State Highway: The proposed state highway, Route 239, crosses the Sand Hill site from northwest to southeast at about the center of the area. Preliminary studies and public hearings have been completed, and an approximate location for the freeway has been selected. This approximate alignment is shown on the location plan, Figure 11 and on Drawings ESH-3 and WSH-2. An overpass will be required for the highway at its intersection with the accelerator alignment.

Meetings were held with highway officials in which the compatibility and requirements of the highway and accelerator were discussed.

Acquisition of the necessary right-of-way for this road will be completed in about three years. Final highway grade and alignment will be adjusted to the location and elevation of the accelerator. (Appendix U) Pre-preliminary studies have been started on possible overpass designs. The highway and the accelerator appear to be compatible in all engineering aspects. The route may possibly be used to advantage for routing the power line and utility mains to the site.

San Francisquito Creek Flood Control Project: A proposed 100-foot-high earth dam on San Francisquito Creek, about 3500 feet south of the midpoint of the accelerator, (see Figure 11) is under study of the Corps of Engineers as a possible flood control measure. The reservoir created by the dam would also perform service in water conservation and possibly as a recreational area. The potential reservoir area extends back up San Francisquito Creek and into a broad tributary valley which is crossed by the proposed accelerator embankment at about the mid-length of the accelerator.

The crest of the dam is at elevation 302. Maximum water surface elevation in the reservoir in the 100-year project design flood would be 297 feet. The accelerator embankment crest is at 314 feet, but the toe of the embankment is at lower elevations, as low as 250 feet in its central valley. Since the embankment crosses the reservoir area at one point and lies along San Francisquito Creek in its western portion, the reservoir waters will stand against the accelerator embankment on occasion, particularly at the higher reservoir stages. In order to make the central valley area that lies north of the accelerator available for flood water storage as well as to provide for its normal drainage, a twin-barreled two-way culvert is installed through the embankment under the accelerator housing at this point. Another smaller valley to the west is provided with a single two-way culvert.

In those lengths of the accelerator embankment which are exposed to reservoir waters the slopes below elevation 275 are flattened to insure their stability with changing reservoir water levels. In addition, a filter layer of select material with heavy armor rock on top is placed on these slopes to prevent wave erosion.

The dam is constructed with an uncontrolled 9 foot by 9 foot conduit penetrating the dam at elevation 258 feet. Consequently, the water level in the reservoir cannot be maintained at any higher level, although it will rise to elevations of as high as 297 feet under the 100 year flood conditions because of the temporarily greater inflow. Studies by the Corps of Engineers show that, even with the occurrence of the 100 year storm, the reservoir water level will be at or above 275 feet for less than three days. Consequently, seepage of reservoir waters into the embankment is not expected to be a problem. End Station Target Building floor and yard elevations are at 265 feet which is lower than the elevations of higher stages of the reservoir. All of these yards are enclosed by high thick shielding earth embankments, but at the western end of the Sand Hill area the yards are adjacent to the reservoir, eliminating gravity drainage so that target yard storm sewer collection systems must be pumped during high water from unusual storms. The eastern Sand Hill area is outside the reservoir area and gravity drainage systems can be used if the target yards are at the eastern end of the alignment.

Losses in reservoir volume because of accelerator embankment are concentrated at the higher and consequently seldom-used storage levels. This loss in volume is approximately 490 acre-feet, or about 4 percent of the total storage volume of 12, 600 acre feet. This 490 acre feet is less than the 600 acre feet assigned by the Corps of Engineers design to sediment accumulation over the 50-year life of the flood control project. Comparison of these volumes suggests that storage loss because of the presence of the accelerator embankment is relatively insignificant.

The possibility of elastic deformation of the area because of variable loading by changing reservoir water levels has been considered by the soil mechanics engineering consultants. It is their opinion that deformation from this cause would be within operating tolerances.

The presence of the dam and reservoir will require certain additional costs for slope stability, for access of reservoir waters to severed storage areas, and for storm water disposal. These costs are set forth in the cost estimates. From all engineering aspects the dam and reservoir appear to be compatible with the accelerator project. A letter from the San Francisco District office of the Corps of Engineers, attached as Appendix R, indicates that the Corps of Engineers also believes the two projects are compatible in the engineering sense.

