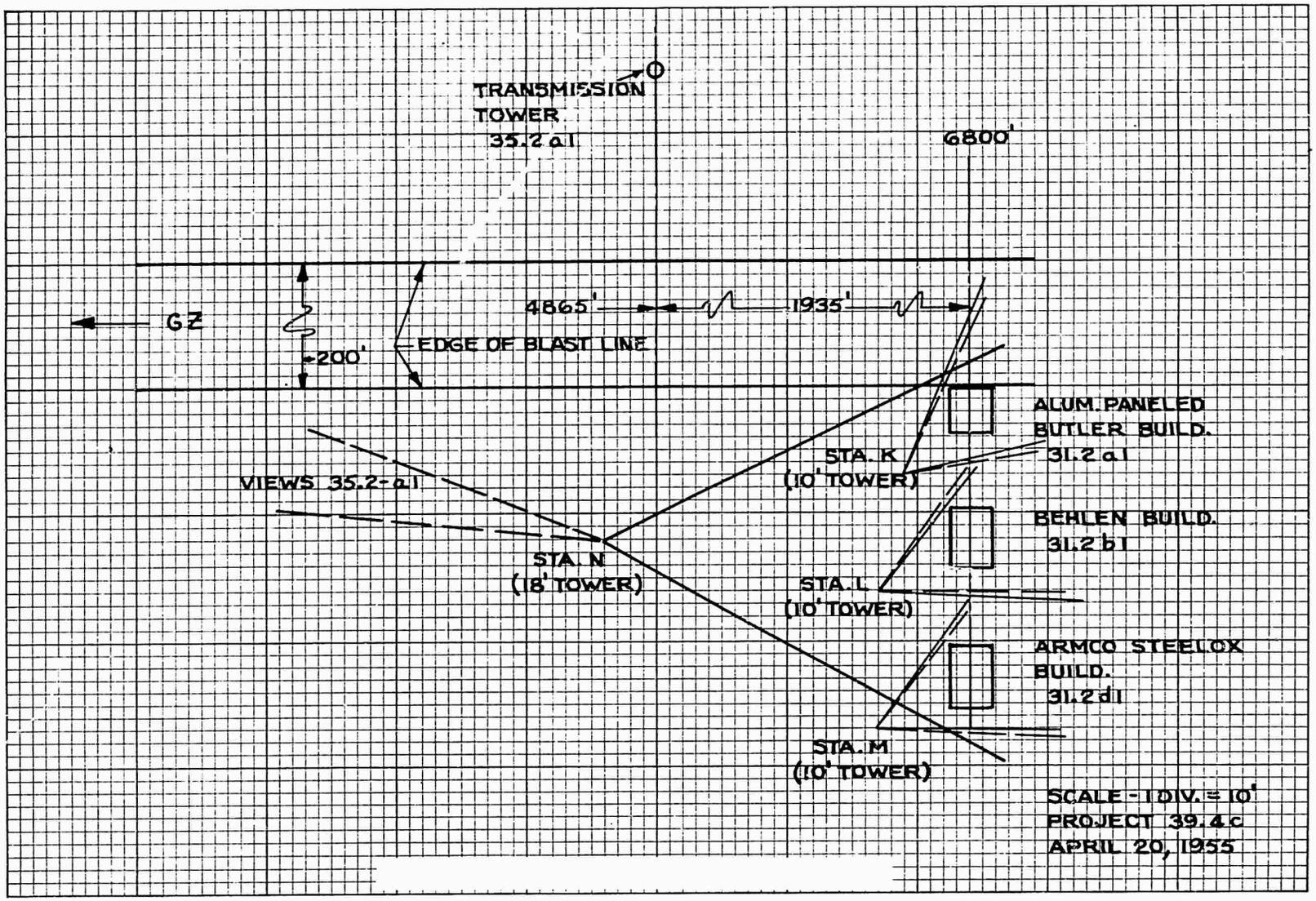


Fig. A-15 Photostations K, L, M, and N

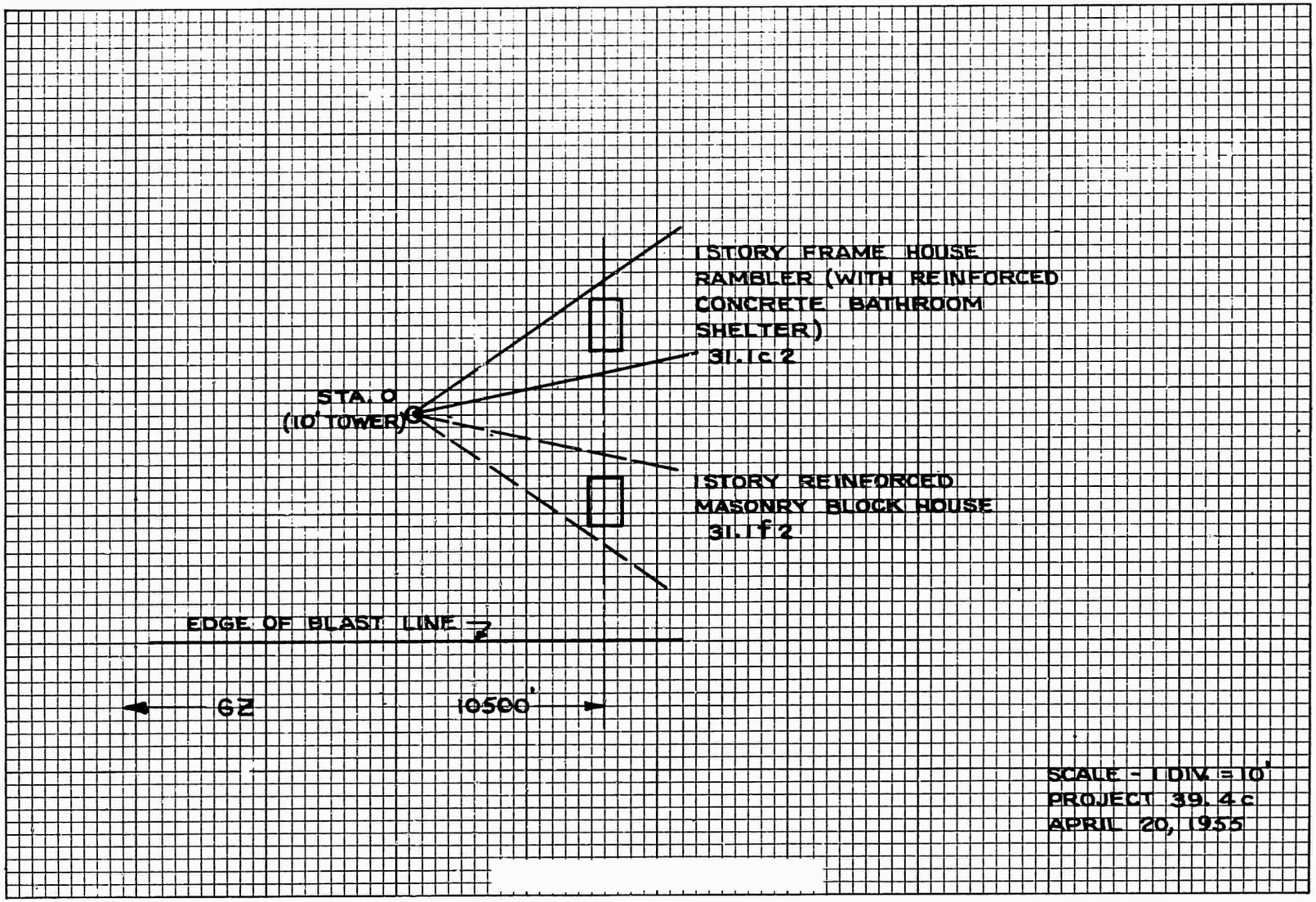


Fig. A-16 Photostation 0

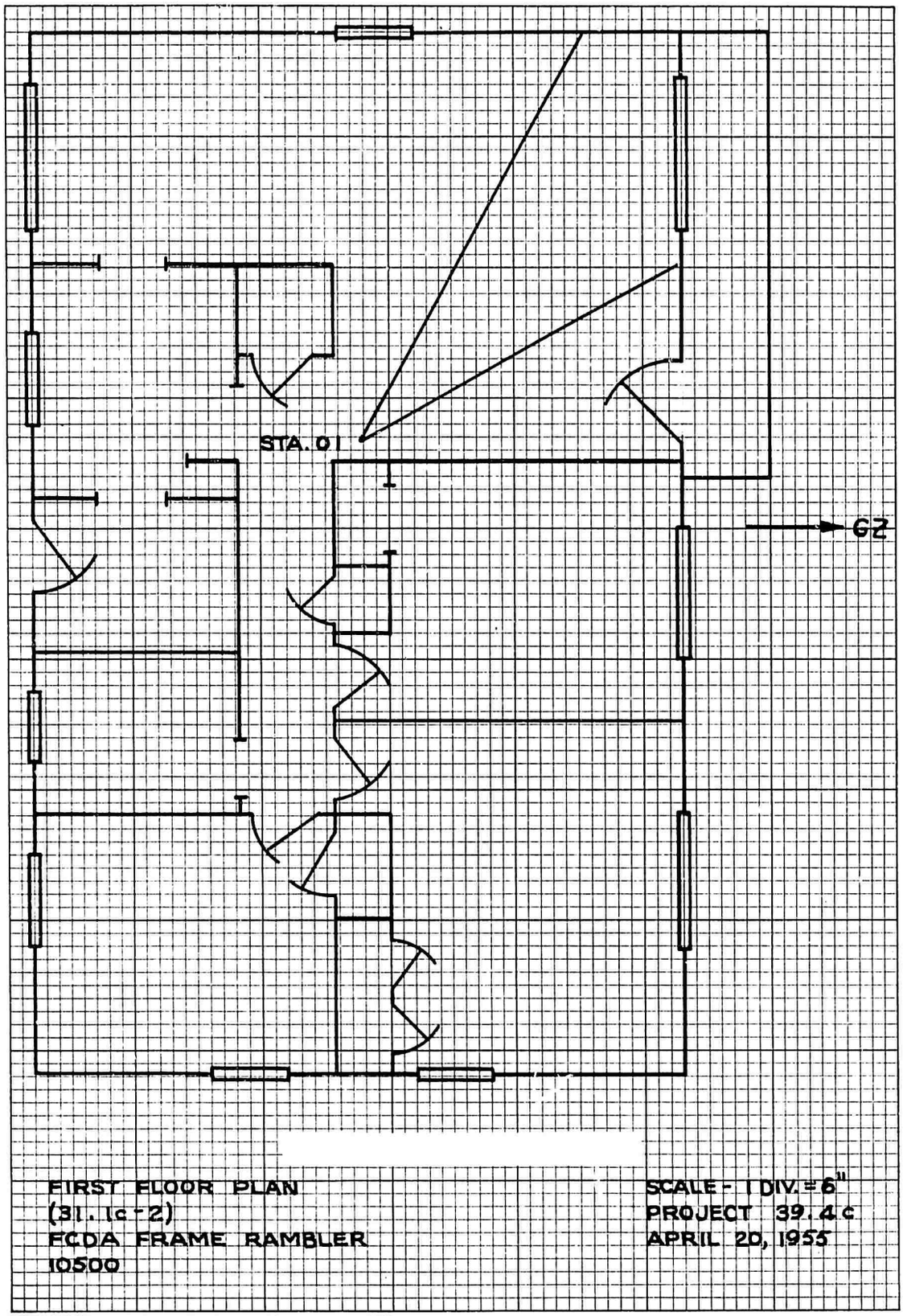


Fig. A-17 Photostation 0-1

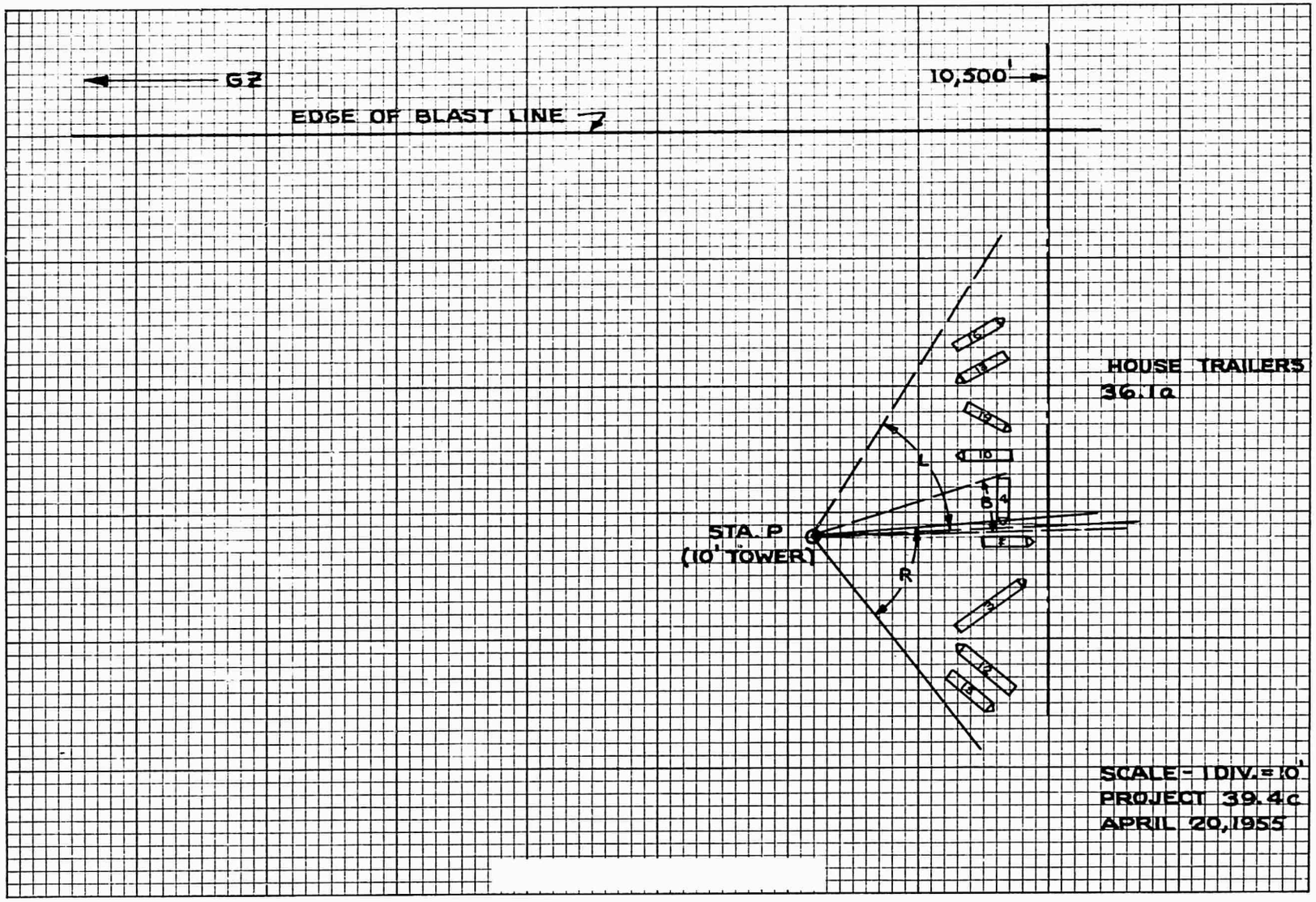


Fig. A-18 Photostation P

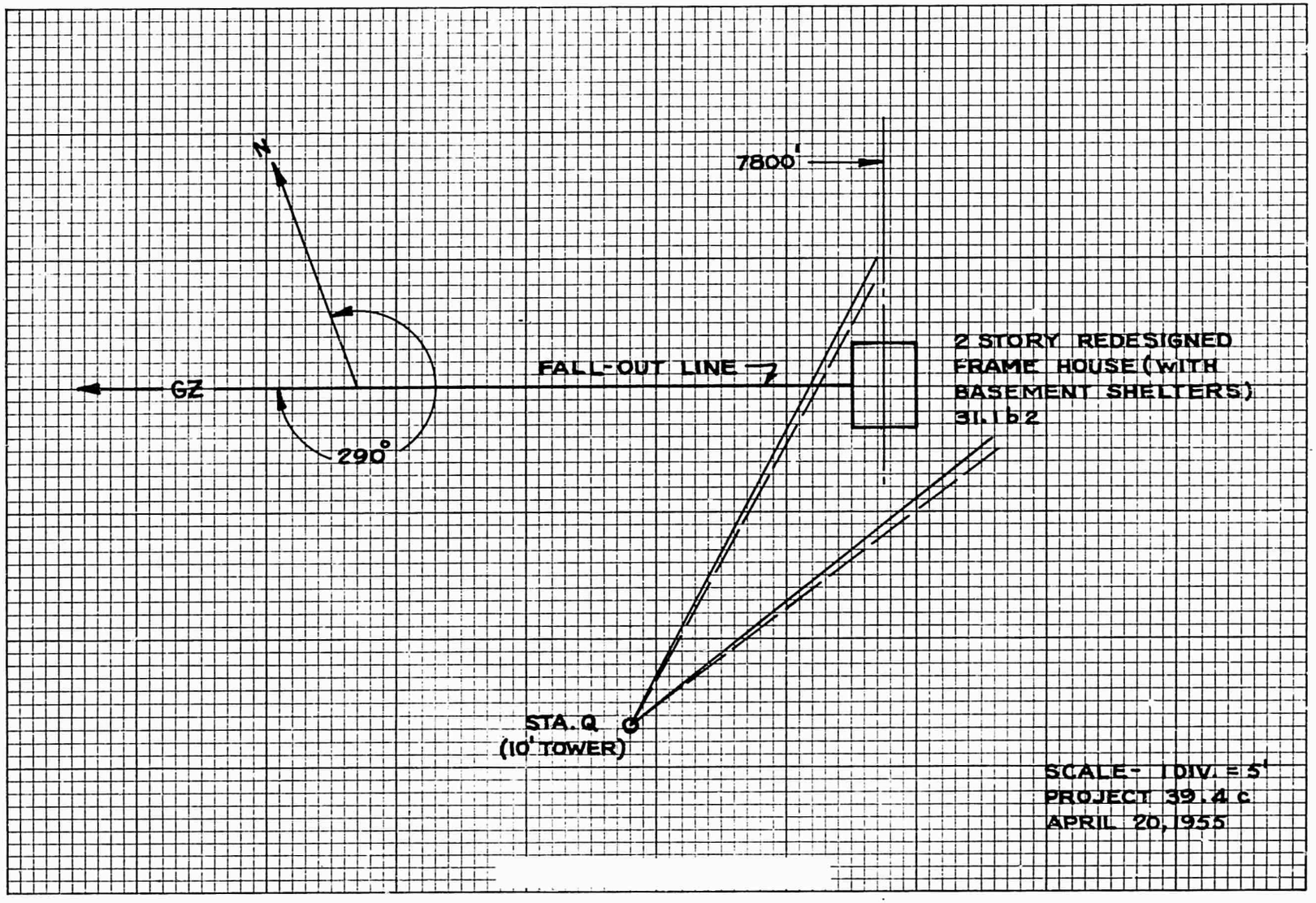


Fig. A-19 Photostation Q

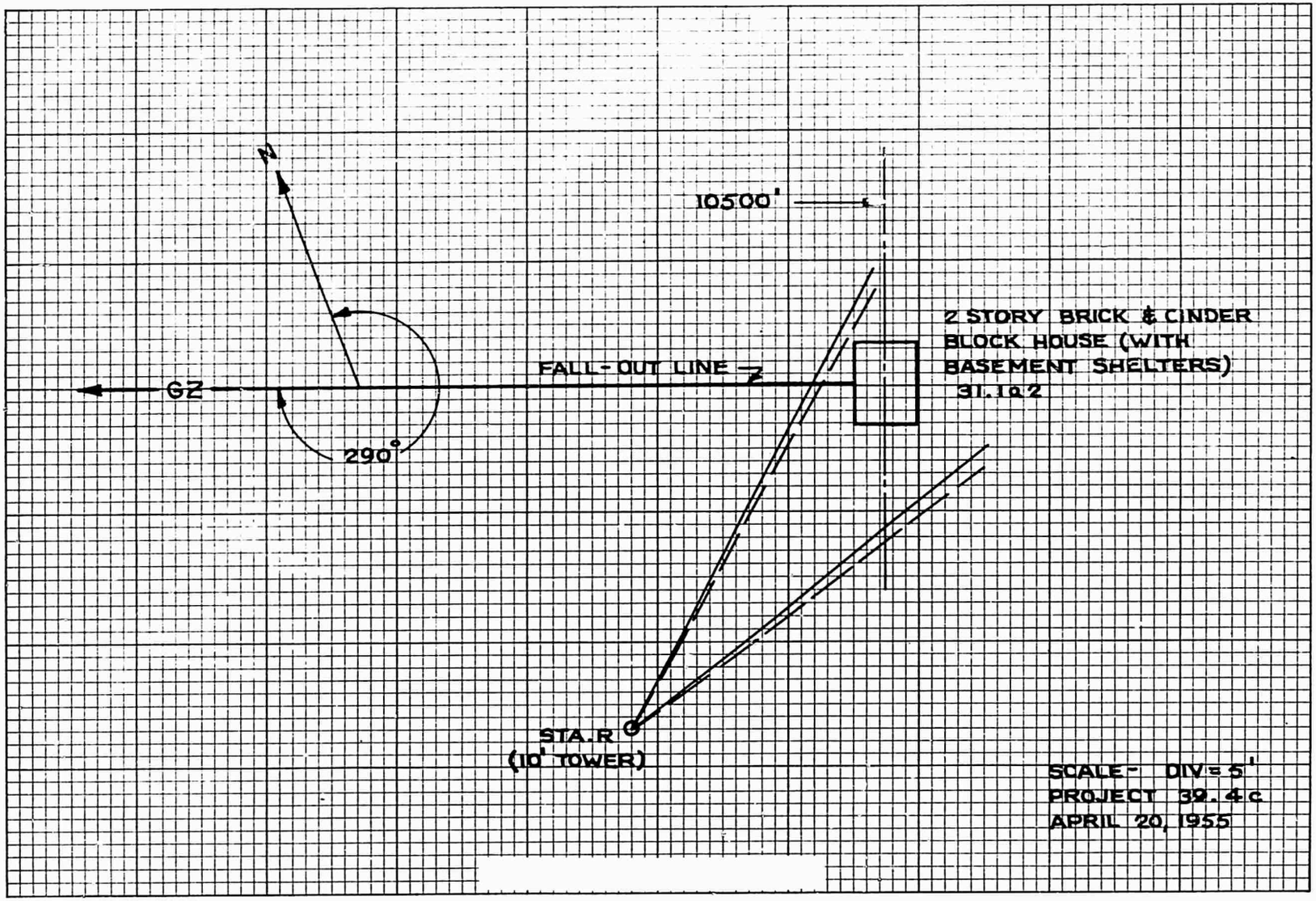


Fig. A-20 Photostation R

# APPENDIX B

# STATION LOADING SHEETS

# SPECIAL STATION LOADING SHEET
## OPERATION TEAPOT

SHOT *APPLE II* DATE *5-5-55*

| E.G.G. STA. | STA. LOC. | TOWER HEIGHT | LOADING GROUP | CAMERA NO. | CAM. POS. | SPEED FR/SEC. | AIMING VERT. | LENS f.L.(mm) | FOCUS SETTING | FILTER ND | FILTER W | APER. | EMULSION | FILM NO. | Pb | MARK. FREQ. | STA. SIG. | CAM. OPER. ON | CAM. OPER. OFF | LIGHTING VOL. | LIGHTING TYPE | LIGHTING NO. