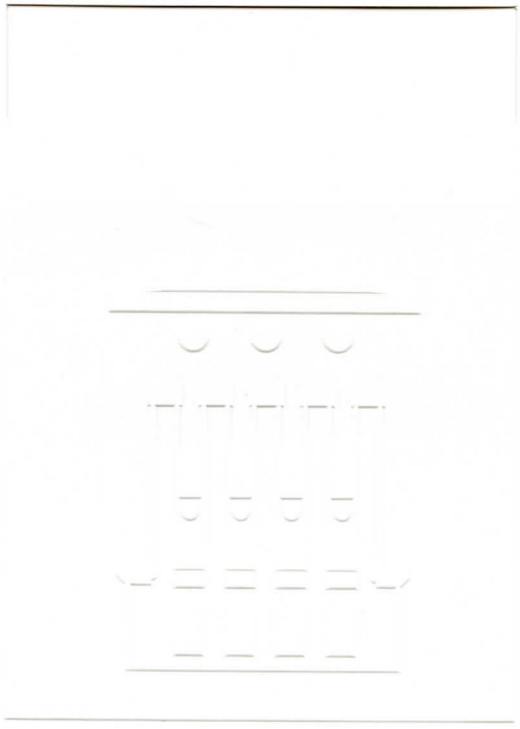
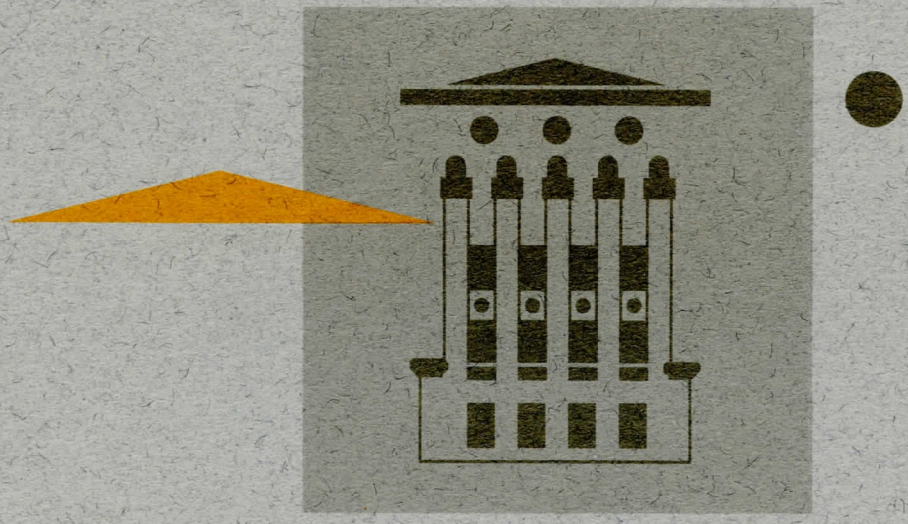
Spitznagel



EROS Building Addition Study

Sioux Falls, South Dakota



May 8, 1991

PREFACE:

