

CONVENTIONAL FACILITIES

Fred Asiri

September 20, 1994

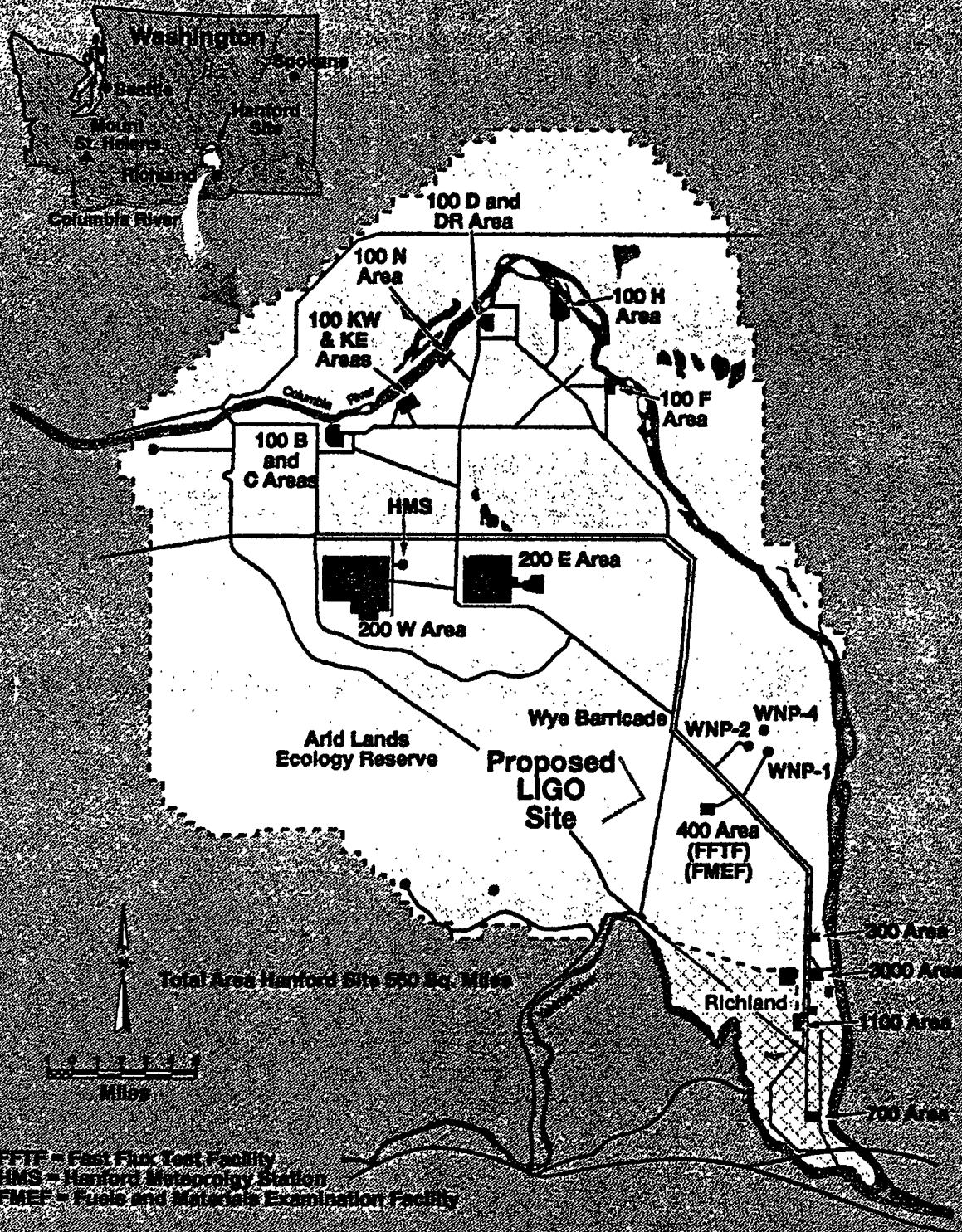
LIGO-G940001-00-□

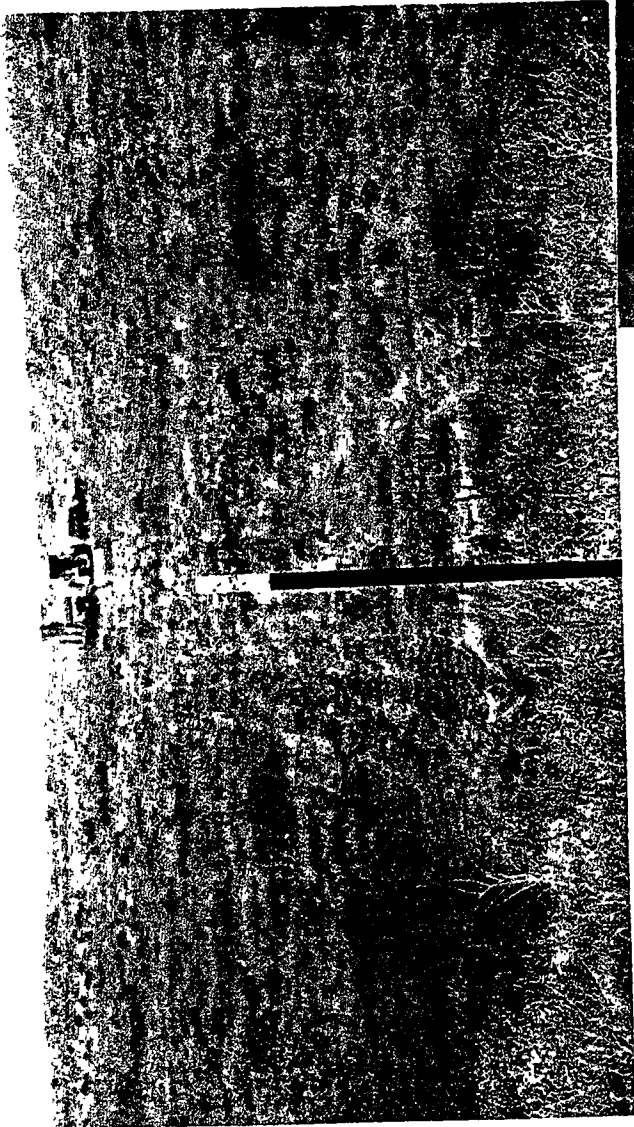
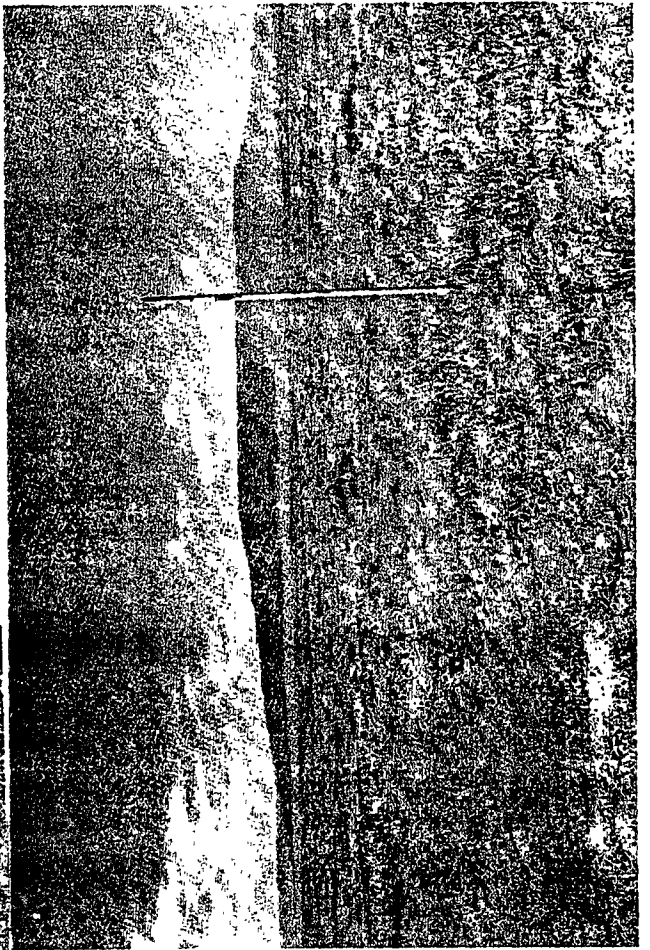
CONVENTIONAL FACILITIES