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 2750' | 10' | | GSAP 118 | L | 64 | -7°25' | 25 | 50' | - | - | 16 | MF 1112-3-04 | 29280 | 2½" | — | -5s | -2.5s | +75s | - | - | - | 34.1h UTILITY SHELTERS |
| ↓ | ↓ | ↓ | | GSAP 161 | R | 64 | 0°00' | 9.5 | ∞ | - | - | 8 | | 29281 | 2½" | — | | | | - | - | - | 34.1i, 34.1j " " |
| B | 4700' | 18' | | GSAP 175 | L | 32 | -7°35' | 9.5 | ∞ | - | - | 5.6 | | 29246 | 2½" | — | | | | - | - | - | 1 STORY FRAME HOUSE - 31.1c1 |
| ↓ | | ↓ | | GSAP 177 | R | 32 | -7°35' | 9.5 | ∞ | - | - | 2.8 | | 29247 | 2½" | — | | | | - | - | - | " " " " |
| B-1 | | 1st FLOOR | | GSAP 111 | - | 16 | +2°50' | 18 | 20' | - | - | 3.5 | | 29248 | 2½" | — | | | +2m | 36 | 4541-D 4541 | 5 10 | " " " " |
| C | | 18' | | GSAP 139 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | | 29247 | 2½" | — | | | +75s | - | — | - | 31.1a1 - 2 STORY BRICK & CINDER |
| ↓ | | ↓ | | GSAP 137 | R | 32 | 0°00' | 9.5 | ∞ | - | - | 2.8 | | 29249 | 2½" | — | | | | - | — | - | " " " " |
| C-1 | | BASEMENT | | GSAP 40 | - | 16 | -0°15' | 18 | 15' | - | - | 2.8 | | 29244 | — | — | | | +2m | 36 | 4541 4541-D | 5 4 | 31.1a1 CORNER SHELTER |
| C-2 | | 1st FLOOR | | GSAP 92 | - | 16 | -2°03' | 9.5 | 15' | - | - | 2.2 | | 29245 | 2½" | — | | | | - | — | - | " (FOIL REFLECTORS FOR ILLUM) |
| D | | 18' | | GSAP 123 | L | 32 | -6°38' | 9.5 | ∞ | - | - | 5.6 | | 29252 | 2½" | — | | | +75s | - | — | - | 31.1f1 ONE STORY REINFORCED MASONRY |
| ↓ | | ↓ | | GSAP 170 | R | 32 | -6°35' | 9.5 | ∞ | - | - | 2.8 | | 29253 | 2½" | — | | | | - | — | - | " |