In addition to an evaluation of the engineering compatibility of the dam and reservoir with the accelerator project, a second major phase of the investigation involved a series of conferences with officials of agencies and jurisdictions directly concerned with the flood control project. These include the two counties, San Mateo and Santa Clara; the city of Menlo Park; and Stanford University. The various officials, with the exception of those from Menlo Park and Stanford, feel that the proposed dam is the best solution to the flood control problem. Their opinions are based on the results of Corps of Engineers studies. There are a number of procedural steps yet to be taken, including a vote of the residents of the affected flood control zones, who would have to bear a significant portion of the cost of the project unless present State laws are revised.

Under existing legislation the State of California cannot share in the flood control project cost. Therefore, residents of the affected areas would have to vote on a bond issue for their share of the cost of the flood control project. If the State Department of Water Resources is allowed and directed by legislative action to pay for some of the land acquisition and relocation costs, then the direct participation required of local residents would be reduced about eighty percent.

In addition to the local and state participation, the project still has to be authorized on a federal level. It is understood that a final draft report has been submitted on the project to Washington officials.

Stanford University has not yet committed itself to an official opinion. University spokesmen have expressed keen interest in the flood control project, both of itself and because of its relationship with the accelerator, but are withholding judgment pending the outcome of current studies. Menlo Park is officially on record opposing the flood control project as now planned.

Earthquake Risk

An extended discussion of general aspects of the earthquake risk problem was presented in Volume I of the Blume Report, supplemented by more specific consideration of the various sites in Volume III. The major factors involved are: the earthquake-resistant design objective that the accelerator not be damaged beyond repair by earthquakes of less-than-catastrophic intensity, the relatively shock-insensitive nature of the accelerator components, and the geologists' conclusion that no active faults cross the accelerator alignment. It was concluded that the necessary energy attenuation can be obtained with proper design procedures at little additional cost.

Subsequent geological and seismological investigations and analyses of the Sand Hill site, as part of the current study, confirm this earlier conclusion. Of the two alternate end station locations, the east end is preferable, both geologically and seismologically. Geologically the superior foundation materials at the east end are preferable for the target buildings with their high floor loads. Slope stability would also be considerably greater at the east end. From the seismological point of view, the greater distance of the east end from the San Andreas fault, which runs west of the site, makes it a more desirable location for the end station area.

It has been estimated that regional strain accumulation because of slow crustal deformation may result in a slight horizontal deviation from absolute linearity along the length of the accelerator, amounting to about 2 centimeters in a 10-year period. (Appendix Q) This displacement is within the tolerances listed in Table XXI-2 and can easily be compensated for by adjustment of the steering magnets. Such movements can be detected by a program of instrumental observation after construction.

Design procedures used are in accordance with experienced design practice on the seismically-active Pacific coast. These techniques have been used for structures of greater sensitivity and cost than the accelerator. Some of these structures also present a major potential hazard to human life in the event of failure, which is not a characteristic of the accelerator.

Some examples of these design procedures are noted following. Stability against movement because of earthquake shock is incorporated in the designs of the earth embankments. This is accomplished by restricting slopes to the values stipulated for the various earth materials encountered in cuts or used in fills, benching cut and fill slopes at prescribed vertical intervals, placing material at carefully specified relative compactions, and constructing stepped or serrated intersections between fill embankments and existing slopes. Compressible surface soils are stripped in several locations and replaced with compacted select materials. Foundation and shielding fills are likewise composed of carefully selected materials, compacted to stipulated densities. Cut and fill slopes are stabilized by planting. Drainage necessary for the stability of slopes and fills is provided by intercepter ditches at the tops and bases of slopes and on benches, and by subdrains along the klystron building wall and under the accelerator housing floor.

The design of the accelerator housing has been adapted from sections used successfully in tunnels subjected to heavy pressures. Consequently it affords a high measure of security for the accelerator itself. The wave guides at 10-foot intervals between the acclerator and klystron housings are routed through oversize metal pipes, which both protect the wave guide and also allow for possible differential movement between the surrounding fill and the waveguide itself without damage to the waveguide.

The klystron tubes are contained in cubicles with construction similar to that of heavy electrical equipment and panel boards, and are consequently relatively insensitive to shock. The design of other equipment items and structures incorporates seismic resistance to the maximum degree possible which is consistent with the requirements of economy.

The conclusions of Volumes I and III that the required seismic resistance and shock attenuation can be attained at little additional cost and that the proposed site is feasible, from the standpoint of earthquake risk, for the construction of the accelerator are confirmed and reiterated here. Location of the end station at the east end of the proposed alignment will minimize risk of earthquake damage, but either site can be satisfactorily utilized for the end station development.