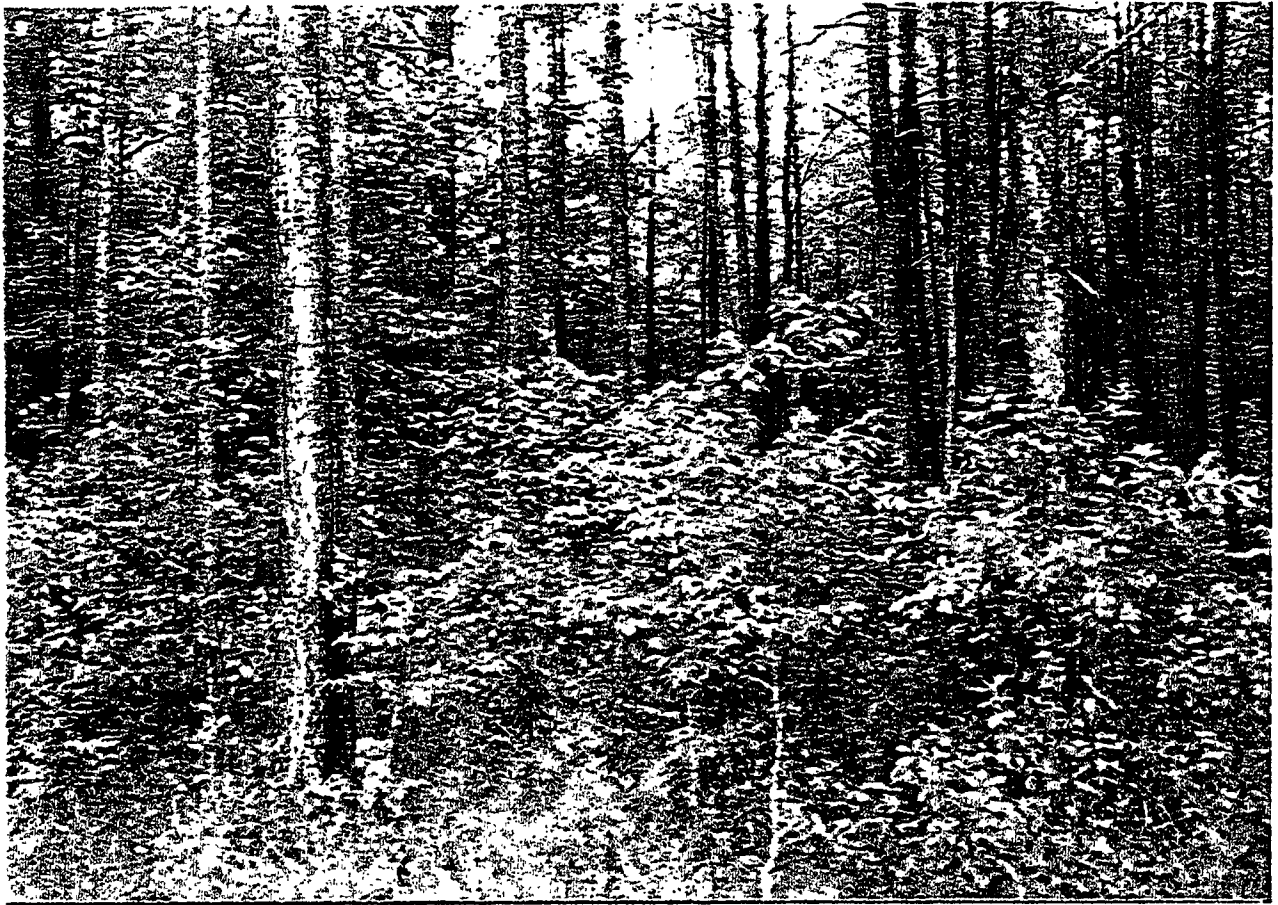
DESIGN OVERVIEW

- **SITE DESCRIPTION**
 - **SELECTION OF LIGO SITES (2/19/1992)**
 - **HANFORD, WASHINGTON SITE**
 - **LIVINGSTON, LOUISIANA SITE**
- **BUILDINGS AND ENCLOSURE**
 - **CORNER STATION**
 - **MID & END STATIONS**
 - **BEAM TUBE ENCLOSURE**
- **SITE DEVELOPMENT, UTILITIES & SERVICES**