| D-1 | | 1st FLOOR | | GSAP 112 | - | 16 | +1°30' | 18 | 18' | - | - | 3.5 | | 29254 | 2½" | — | | | +2m | 36 | 4541 | 15 | 31.1h VIEWS ELECTRONICS-SWITCHBOARD |
| D-2 | | ↓ | | GSAP 58 | - | 16 | +3°56' | 18 | 10' | - | - | 2.5 | | 29292 | 2½" | — | | | | 36 | 4541 | 7 | " " " AM BROADCAST STA |
| E | | 18' | | GSAP 173 | L | 32 | -7°15' | 9.5 | ∞ | - | - | 5.6 | | 29249 | 2½" | — | | | +75s | - | — | - | 31.1c1 1 STORY PRECAST CONCRETE |
| ↓ | | ↓ | | GSAP 132 | R | 32 | -7°45' | 9.5 | ∞ | - | - | 2.8 | | 29250 | 2½" | — | | | | - | — | - | " " " " |
| E-1 | | 1st FLOOR | | GSAP 95 | - | 16 | +2°00' | 18 | 15' | - | - | 2.5 | | 29251 | 2½" | — | | | +2m | 36 | 4541 | 10 | " " " " |
| F | | 18' | | GSAP 151 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | | 29287 | 2½" | — | | | +75s | - | — | - | 35.4c - LP PUMP & TANK |
| ↓ | | ↓ | | GSAP 166 | R | 32 | 0°00' | 9.5 | ∞ | - | - | 2.8 | | 29288 | 2½" | — | | | | - | — | - | " " |