Sources of Data

Publications which provided data for this study are the "Proposal for a Two-Mile Linear Electron Accelerator," April, 1957, by Stanford University; "Review of the Stanford Proposal for a Two-Mile Linear Accelerator," June, 1958, by William M. Brobeck & Associates; the May, 1959 and 1960 "Construction Project Data Sheets" for the Linear Electron Accelerator, Stanford University, by the Divisions of Research, Finance, and Construction and Supply of the Atomic Energy Commission; the minutes of the hearings before the Subcommittees on Research and Development, and Legislation, of the Joint Committee on Atomic Energy, of the Eighty-Sixth Congress of the United States, on July 14 and 15, 1959; Volumes I, II and III of the "Report on the Proposed Stanford Two-Mile Linear Electron Accelerator at Alternate Sites," January, 1960, by John A. Blume & Associates, Engineers; the Joint Committee on Atomic Energy Report No. 1277, dated April 19, 1960; and the "Project M Source Book" presently being compiled by Stanford University.

Topographic, soils, and geologic data were developed as part of the scope of work, and have been furnished to the AEC and Stanford University. Data on utilities have been furnished by pertinent utility companies and districts and by Stanford University. Information on accelerator design revisions and changed project requirements has been provided by Stanford University. Data on the proposed highway have been furnished by District IV of the State of California, Division of Highways, and on the proposed San Francisquito Creek Flood Control Project by the Corps of Engineers, U. S. Army Engineer District, San Francisco.

VOLUME IV

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SECTION XXI

STANFORD CUT-AND-COVER SITES GENERAL PROJECT REQUIREMENTS

Functional Requirements

The functional requirements for the project are as follows: (a) the electron beam is produced in a 10,000-foot-long, straight accelerator tube which is tangent to the earth's surface ("level") at the target end, and is housed throughout its length in a structure with a minimum of 35 feet of transverse earth shielding; (b) klystron tube power sources for the beam are housed in a structure parallel to the accelerator housing but separated from it by 35 feet of earth shielding with R-F power transfer lines (wave guides) between the structures every 10 feet, and access passageways every 333-1/3 feet; (c) at the 10,000-foot point the beam enters a beam switchyard area, with branches leading to target buildings, and with stubbed-off extensions for future additional target area development; (d) two target buildings are provided initially (space is allocated for future development), with movable shield material, handling facilities, a beam disposal pit, and associated yard areas and perimeter earth embankments for shielding purposes; (e) associated research, development, maintenance, and administrative activities are conducted in building groups located near the target areas; and (f) necessary utilities are brought to the site and distributed as required.

Operational requirements include limitations on differential settlement of structures as set forth under Structure Requirements in this section of the report. In this same field of earth movements and their effects on the accelerator, earthquakes have been considered. A design objective has been that the accelerator not be damaged irreparably within the life of the project by earthquakes of less-than-catastrophic insensities.

The two proposed alignments considered are shown on Drawings ESH-3 and WSH-2. Other drawings in Sections XXII and XXIII show proposed center station and end station area layouts and details of structures and buildings.

Principal Machine Parameters

The principal machine parameters for the accelerator set forth below are essentially the same as listed in Volume III.

TABLE XXI-1

PRINCIPAL MACHINE PARAMETERS

	Stage I	Stage II
Beam Energy (10% Beam Loading)*	10-20 Bev	20-45 Bev
Accelerator Length	10,000 feet	10,000 feet
Pulse Repetition Rate (Max.)	360 pulses/sec	360 pulses/sec
R-F Pulse Length	2.5 microsec	2.5 microsec
Operating Time	24 hrs/day	24 hrs/day
Number of Klystrons	240	960
Power Output per Klystron	6-24 MW	6-24 MW
Expected Average Klystron Life	2000 hours	2000 hours
Number of Klystrons to be Repaired per Month	90	360
Maximum Operating Load	48.9 MVA	133.2 MVA

(Continued next page)

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* Maximum unloaded beam energies in Stages I and II are 22.5 Bev and 45 Bev respectively.