Figure 1 Location and Regional Map of the Hanford Site







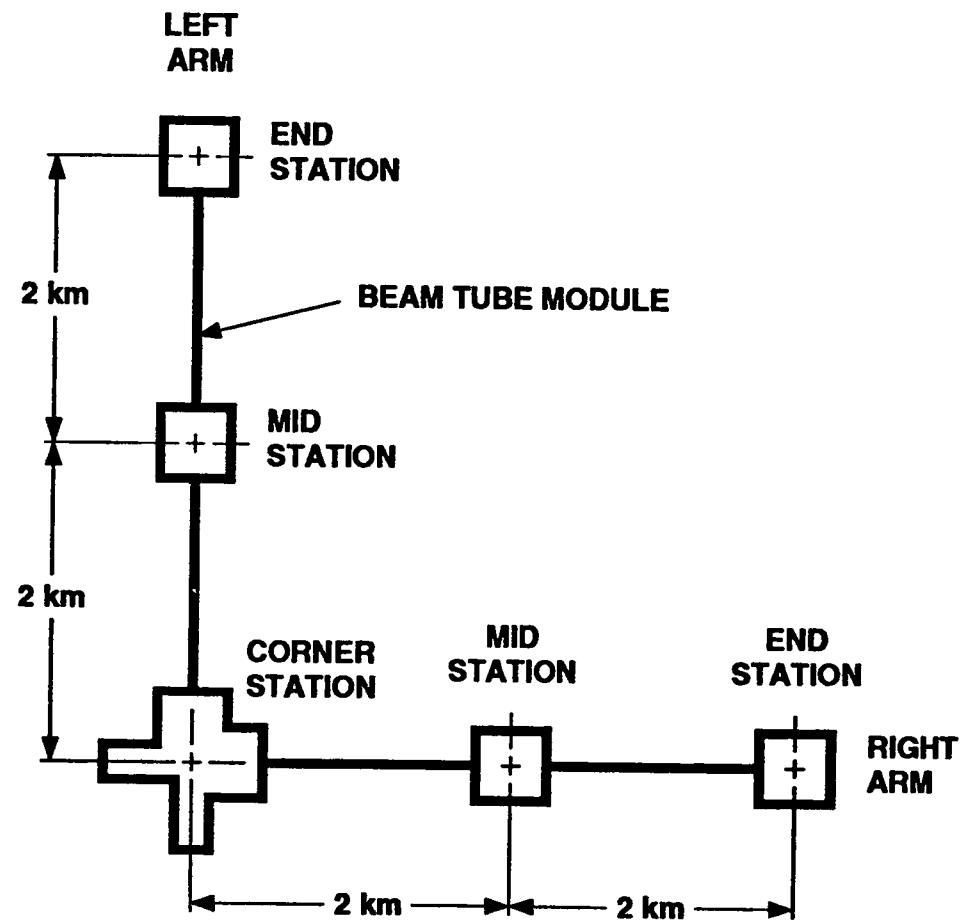
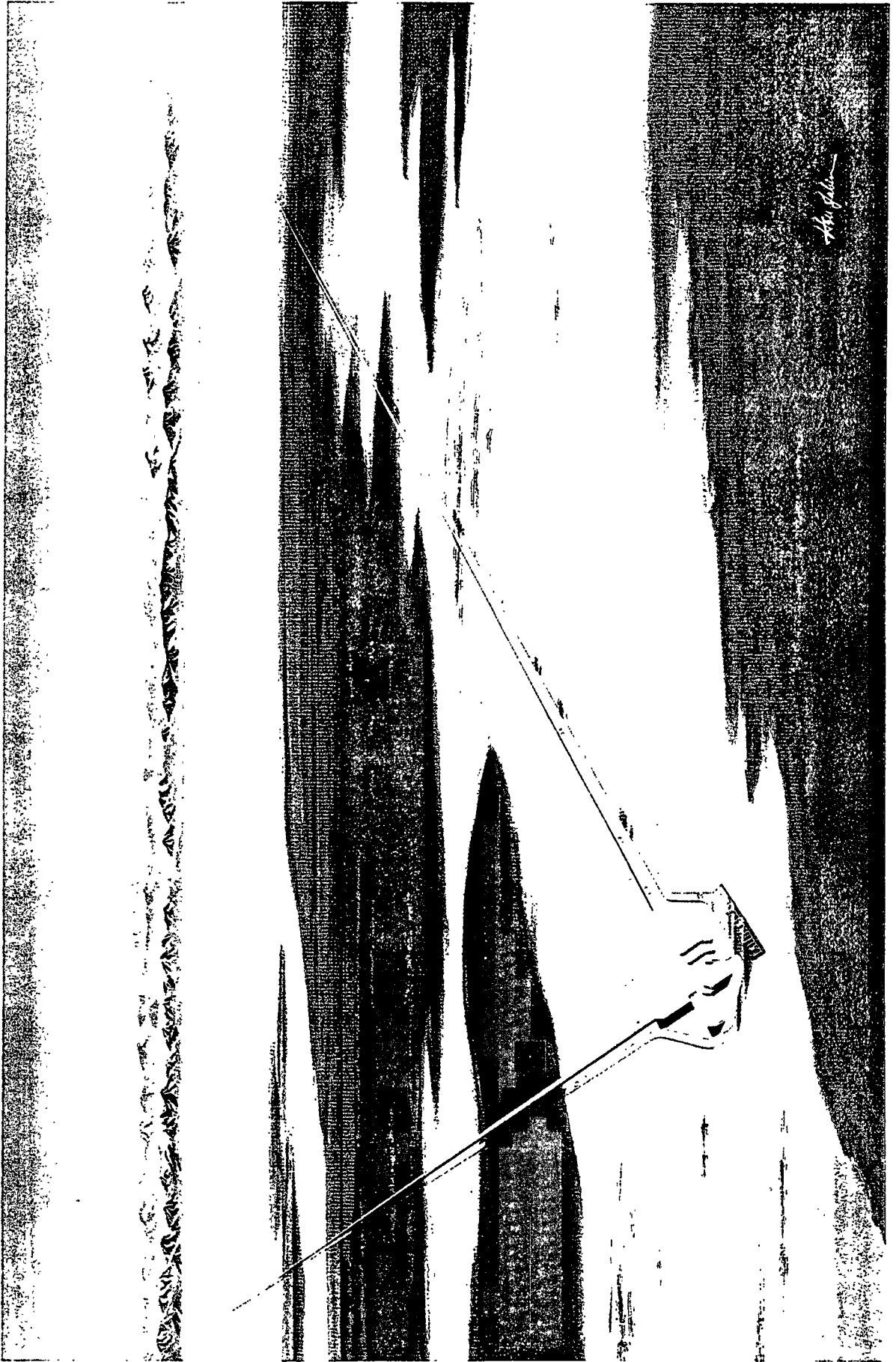
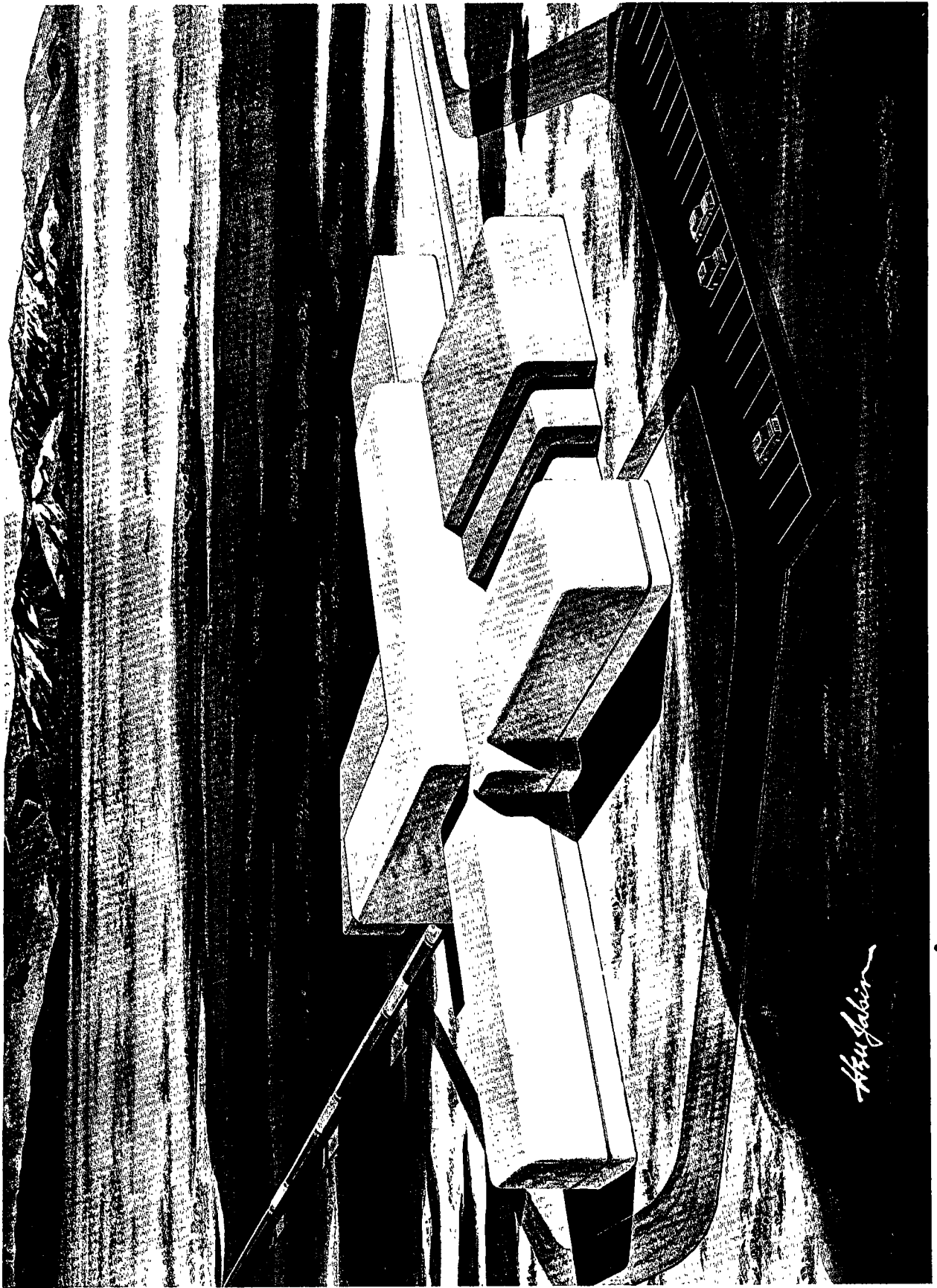