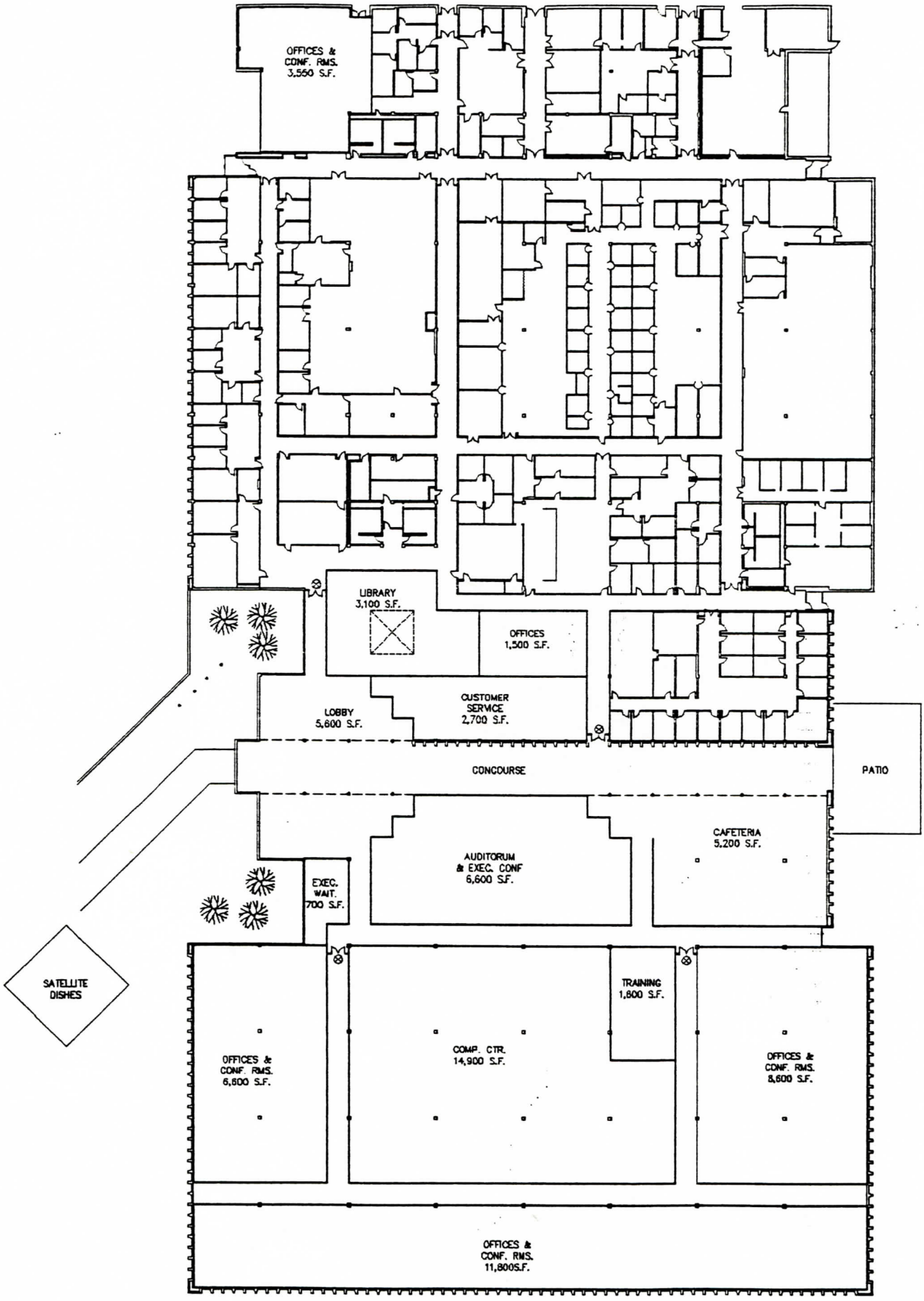
This report deals with the construction costs for remodeling the existing building. The remodeled areas are the result of the direct impact that the proposed addition and connecting link will have on the existing facility. This report does not include regular maintenance and improvement costs which would arise regardless of the proposed addition.

In order to determine what areas would be impacted, it was necessary to prepare a preliminary Masterplan. This plan shows rough areas and locations for departments and functions as well as points of access. As this plan is non-specific, the final design may vary significantly, however, the general guidelines should remain constant.

The estimates quoted are based on a cost per square foot base.

Brian W. Heidbrink
Architectural Design Associate
Spitznagel, Inc.