| G | | 18' | | GSAP 136 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | | 29282 | 2½" | — | | | | - | — | - | 35.1a TRANSFORMER SUB STA. |
| ↓ | | ↓ | | GSAP 180 | R | 32 | +2°35' | 5.3 | ∞ | - | - | 2.8 | | 29283 | 2½" | — | | | | - | — | - | " " " |
| H | 4865' | ~50' | | GSAP 141 | UPPER | 16 | 0°00' | 9.5 | ∞ | - | - | 2.8 | | 29240 | — | — | | | | - | — | - | VIEWS ARRAY AT 470c - FROM 35.2a1 |
| ↓ | ↓ | ↓ | | GSAP 102 | LOWER | 16 | -6°29' | 5.3 | ∞ | - | - | 5.6 | | 29241 | — | — | | | | - | — | - | " " " " " |
| H-1 | | ~15' | | GSAP 84 | - | 16 | +88°42' | 18 | ∞ | - | - | 4 | | 29285 | — | — | | | | - | — | - | BASE OF 35.2a1 - VIEWS TOWER |
| H-2 | | ~15' | | GSAP 47 | - | 16 | +92°54' | 25 | ∞ | - | - | 1.9 | | 29286 | — | — | | | | - | — | - | " " 35.2b1 - " " |