Fig. 1-1- Schematic layout of LIGO Site at Hanford, WA
 (Installation at Livingston, LA has no mid-stations)

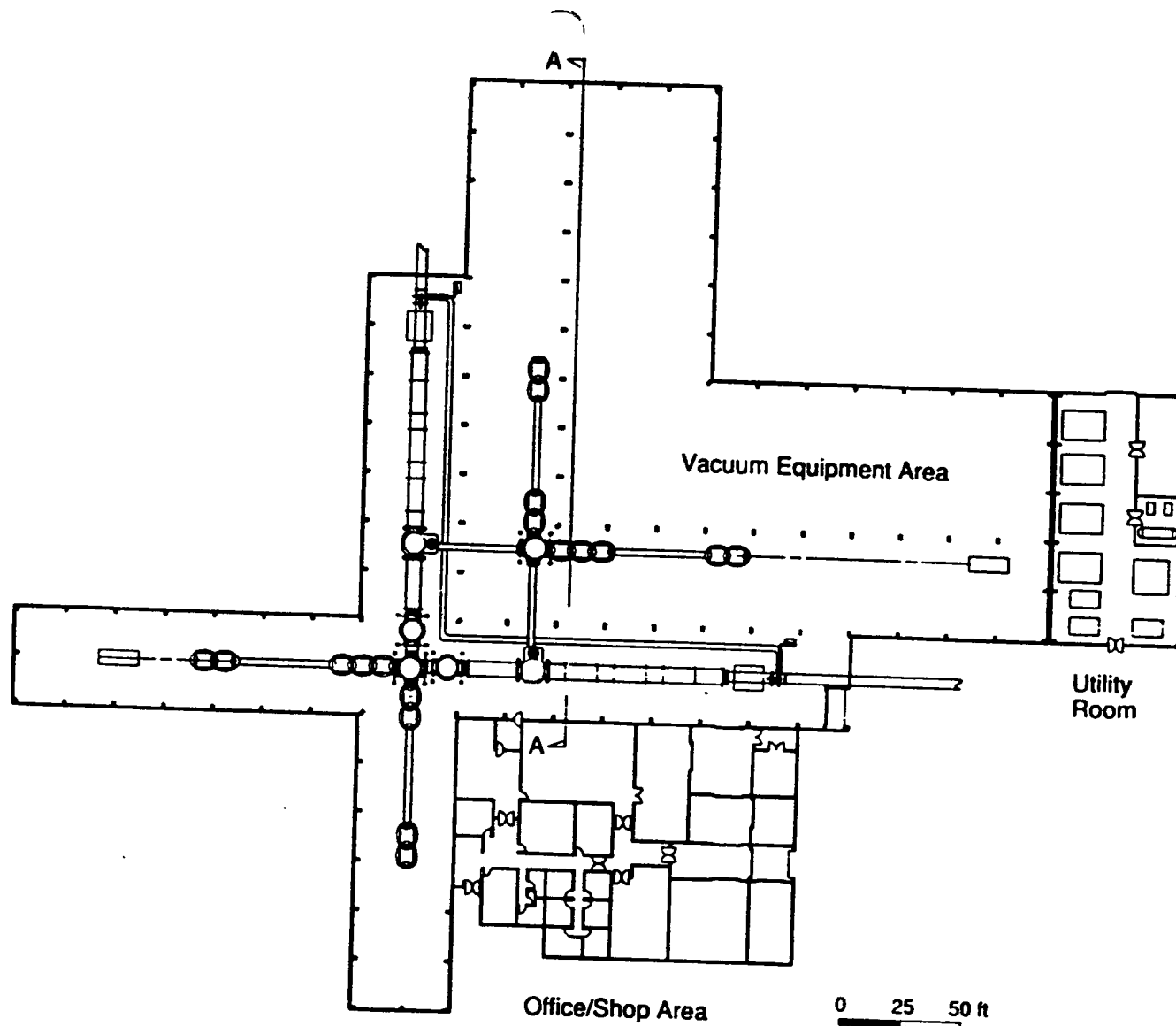


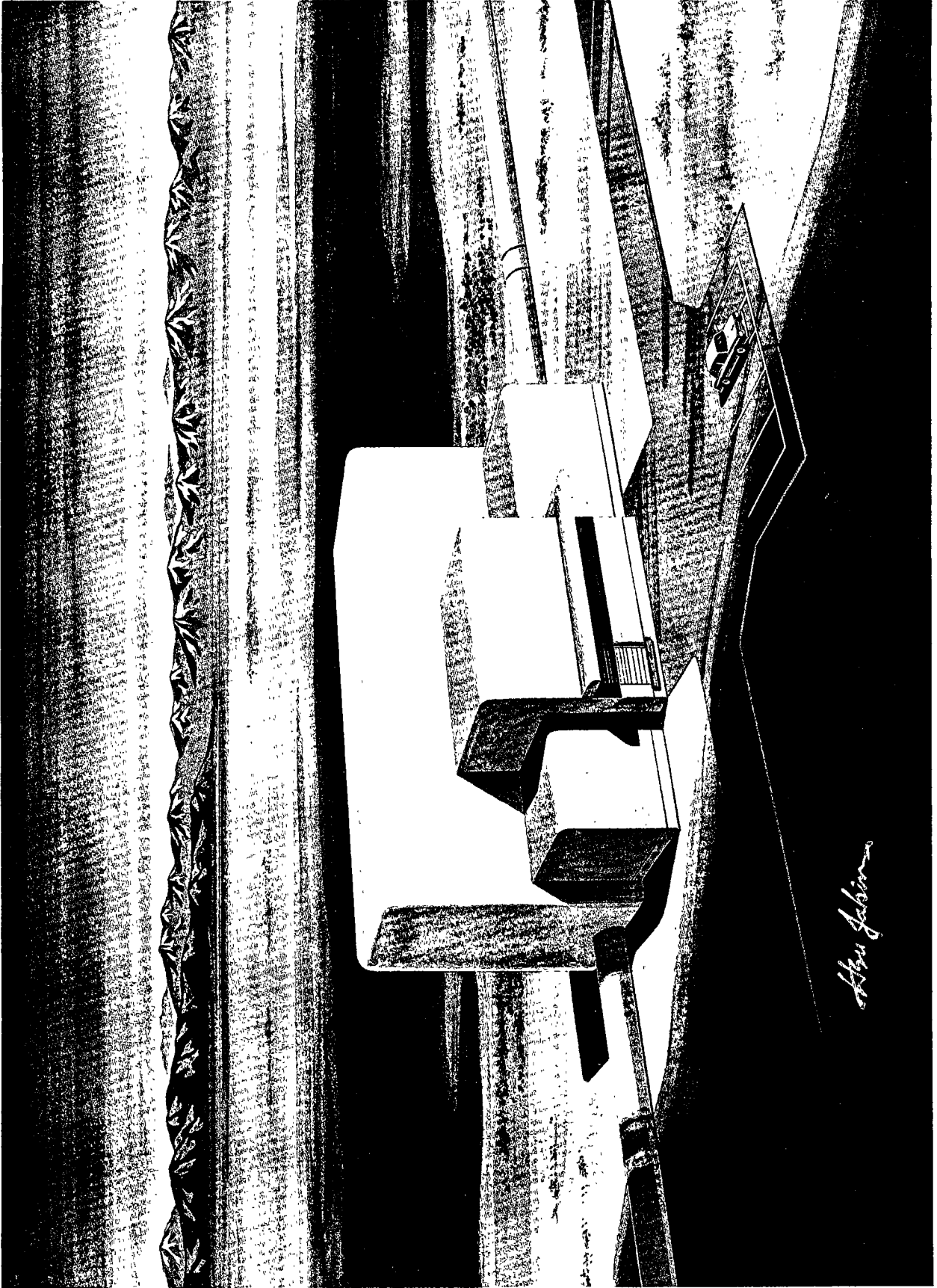
CONVENTIONAL FACILITIES DESIGN OVERVIEW

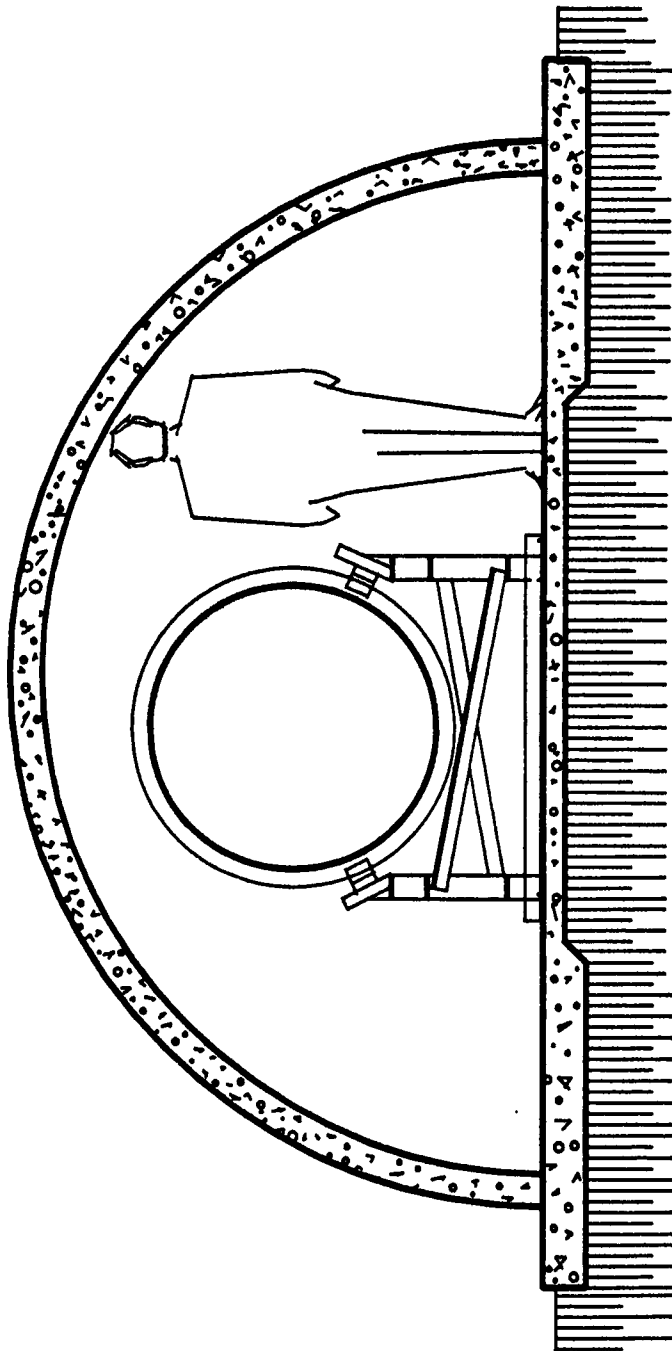
- **EACH STATION CONSISTS OF:**
 - **VACUUM EQUIPMENT AREA**
 - **OFFICE/SHOP AREA**
 - **UTILITY ROOM/HVAC SYSTEMS**
 - **CHILLER PLANT**
- **SPECIAL NEEDS/REQUIREMENTS**
 - **CONTROLLED ENVIRONMENT**
 - **CLEAN ROOM APPLICATION**
 - **GROUND VIBRATION ISOLATION FOR SENSITIVE EQUIPMENT**
 - **ACOUSTICALLY QUIET ENVIRONMENT**
 - **SEALED AND PRESSURIZED ENVIRONMENT**
 - **LOW STRAY MAGNETIC FIELD POWER DISTRIBUTION**
 - **LOW RFI ENVIRONMENT**
- **BEAM TUBE ENCLOSURE**
 - **PROTECTS BEAM TUBE FROM ENVIRONMENT**
 - **PREVENTS DAMAGE FROM STRAY BULLETS (Hunters)**
 - **PROVIDES INTERMITTENT PERSONNEL ACCESS (Inspection/Maintenance)**