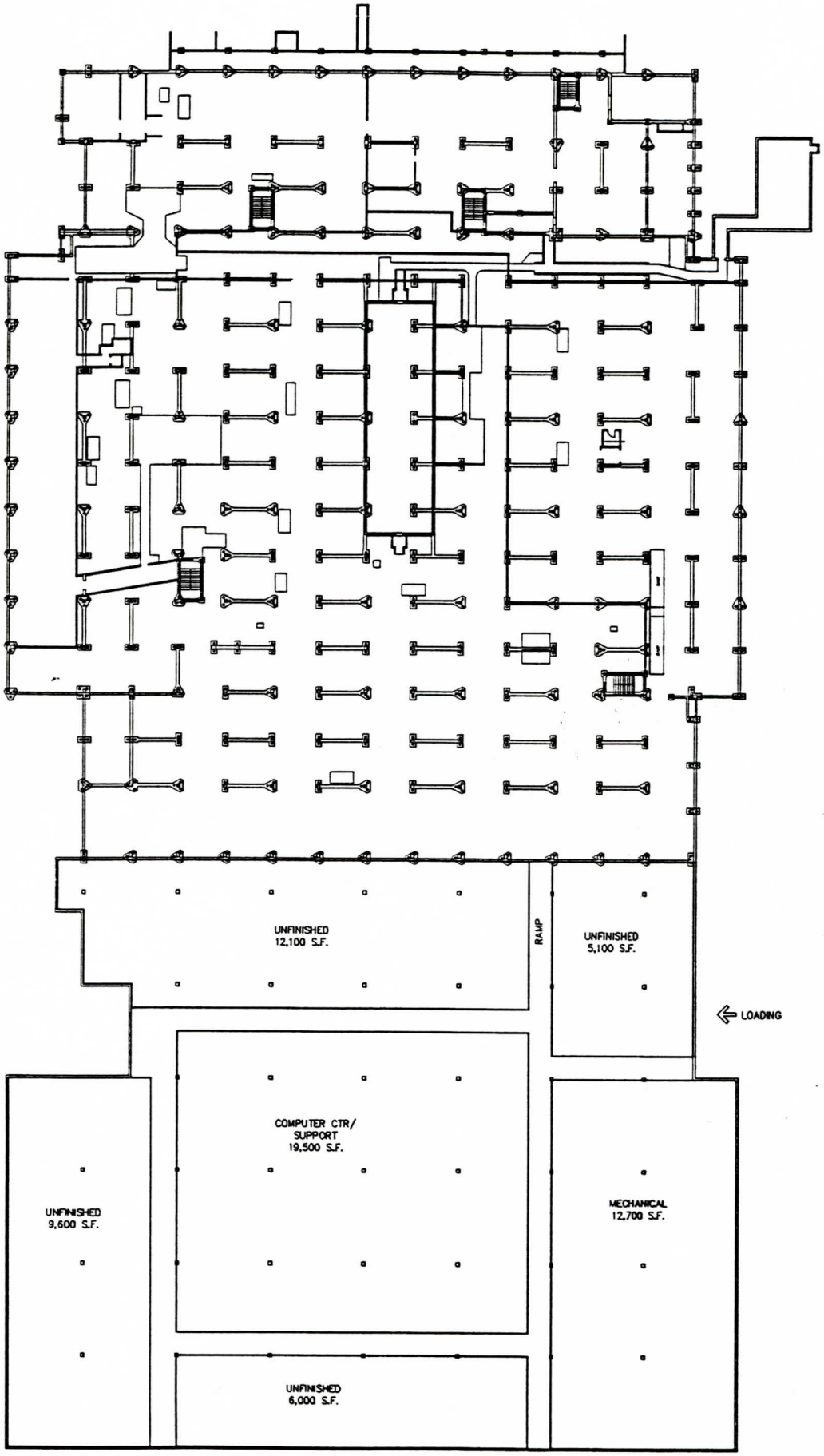
EROS BUILDING ADDITION STUDY



PROPOSED FLOOR PLAN

N.T.S.

⊗ INDICATES LOCATIONS OF SECURITY CARD-KEY ACCESS DOORS



PROPOSED LOWER LEVEL FLOOR PLAN

N.T.S.

MASTERPLAN DESCRIPTION:

The Masterplan was laid out based on guidelines provided by the EROS Building Task Force. Any changes to the program will require revisions to the Masterplan and possibly the cost estimate.

The purpose of the Masterplan is to indicate approximate sizes and locations of new and relocated offices, functional areas, and points of access. The plan simply represents conceptual guidelines to assist the cost estimating and designing processes. The final design solution may vary significantly.

Parameters set forth include that the EOS addition should have 65,000 gross square feet per floor and that the two buildings be connected by a 20'-0" wide atrium type space.

The Masterplan illustrates that the proposed combined facilities would have a new main entrance on the axis of the visually dominant atrium/concourse. This concourse would act as a multi-use space providing overflow from the publicly accessible lobby, auditiorium and cafeteria. At the opposite end of the concourse from the entry would be an outdoor patio. The cafeteria is located near an exterior wall to provide access for deliveries and trash removal.