| I | 5500' | 18' | | GSAP 126 | L | 16 | 0°00' | 9.5 | ∞ | - | - | 4 | | 29255 | 2½" | — | | | | - | — | - | 31.1b1 2 STORY REDESIGNED FRAME |
| ↓ | ↓ | ↓ | | GSAP 178 | R | 16 | 0°00' | 9.5 | ∞ | - | - | 2.8 | | 29256 | 2½" | — | | | | - | — | - | " " " " |
| I-1 | | BASEMENT | | GSAP 54 | - | 32 | -0°03' | 25 | 15' | - | - | 1.9 | | 29257 | — | — | | | | 36 | 4541 | 5 | " BASEMENT LEAN-TO SHELTER BASE LIGHTING |
| I-2 | | 1st FLOOR | | GSAP 85 | - | 32 | -2°43' | 18 | 20' | - | - | 5.6 | BX7230 258 | 29258 | 2½" | — | | | | 36 | 4541-D | 5 | " LIVING ROOM |
| J | | 18' | | GSAP 126 | L | 16 | +3°00' | 9.5 | ∞ | - | - | 4 | MF1112-3-04 | 29277 | 2½" | — | | | | - | — | - | 31.2c1 CHEM PLANT CONTROL ROOM |
| ↓ | | ↓ | | GSAP 91 | R | 16 | -19°00' | 9.5 | ∞ | - | - | 2.8 | ↓ | 29278 | 2½" | — | | | | - | — | - | " " " " " |