Hubert

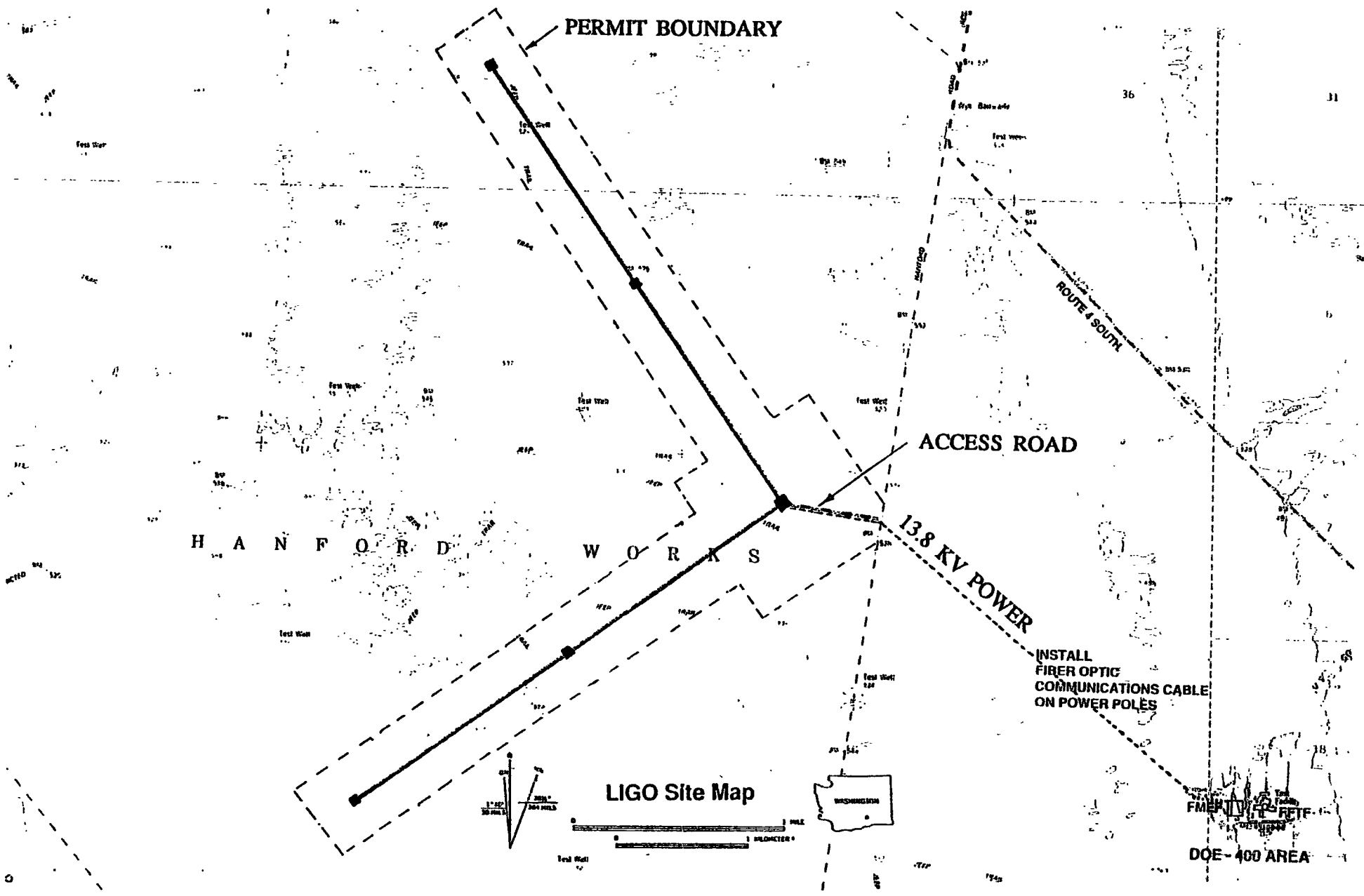






**CONVENTIONAL FACILITIES
STATUS / HANFORD, WA**

- **LAND ACQUISITION**
 - **LAND USE PERMIT (Has Been Obtained)**
- **SITE INVESTIGATION**
 - **STAKING/PROFILE SURVEY (Completed)**
 - **ENVIRONMENTAL ASSESSMENT (Completed)**
 - **GEOTECHNICAL SURVEY (Completed)**
 - **GPS MONUMENTS & AERIAL TOPOGRAPHICAL SURVEY (Completed)**
 - **AMBIENT GROUND NOISE MEASUREMENTS (In Progress)**
- **SITE DEVELOPMENT**
 - **DESIGN OF ROUGH-GRADING (Completed)**
 - **CONSTRUCTION OF WATER WELL (Complete)**
 - **CONSTRUCTION OF ROUGH-GRADING (In Progress)**