The auditorium is located directly off the concourse for public access and adjacent to executive and tele-conference rooms allowing a combined audio-visual support/storage room.

The balance of the EOS addition is comprised of a centrally located computer facility accessible to perimeter office space (including small conference rooms). This arrangement also maximizes the exterior views for offices.

The northwest third of the addition is non-computer related and therefore will not require raised access flooring.

The new combined facility allows the old cafeteria and lobby to be eliminated. This frees up space to provide an enlarged library and relocated Customer Service department adjacent to the new lobby and maintain easy access from the lobby to the management offices.

Relocation of some Science and Applications Branch space and EDSPO space allows a second point of access to the concourse without dividing the Science and Applications Branch.

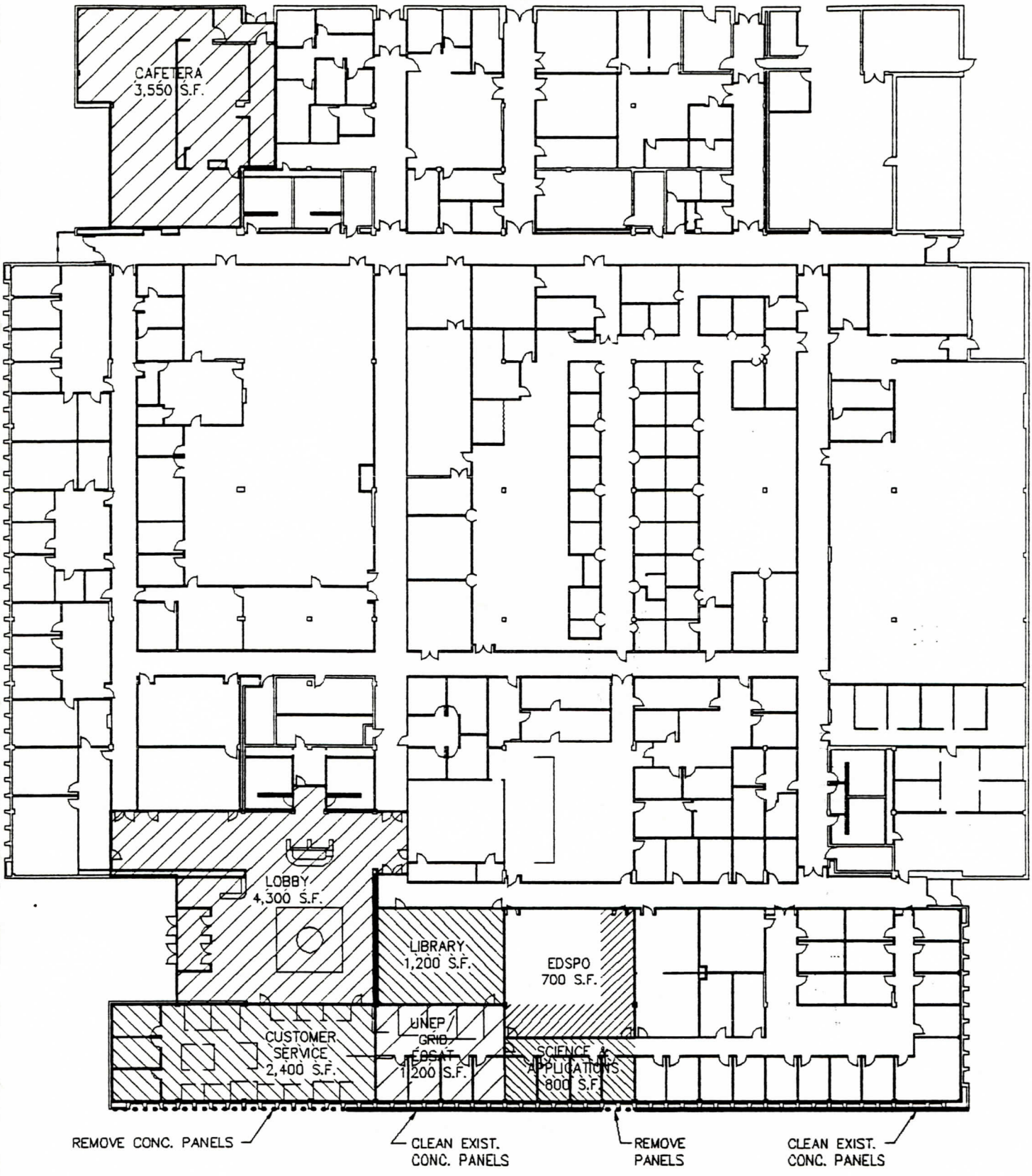
After all program requirements are met, there is about 2,350 s.f. in the DHB and 5,000 s.f. in the EOS addition for future office expansion.

