

PROGRESS REPORT FOR PERIOD
AUGUST 1, 1961, THROUGH SEPTEMBER 30, 1961

REPORT TO PROJECT M - NO. ABA-26 (MP)
STANFORD UNIVERSITY SUBCONTRACT S-128
UNDER AEC CONTRACT AT(04-3)-363

October 11, 1961

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I. INTRODUCTION

This report, the sixth in the series submitted ~~as~~ partial fulfillment of Subcontract S-128 and the second one based on the extension thereof, presents a summary of progress of ABA work for the period of August 1, 1961, through September 30, 1961.

The subject contract has been extended without a change in scope. Work accomplished to date on each of the contract objectives and the work planned for the month of October 1961 are discussed below.

II. WORK ACCOMPLISHED

A. MASTER CONSTRUCTION PLAN

The Master Construction Plan as defined in the subject contract consists of a site plan, sizes and functions of buildings, sizes and sources of utilities, cost analysis, and design and construction schedules. The progress of work on these items is delineated below in terms of the various engineering and architectural categories.

1. Architectural: The architectural design effort is approximately 80 percent complete. A brochure, titled "Stanford Linear Accelerator M, General Development Plan, Conventional Facilities", has been completed and is in printing.

2. Civil: The civil engineering design effort is about 95 percent complete. This includes the following: site grading and fencing plan; road, parking and paving plan; sanitary sewer system; water distribution system; storm drainage plan; and natural gas system. Completion of planning for the water and sewer systems is held up pending policy decisions by Stanford and AEC.

3. Mechanical-Heat Transfer: The heat transfer design, including cooling water systems plot plan, cooling tower water system flow diagram, and

demineralized water system flow diagram is complete.

4. Electrical: The electrical engineering design completion depends upon decisions in regard to major power source, voltage levels, and overhead vs. underground lines.

5. Heating, Ventilating, Air Conditioning and Plumbing (HVAC): The HVAC design of heating system and compressed air system plot plans is complete.

6. Utility Instrumentation: The utility instrumentation design effort is approximately 80 percent complete. This includes the public telephone system block diagram; public address system block diagram; intercommunication system block diagram; fire detection and monitoring system block diagram; and cooling water control system flow diagram.

B. DESIGN OF BASIC ROADS, SITE GRADING AND UTILITIES

1. Roads: Entrance road location (from Sand Hill Road) is being negotiated with Menlo Park authorities. Grading studies for a road layout similar to that presented in the General Development Plan are in progress. Two alternate locations for the access road from Alpine Road are being studied. One route follows the project south boundary and the other one acts as a frontage road for the proposed Junipero Serra Freeway. This access road is not in FY '62 construction, but its location influences the project road net.

2. Utilities: Water supply system design (Title I) is about 40 percent complete. Agreement, in principle, has been given by Menlo Park to furnish Hetch Hetchy water to Project M at cost. Initial system would serve Project M and Sharon Heights portion of Menlo Park. Lines would be sized for future service to adjacent Stanford lands. Installation is contingent on Project M, Stanford, and Sharon Heights developers paying their allocated proportion of the initial

construction cost. Project M would not participate in the construction costs but would pay a connection charge in lieu thereof. The work schedule will depend upon reaching final agreement between the interested parties by mid-November.

Sanitary sewer and natural gas supply design (Title I) is about 40 percent complete. Tentative agreements with Menlo Park Sanitary District and with PG&E, respectively, are satisfactory, but further negotiations are being held in abeyance pending project authorization.

The electrical power services design, including 60 kv service, temporary 60 kv substation, project master substation, and 12 kv distribution system, is continuing. Schedules will depend upon resolving the routing of 60 kv lines and establishing the voltage-level of the "major power source". The question of overhead versus underground installation of the 220 kv and 60 kv transmission lines is yet to be resolved.

The designs for the initial (FY '62) hot water heating system and the compressed air system are about 20 percent complete.

C. TEST LABORATORY BUILDING

The revised Title I drawings were resubmitted to Project M in first part of August 1961. Re-revised drawings were submitted in late August.

Title II work in the form of drawings and specifications is progressing as follows: architectural 80 percent complete; structural 70 percent complete; heat transfer 95 percent complete; electrical about 65 percent complete; HVAC 75 percent complete; and utility instrumentation 80 percent complete.

D. ADMINISTRATION-ENGINEERING BUILDING

The Title I work is progressing as follows: architectural 30 percent complete; HVAC 10 percent complete; and utility instrumentation 65 percent complete.