PERMIT BOUNDARY

ACCESS ROAD

138 KV POWER

INSTALL FIBER OPTIC COMMUNICATIONS CABLE ON POWER POLES

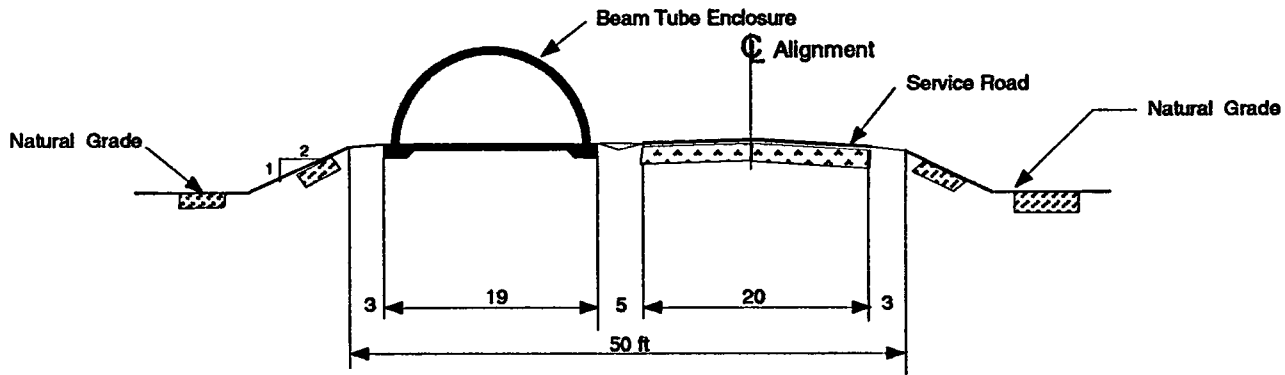
H A N F O R D W O R K S

LIGO Site Map

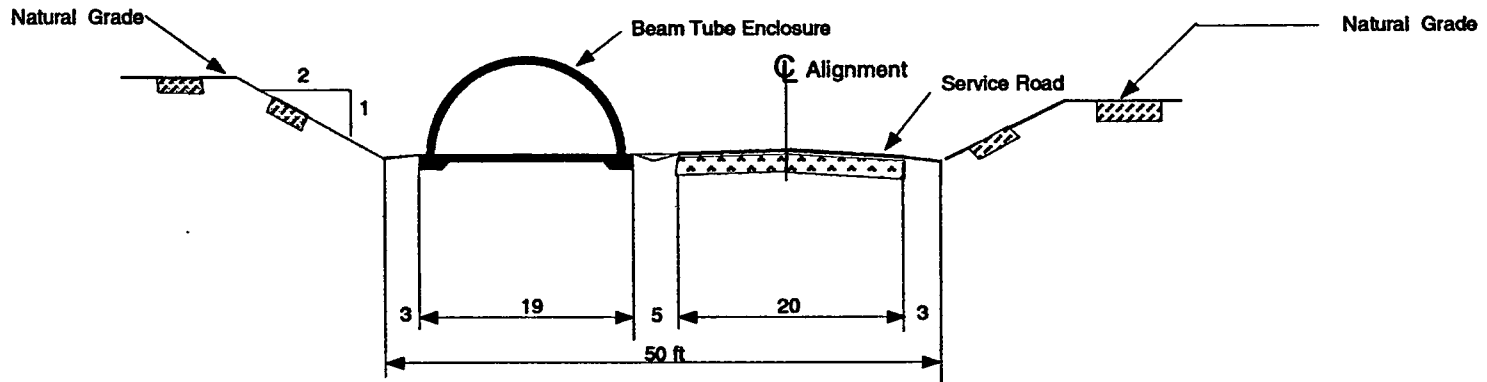


DOE - 400 AREA

FMEATIVITY REF



PROPOSED CROSS SECTION AT FILL AREA



PROPOSED CROSS SECTION AT CUT AREA

CONCEPTUAL CROSS SECTIONS ALONG LIGO ARMS
HANFORD, WA

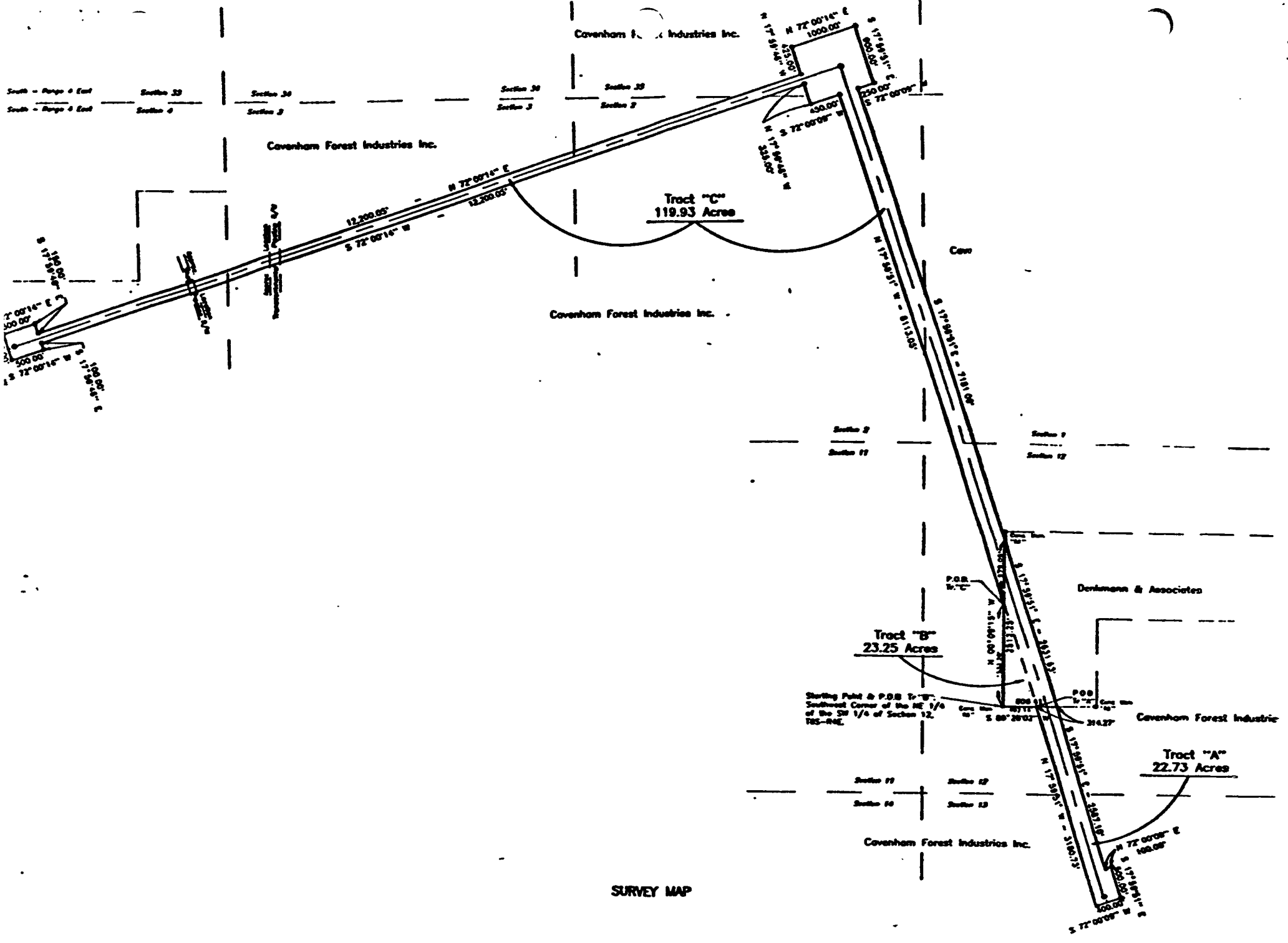
**CONVENTIONAL FACILITIES
STATUS / LIVINGSTON, LA**

- **LAND ACQUISITION**
 - **TRANSFER OF LAND TO LSU (Pending)**
 - **LSU/NSF LEASE AGREEMENT (Pending)**
- **SITE INVESTIGATION**
 - **STAKING/PROFILE SURVEY (Completed)**
 - **ENVIRONMENTAL ASSESSMENT (In Progress)**
 - **WETLAND DELINEATION & SECT. 404 PERMIT APPLICATION (In Progress)**
 - **HYDROLOGIC & HYDRAULIC SURVEY (Completed)**
 - **GEOTECHNICAL SURVEY (In Progress)**
 - **GPS MONUMENTS & AERIAL TOPOGRAPHICAL SURVEY (Contracted Out, Awaiting Clearing of the Land)**
 - **AMBIENT GROUND NOISE MEASUREMENTS (In Progress)**

South - Range 4 East
Section 29
Section 30
Section 31
Section 32

Section 33
Section 34
Section 35
Section 36

Section 37
Section 38
Section 39
Section 40



SURVEY MAP

Gantt Chart : TUBE ENCLOSURE SCHEDULE

Project span: 06/01/92 To 01/29/99, 336 Week(s)