| K | 6800 | 10' | | GSAP 154 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | BX7230 258 | 29271 | 2½" | — | | | | - | — | - | 31.2a1 AL. BUTLER BLDG. |
| ↓ | ↓ | ↓ | | GSAP 163 | R | 32 | 0°00' | 9.5 | ∞ | - | - | 4 | ↓ | 29272 | 2½" | — | | | | - | — | - | " " " " |
| L | | 10' | | GSAP 128 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | | 29273 | 2½" | — | | | | - | — | - | 31.2b1 BEHLEN BLDG. |
| ↓ | | ↓ | | GSAP 167 | R | 32 | 0°00' | 9.5 | ∞ | - | - | 4 | | 29274 | 2½" | — | | | | - | — | - | " " " |
| M | | 10' | | GSAP 108 | L | 32 | 0°00' | 9.5 | ∞ | - | - | 5.6 | | 29275 | 2½" | — | | | | - | — | - | 31.2d1 ARMCO STEELOX |
| ↓ | | ↓ | | GSAP 140 | R | 32 | 0°00' | 9.5 | ∞ | - | - | 4 | ↓ | 29276 | 2½" | — | ↓ | ↓ | ↓ | - | — | - | " " " |
| | | | | | | | | | | | | | | | | | | | | | | | |