This work consists of single-line drawings, outline specifications, design and construction cost estimates and schedules.

E. UTILITY BUILDING A

The Title I work is underway and progressing as follows: architectural 10 percent complete; HVAC 5 percent complete; and utility instrumentation 80 percent complete.

F. ENGINEERING STUDIES

Work continues on several engineering studies with progress as listed below:

1. Cross Section: Further studies are in abeyance to conform with present schedule which provides time for Project M systems development to further refine the detailed functional requirements of the accelerator housing, shielding, and klystron housing.

2. Special Shielding Materials Study: A study to summarize attainable information on availability, cost, chemical composition, and physical properties of special shielding materials is in progress. Target date for completion of a preliminary report is October 13, 1961.

3. Site Investigation: Tiltmeter study scope has not yet been defined. Initial portable tiltmeter study completed. USGS study not yet started. It is assumed that, depending upon usefulness of initial results, the tiltmeter study will continue throughout project life. Horizontal measurement study has been initiated; it will be repeated at intervals, depending upon findings of initial surveys. Concrete piers for the horizontal survey are now being constructed. Third vertical survey has been completed. It will be repeated at intervals depending also upon findings of this and other surveys. Ground water study is about to begin. The extension of study scope will depend upon initial results.

III. WORK PLANNED FOR OCTOBER

The following work is planned for the month of October:

A. MASTER CONSTRUCTION PLAN

One hundred and fifty copies of the project "General Development Plan" will be submitted to Stanford and the AEC. A project "Construction Operations Plan" will be completed and submitted.

B. DESIGN OF BASIC ROADS, SITE GRADING AND UTILITIES

The site improvement Title I work, for FY '62 construction, will continue. Additional studies concerning water supply will be performed. Hot water heating and compressed air systems design will continue. Utility instrumentation systems design will continue.

C. TEST LABORATORY

Title II work will be completed and submitted to Project M for review.

D. ADMINISTRATION-ENGINEERING BUILDING

Title I work will be completed and submitted to Project M for review.

E. UTILITY BUILDING A

Title I work will be completed and submitted to Project M for review.

F. ENGINEERING STUDIES

1. Cross Section: Studies concerning accelerator housing configuration will continue.

2. Special Shielding Materials Study: This study will be completed and an initial report submitted.

3. Site Investigation: Tiltmeter, trenching, horizontal survey, and _____

An extensive trenching and geological sampling and investigation program has been initiated.

4. Heat Transfer: The report on the Test Laboratory schematic design (ABA-10), and the report on the Test Laboratory outline specification for the heat transfer systems (ABA-11), have been revised and resubmitted.

5. Electrical: Work is continuing on the basic electrical design philosophy and on the relative factors involved in several different types of underground duct materials.

6. Heating, Ventilating, Air Conditioning and Plumbing (HVAC): Two studies, "Refrigeration Systems for Air Conditioning", Report ABA-23, and "Boilers, Fuels and Waste Heat Study", Report ABA-6A, were completed during this report period. A third report "Humidity in Accelerator Housing", ABA-25, is nearly completed.

7. Utility Instrumentation: The revision of Report ABA-5 "Accelerator Tube Demineralized Water System, Instrumentation and Control Study" was completed. The public address system study (ABA-18) is about 90 percent complete; the inter-communication system study (ABA-19) is about 60 percent complete; and the revision of fire detection system criteria (ABA-12) is about 60 percent complete.

8. Earthquake Design Criteria: The report by John A. Blume summarizing design criteria for the project site and structures was completed and received on August 3, 1961.

9. Visits to other Laboratories: The Technical Director visited the Zero Gradient Synchrotron Project, Argonne National Laboratory; Alternating Gradient Synchrotron Project, Brookhaven National Laboratory; Protron Synchrotron Project, Princeton, New Jersey; Alternating Gradient Synchrotron, CERN, Switzerland; and the Linear Electron Accelerator, Orsay, France, during August.

ground water studies will continue.

4. Electrical: Work will continue on the basic electrical design philosophy. AC power systems cost study (ABA-24) will be completed.

5. HVAC: The study of humidity in accelerator housing (ABA-25) will be completed.

6. Utility Instrumentation: The ABA reports Nos. 12, 18 and 19 will be completed.

G. PRESENTATIONS

Additional effort will be expended in assisting Project M with presentations to the Board of Trustees and others.

H. NEW BUILDINGS

1. Shop Building: Start schematics and design criteria.
2. General Services Building: Start schematics and design criteria.
3. Central Laboratory Building: Start schematics and design criteria.

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