Run Date: 09/19/94

Activity Name	Aux. Code	Pref Start	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
			'92	'93	'94	'95	'96	'97	'98	'99	'00	'01
LIGO FACILITIES DESI		06/01/92										
SELECT SLAB DES CTR	TE-WA-1	06/01/94										
DESIGN TUBE SLAB	TE-WA	06/01/94										
COMPLETE SLAB/COVER	TE-WA-1	11/01/94										
SELECT TUBE SLAB CTR	TE-WA	07/11/95										
NSF REVIEW	TE-WA	10/03/95										
SELECT TUBE SLAB CON	TE-LA	10/03/95										
INITIATE SLAB CONSTR	TE-WA-2	10/30/95										
CONSTRUCT SLAB	TE-WA	10/31/95										
NSF REVIEW	TE-LA	01/09/96										
COMPLETE SLAB	TE-WA-1	03/04/96										
INITIATE SLAB CONST	TE-LA-2	12/20/96										
CONSTRUCT SLAB	TE-LA	01/06/97										
COMPLETE SLAB	TE-LA-1	04/25/97										

Gantt Chart : FACILITY CONSTRUCTION SCH

Project span: 06/01/92 To 01/29/99, 336 Week(s)

Run Date: 09/19/94

Activity Name	Aux. Code	Pref Start	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
			'92	'93	'94	'95	'96	'97	'98	'99	'00	'01
LIGO FACILITIES DESI		06/01/92	[Gantt bar spanning from 06/01/92 to 01/29/99]									
SITE INVESTIGATION	CC-WA	06/01/92	[Gantt bar from 06/01/92 to approx 03/15/93]									
LAND AQUISATION	CC-WA	06/01/92	[Gantt bar from 06/01/92 to approx 03/15/93]									
ENVIRONMENTAL ASSESS	CC-WA	11/02/92	[Gantt bar from 11/02/92 to approx 03/15/93]									
LAND PUR/XFER	CC-LA	02/15/93	[Gantt bar from 02/15/93 to approx 03/15/93]									
SITE INVESTIGATION &	CC-LA	02/15/93	[Gantt bar from 02/15/93 to approx 03/15/93]									
INITIATE SITE INVEST	CC-C-L1	02/15/93	[Gantt bar from 02/15/93 to approx 03/15/93]									
ENVIRONMENTAL ASSESS	CC-LA	04/01/93	[Gantt bar from 04/01/93 to approx 03/15/93]									
SITE PLAN	CC-WA	06/01/93	[Gantt bar from 06/01/93 to approx 03/15/93]									
NSF EA REVIEW/APPROV	CC-WA	08/20/93	[Gantt bar from 08/20/93 to approx 03/15/93]									
RELEASE RG RFP	CC-WA-2	10/12/93	[Gantt bar from 10/12/93 to approx 03/15/93]									
PREPARE PROPOSAL	CC-WA	10/12/93	[Gantt bar from 10/12/93 to approx 03/15/93]									
SELECT RG CONTRACTOR	CC-WA	11/08/93	[Gantt bar from 11/08/93 to approx 03/15/93]									
NSF REVIEW	CC-WA	11/26/93	[Gantt bar from 11/26/93 to approx 03/15/93]									
INITIATE SITE DEVEL.	CC-WA-L1	03/14/94	[Gantt bar from 03/14/94 to approx 03/15/93]									
ROUGH GRADING	CC-WA	03/14/94	[Gantt bar from 03/14/94 to approx 03/15/93]									
404 PERMIT PROCESS	CC-LA	06/15/94	[Gantt bar from 06/15/94 to approx 03/15/93]									
APPLY FOR 404 PERMIT	CC-LA-2	06/15/94	[Gantt bar from 06/15/94 to approx 03/15/93]									
PREP. BID AND SELECT	CC-C	08/16/94	[Gantt bar from 08/16/94 to approx 03/15/93]									
RELEASE A&E RFP	CC-C-2	08/16/94	[Gantt bar from 08/16/94 to approx 03/15/93]									
COMPLETE 404 PROCESS	CC-LA-2	10/18/94	[Gantt bar from 10/18/94 to approx 03/15/93]									
CLEAR LAND	CC-LA	10/19/94	[Gantt bar from 10/19/94 to approx 03/15/93]									
NSF REVIEW	CC-C	10/25/94	[Gantt bar from 10/25/94 to approx 03/15/93]									
SELECT AE CONTRACTOR	CC-C-L1	11/14/94	[Gantt bar from 11/14/94 to approx 03/15/93]									
CONCEPTUAL DESIGN	CC-C	11/15/94	[Gantt bar from 11/15/94 to approx 03/15/93]									
NSF EA REVIEW/APPROV	CC-LA	01/04/95	[Gantt bar from 01/04/95 to approx 03/15/93]									
AERIAL SURVEY	CC-LA	01/04/95	[Gantt bar from 01/04/95 to approx 03/15/93]									
RG DESIGN	CC-LA	02/20/95	[Gantt bar from 02/20/95 to approx 03/15/93]									
TRADE STUDIES	CC-C	02/21/95	[Gantt bar from 02/21/95 to approx 03/15/93]									

Gantt Chart : FACILITY CONSTRUCTION SCH

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Activity Name	Aux. Code	Pref Start	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
			'92	'93	'94	'95	'96	'97	'98	'99	'00	'01
ISSUE FONSI	CC-LA-L1	02/28/95				▲						
LA PREL. DESIGN	CC-LA	04/18/95				■						
WA PREL. DESIGN	CC-WA	04/18/95				■						
SELECT RG CONTRACTOR	CC-LA	05/15/95				■						
NSF REVIEW	CC-LA	07/10/95				+						
WA PDR	CC-WA-2	07/10/95				▲						
WA FINAL DESIGN	CC-WA	07/11/95				■						
INITIATE SITE DEVELO	CC-LA-L1	08/04/95				▲						
ROUGH GRADING	CC-LA	08/07/95				■						
LA PDR	CC-LA-2	10/02/95				▲						
LA FINAL DESIGN	CC-LA	10/03/95				■						
BUILDING FDR WA	CC-WA-2	01/22/96				▲						
SELECT WA CONTRACTOR	CC-WA	01/23/96				■						
GROUND SETTELMENT	CC-LA	02/19/96				■						
BUILDING FDR LA	CC-LA-2	04/15/96				▲						
SELECT LA CONTRACTOR	CC-LA	04/16/96				■						
NSF REVIEW WA	CC-WA	05/14/96				+						
INITIATE BUILDING CO	CC-WA-2	06/10/96				▲						
CONSTRUCTION PHASE	CC-WA	06/11/96				■						
NSF REVIEW LA	CC-LA	08/06/96				+						
INITIATE BUILDING CO	CC-LA-2	12/20/96				▲						
CONSTRUCTION PHASE	CC-LA	01/06/97				■						
JOINT OCCUPANCY	CC-WA-L1	09/01/97						▲				
ACCEPTANCE PHASE	CC-WA	09/02/97						■				
ACCEPT BUILDINGS	CC-WA-1	01/05/98						▲				
JOINT OCCUPANCY	CC-LA-L1	03/27/98						▲				
ACCEPTANCE PHASE	CC-LA	03/30/98						■				
ACCEPT BUILDINGS	CC-LA-1	07/17/98						▲				