PRINCIPAL MACHINE PARAMETERS (Continued)

Installed Electrical Capacity (Main Transformer Bank Capacity)	75 MVA	150 MVA
Frequency	2856 MC/sec	2856 MC/sec
Gun Pulse Length	0.01-2.1 microsec	0.01-2.1 microsec
Gun Injection Voltage	80 Kilovolts	80 Kilovolts
Peak Beam Current	25-50 Milliamp	50-100 Milliamp
Average Beam Current	15-30 Microamp	30-60 Microamp
Average Beam Power	0.15 MW	0.6 MW
Maximum Beam Duty Cycle	$\frac{1}{1300}$	$\frac{1}{1300}$
Energy Gradient	1-2 Mev/ft	2-4.5 Mev/ft
Maximum Shield Requirements		
(a) Transverse	29 feet of earth	29 feet or earth
(b) In-Line	45 feet of earth	45 feet of earth
Accelerator Housing Cross Section	12' x 12' horseshoe	12' x 12' horseshoe
Klystron Housing Cross Section	20' wide x 20' high	20' wide x 20' high
Separation between Accelerator and Klystron Housings	35 feet	35 feet
Number of Developed Beams	2	2
Beam Energy Capacity of Swithyard Magnets	25 Bev	45 Bev

Structural Requirements

Project buildings and structures are essentially unchanged, except for the End Station target buildings. The single large target building, described in previous volumes of the Blume Report, has been replaced with two smaller buildings, one of which is 120 feet wide and 300 feet long, and the other 120 feet wide and 100 feet long. Typical sections through these buildings are shown on Drawing ESH-7. These buildings are steel frame structures. Each is provided with a traveling crane, of 100 ton capacity, spanning the width of the building.

A beam dump pit is located in front of the larger building. Sections through the dump pit are shown on Drawing ESH-7. The traveling crane runway is extended to provide crane coverage for the movable shielding blocks at the building end of the dump pit. Blocks at the top are above the reach of this building crane and will have to be handled by a truck crane operating from the top of the adjacent earth fill.

A similar beam dump pit is provided inside the smaller target building. The beam path leading to this small building traverses a 150-foot-long concrete target chamber in front of the building.

Differential settlement tolerances for accelerator structures are as set forth on page IV-4, Volume I - Blume Report. They are listed again in the following table for convenience:

TABLE XXI-2

PROJECT ALIGNMENT TOLERANCES

Unit	Dimension	Time	Total Differential Settlement Allowed
Accelerator Housing	10,000 feet long	Life of Project (10 to 20 years)	2 feet
Overall beam length	About 12,000 feet long	1 year	1 inch±
End Station Buildings	120 feet by 100-300 feet	Initial consolidation period (2 years)	3 to 4 inches
		Experiment life (1 month or more)	1/8 to 1/4 inch
Beam Switchyard	About 1000 feet long	Life of project (10 to 20 years)	6 inches
		1 month	1/2 inch

For the present study settlement has been kept within the stipulated limits by founding the accelerator on rock where practicable and by specifying careful and thorough construction measures in those areas where fill is required. These measures include stripping deep topsoil layers and replacing with select material compacted at optimum conditions.

The accelerator and klystron housings are surface-constructed units. The accelerator housing is constructed of reinforced concrete with a horseshoe-shaped cross section 12 feet high and 12 feet wide, and is covered with a minimum of 35 feet of earth fill.

The klystron housing is 20 feet wide and 20 feet high in cross section. The building is separated from the accelerator structure by the intervening 35 feet of earth fill, with pipes for placing the wave guides between the two structures at 10 foot intervals, and cross-connecting passageways at 333-1/3 foot spacing. The klystron housing floor level is elevated above that of the accelerator. The klystron housing has a steel frame with metal roof decking and composition asbestos wall panels or sliding doors. Sections through the accelerator and klystron housings are shown on Drawings ESH-8 and ESH-14. Fire walls are provided in each sector with a fire-resistant ceiling suspended below the electrical cable racks which run the length of the housing and are located above the klystron cubicles.

The klystron housing is an enclosure for the klystrons and associated utility lines and equipment. The housing will be occupied only briefly, and at isolated points, by maintenance crews making replacements of klystron modulator cubicles. The cubicles and their accessories require an 11-foot width of floor space on the accelerator side. The remaining floor width provides an aisle and clear working space. The exterior wall is made up largely of a continuous row of sliding panels, for easy straight-in access to the cubicles. The panels can also be opened to provide local ventilation and cooling for maintenance crews replacing defective cubicles. An adjacent service road parallels the klystron housing length. Modulators can be removed or installed in the klystron housing with fork lift trucks. The forklift truck, still carrying a modulator, can be transported to and from the repair shops by larger trucks. Unnecessary rehandling of the modulators can thus be avoided. Suitable covers can be provided for the trucks during inclement weather to keep the modulator equipment dry.