# SPECIAL STATION LOADING SHEET
## OPERATION TEAPOT

SHOT APPLE II DATE 5-5-55

| E.G.G. STA. | STA. LOC. | TOWER HEIGHT | LOADING GROUP | CAMERA NO. | CAM. POS. | SPEED FR/SEC. | AIMING VERT. | LENS (Lmm) | FOCUS SETTING | FILTER ND | FILTER W | APER. | EMULSION | FILM NO. | PL | % Δ Q. | STA. SIG. | CAM. OPER. ON | CAM. OPER. OFF | LIGHTING VOL. | LIGHTING TYPE | LIGHTING NO. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | 6800' | 10' | | GSAP 145 | L | 32 | -2°30' | 9.5 | ∞ | – | – | 4 | BX7230258 | 29270 | 2½" | — | -5s | -25s | +75s | – | – | – | ARRAY OF BLDGS. 31.2d1, 31.2b1, 31.2a1 |
| ↓ | ↓ | ↓ | | GSAP 130 | R | 32 | +2°00' | 40 | ∞ | – | – | 11 | BX7230258 | 29284 | ↓ | — | | | | – | – | – | 35.2a1 TRANSMISSION TOWER |
| O | 10,500' | | | GSAP 96 | L | 16 | 0°00' | 25 | ∞ | – | – | 1.9 | TRI-X 723326 | 29261 | | — | | | | – | – | – | 31.1c2 ONE STORY FRAME HOUSE |
| ↓ | | | | GSAP 4 | R | 16 | 0°00' | 25 | ∞ | – | – | 1.9 | | 29263 | ↓ | — | | ↓ | | – | – | – | 31.1f2 ONE STORY REINFORCED MASONRY HOUSE |
| O-1 | | 1ST FLOOR | | GSAP 88 | – | 32 | +3°04' | 18 | 18' | – | – | 8 | | 29262 | — | — | | -5s | | 36 | 4872<br>4541-D | 4<br>1 | 31.1c2 1ST FLOOR |
| P | | 10' | | GSAP 3 | bottom | 16 | 0°00' | 40 | 150' | – | – | 4 | | 29289 | 2½" | — | | -25s | | 36 | 4570 | 5 | 36.1a1 HOUSE TRAILERS - CLOSE-UP |
| ↓ | | ↓ | | GSAP 147 | L | 16 | 0°00' | 9.5 | ∞ | – | – | 2.2 | | 29290 | ↓ | — | | ↓ | | – | – | – | " " " WIDE ANGLE |
| ↓ | | | | GSAP 142 | R | 16 | 0°00' | 9.5 | ∞ | – | – | 2.2 | ↓ | 29291 | | — | | | | – | – | – | " " " " " |
| Q | 7800 | | | GSAP 35 | L | 16 | 0°00' | 25 | ∞ | – | – | 4 | BX7230258 | 29259 | | — | | | | – | – | – | 31.1b2 2 STORY REDESIGNED FRAME |
| ↓ | FALL OUT LINE | | | GSAP 77 | R | 16 | 0°00' | 25 | ∞ | – | – | 2.8 | ↓ | 29260 | | — | | | | – | – | – | " " " " |
| R | 10500' | | | GSAP 6 | L | 16 | 0°00' | 25 | ∞ | – | – | 1.9 | TRI-X 723326 | 29264 | | — | | | | – | – | – | 31.1a2 2 STORY BRICK AND CINDER |
| ↓ | FALL OUT LINE | ↓ | | GSAP 89 | R | 16 | 0°00' | 25 | ∞ | – | – | 1.9 | ↓ | 29265 | ↓ | — | ↓ | ↓ | ↓ | – | – | – | " " " " " |

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