The utilities are arranged on a sector basis. Water-circulating and vacuum pumps, heat exchangers, and electric power panels for serving a sector will be grouped in alcoves at 333-1/3 foot intervals. These alcoves are 40 feet long by 20 feet wide and project out from the side of the klystron housing opposite the access passageways to the accelerator.

These access passageways are rectangular in section, 5 feet wide and 7 feet high, and are constructed of reinforced concrete. A typical access passageway cross section is shown in Drawing ESH-8. The passageway leads off from the accelerator housing at an angle of 100° to the direction of the beam, to minimize the entrance of forward-scattering particles into the passageway. The straight length of the passageway terminates in a short stub-end radiation trap directly below the klystron alcove. A vertical shaft with an enclosed ladder provides access to the alcove. Key-interlocked gas-tight doors in the passageway and at the top of the vertical shaft prevent accidental entrance to the accelerator while the beam is in operation. Utility lines from the klystron housing and alcove to the accelerator tube are supported on one wall of the passageway and are boxed into door frames.

The earth fill shielding for the accelerator is constructed of site material, compacted in place, with subsurface drainage as required. Planting of the slopes and a surface drainage system prevent erosion. Cut and fill slopes elsewhere are similarly stabilized.

In the beam switchyard, the accelerator housing branches to provide several beam paths. The floor level is depressed 2 feet below the level of the preceding 10,000-foot length, but the ceiling level is maintained. The housing is enlarged at beam-deflection points to provide space for the deflecting magnets.

Earthwork

The fundamental earthwork design objective has been to establish stable cut and fill slopes embodying earthquake resistance equivalent to or better than that of other project structures or to natural slopes. Because of the large investment represented by the accelerator, aseismic stability has been emphasized, although economy of construction has also been a major consideration.

In areas where cut is required, the slopes used are those which have been established as being stable for the materials concerned.

Excavation slopes are benched at 30 foot vertical intervals. Intercepting and collecting ditches are located on the cut slopes with asphalt-paved gutters at the toe to carry storm water runoff to the nearest natural drainage channel.

In areas requiring fill, compressible surface soil layers are stripped to varying depths, dependent on soil conditions, to minimize differential settlement under the weight of the overlying fill. Select fill material is placed and compacted to 95 percent of maximum modified AASHO density. The subgrade for the klystron service road is similarly compacted.

The accelerator housing floor level is approximately 25 feet below that of the parallel klystron housing. The housing is constructed on a pervious fill base with subdrains, and the space between the housing and the walls of the trench is backfilled with gravel. Groundwater is conducted through these permeable filters to perforated drain tiles paralleling the outer edges of the floor slab.

Shielding earth material is backfilled and compacted over the completed housing. As the fill depth increases, inclined trenches are excavated for the pipes through which wave guides will transmit R-F power from the klystrons to the beam. The pipes are then placed and the trench is backfilled. Ducts for exhaust fans are installed in a similar manner. Shielding fill is compacted to 90 percent of maximum modified AASHO density. Surface runoff collection systems similar to those noted for the cut slopes are specified for the fill slopes. All slopes are also planted for slope stabilization.

Building and Utility Areas

Building sizes and space allocations are not changed appreciably from the requirements discussed in Volume III. The large End Station Building has been replaced by two small buildings, and the Fire Station is incorporated into the General Services building.

The remaining buildings in the end station area are not changed. Building areas with specified requirements are set forth in Table XXI-3.

TABLE XXI-3

DESCRIPTION OF BUILDINGS AND STRUCTURES

Structure		Size	Type	Special Requirements
a. End Station Buildings		36,000 Sq. ft. & 12,000 sq. ft.	Steel frame, Corrugated metal insulated siding	100/15 ton crane in each building.
b. End Station Lab. and Office			Steel frame, corrugated metal insulated siding	Research Lab. and Radio frequency room air conditioned.
Office	5,000			
Observation	8,000			
Storage	3,000			
Machine Shop	9,000			
Research Labs:				
Physics	10,000			
Electronics	6,000	41,000 sq. ft.		
c. General Services:				
Shops	8,000			
Stores & Rec.	5,000		Concrete block walls, * steel frame	
Garage	1,000			
Fire Station	2,000	16,000 sq. ft.		
d. Klystron Laboratory			Concrete block walls* steel frame	Clean room, air conditioned.
Klystron test stands	8,000			
Klystron fabrication & assembly	15,000			
Test Laboratory	13,500	36,500 sq. ft.		
e. Accelerator Storage & Shops		46,000 sq. ft.	Concrete block* walls, steel frame	Electroforming shop air conditioned.
f. Administration Building			Concrete block* walls, steel frame	
Administration	26,000			
Engr. & Science	16,000	42,000 sq. ft.		
g. Accelerator Control Room		5,000 sq. ft.	Concrete block walls*	Special ventilation, temperature control. Pressurized.
h. Auditorium		3,000 sq. ft.	Concrete block* walls	
i. Cafeteria		4,500 sq. ft.	Concrete block* walls	
j. Guard House		1,000 sq. ft.	Concrete block* walls	
k. Generator Buildings		15,000 sq. ft.	Concrete block* walls, steel frame	

TABLE XXI-3

DESCRIPTION OF BUILDINGS AND STRUCTURES (Continued)

l. Klystron D.C. Supply Station	16,000 sq. ft.	Concrete* block walls, steel frame	
m. Utility Buildings	7,000 sq. ft.	Concrete* block walls, steel frame	Pumps, boilers fan rooms.

Utility area requirements are tabulated below:

End Station Building Storage	20,000 sq. ft.
Corporation Yard	5,000 sq. ft.
Klystron Laboratory Storage	6,000 sq. ft.
Accelerator Storage	10,000 sq. ft.
Substations	82,500 sq. ft.
Meters	900 sq. ft.
Fuel Oil Tanks	400 sq. ft.
Cooling Tower Bases	8,000 sq. ft.
	132,800 sq. ft.

Shielding

Shielding requirements have been reviewed by Stanford, and current shielding designs are in accordance with their revised requirements. Along the accelerator a 35-foot thickness of earth is backfilled over the accelerator housing and compacted to at least 90 percent of maximum modified AASHO density.

The 35-foot thickness of shielding is penetrated by the cross-passageways, wave guide tubes, and exhaust air ducts. Straight-line radiation paths through these openings are avoided by utilizing horizontal

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* Or other types of incombustible walls of similar cost range.

and vertical angles, bends, and offsets in the routing of the openings.

In the end station areas the 35 feet of transverse earth shielding is maintained over the branching beam housing. Target yards are enclosed by deep earth embankments, with a minimum thickness of 50 feet at beam elevation along the sides of the yards, and 400 feet at the back of the yard within an arc of 30 degrees on either side of the beam centerline. Side embankments are carried to a height of 30 feet above the beam elevation and back embankments to 50 feet above the elevation of the beam.

Movable, high-density concrete shielding blocks provide the necessary transverse thickness of 25 feet and forward thickness of 35 feet in the target buildings and beam diagnostics areas. Blocks are dimensioned to conform to minimum clearance tolerances and staggered-joint requirements. A subgrade of compacted iron ore is provided in critical areas under target building floors to prevent radiation leakage from the beam into the building through the subgrade.

A minimum buffer zone width of 500 feet is maintained between target buildings and yards and project boundaries.

Water Supply

A study of potential water supply sources for the accelerator included evaluation of Searsville and Felt Lakes on Stanford lands, the City of Menlo Park, the proposed San Francisquito Creek Flood Control reservoir, a project reservoir utilizing the embankment as an earth dam, and the San Francisco Water Department Aqueduct No. 3, which crosses the northeast corner of the site.

Searsville and Felt Lakes are currently used by Stanford

University for irrigation and fire protection water supply. It is anticipated that in the future the entire capacity of the two lakes will be required for these and other university needs. Consequently, these sources have been excluded from further consideration.

The City of Menlo Park has expressed interest in supplying the necessary water to the project. Menlo Park obtains most of its water supply from the San Francisco Water Department (Hetch Hetchy), however, it appears that water for the accelerator project can be obtained directly from Hetch Hetchy.

The proposed San Francisquito Creek reservoir will, if constructed, provide an adequate water supply. However, because it is not yet in existence, it has been excluded from consideration. It should be kept in mind as a potential future water source.

Some thought has been given to utilizing the accelerator embankment as an earth dam and impounding water in the central valley north of the alignment. However, certain inherent disadvantages to this proposal, including the varying weight of water against the embankment with possible varying deformation of the beam alignment, the greater cost of the embankment construction, and other engineering considerations make this a less attractive solution than others, except perhaps as a supplemental supply or a cooling water pond.

The San Francisco Water Department (Hetch Hetchy system) has also expressed interest in providing water to the project. This water would come from Aqueduct No. 3, which crosses the northeast corner of the site. This is an existing source close at hand, with water of high quality and in plentiful supply. This source has therefore been selected and the cost estimate for water supply based on this choice.