The lower level has a centrally located computer center and support facilities with unfinished space around the perimeter. The upper and lower computer areas require vertical adjacency.

The mechanical room is located near the loading access. This room will require a recessed floor to obtain a 15 foot high ceiling.

The southeast wall of the lower level addition will be exposed above grade and has the opportunity for exterior views. The adjacent space would be ideal for future offices.

The only impact to the DHB crawl space is for a connecting ramp to the two different floor elevations.



PROPOSED AREAS OF DEMOLITION

N.T.S.

DEMOLITION:

CAFETERIA - Demolition of cafeteria facilities shall include:

- Removal of all food service equipment.
- Removal of all metal stud/gyp. bd. and conc. block walls within boundary indicated on plan.
- Removal of carpet, acoustical ceiling panels (A.C.P.), and ceiling grid in lunch room.
- Removal of quarry tile, A.C.P., and ceiling grid in food service area.
- Patch and repair of all surfaces for application of new finishes, including application of self leveling gypsum concrete at floor drain locations and quarry tile setting bed.

COST ESTIMATE:

3550 s.f. X $4.75/s.f. = $ 16,863.00

LOBBY - Demolition of lobby area shall include:

- Removal of aluminum storefront system at vestibule and along south wall.
- Removal of wing walls behind security desk and between lobby and customer service.
- Removal of gyp.bd. and metal stud wall between lobby and library.
- Removal of 2'X2' granite pavers.
- Removal of plaster ceiling.
- Removal of security desk and information desk and display wall.
- Patch and repair all surfaces for application of new finishes.
- Remove and replace skylight glazing with new insulated and reflective glass. Framing to be retained.

COST ESTIMATE:

4,300 S.F. x $5.30/S.F. = $ 22,790.00

LIBRARY - Demolition of library area shall include:

- Removal of NE gyp.bd. and metal stud wall.
- Removal of A.C.P. and grid.
- Removal of carpet and vinyl base.
- Patch and repair all surfaces for application of new finishes.

COST ESTIMATE:

1,200 s.f. X $3.89/s.f. = $ 4,668.00

CUSTOMER SERVICE - Demolition of Customer Service area to include the following:

- Removal of gyp.bd./metal stud walls around three offices.
- Removal of A.C.P. and grid.
- Removal of carpet and vinyl base.
- Patch and repair surfaces as required for new finishes.

COST ESTIMATE:

2,400 s.f. X $3.89/s.f. = $ 9,336.00

UNEP/GRID, EOSAT - It is assumed that the four individual offices will remain for use by the relocated Customer Service. Demolition of this area will include:

- Removal of carpet and vinyl base in secretary area.
- Removal of A.C.P. in secretary area (grid to remain and sound batts to be reused).
- Walls around individual offices and office finishes to remain.
- Patch and repair all surfaces as required for application of new finishes.

COST ESTIMATE:

1,200 sf X $3.02/s.f. = $ 3,624.00

EDSPO - This area is currently scheduled for remodeling to provide office type space. It is assumed that the remodeled space will have a new ceiling at 8'-0" height and carpeted floor. Some areas will be affected by the new plan. This includes 400 s.f. at location of the new corridor and 300 s.f. at location of Customer Service. It is assumed that the remaining 900 s.f. will not require remodeling.

Demolition shall include:

- Removal of carpet and vinyl base.
- Removal of A.C.P. (Grid to remain at location of new Customer Service and grid to be removed at location of new corridor.)
- Removal of SW and SE gyp.bd./metal stud walls.
- Removal of portion of gyp.bd./metal stud walls at location of new corridor.
- Patch and repair all surfaces as required for application of new finishes.

COST ESTIMATE:

700 s.f. X $3.02/s.f. = $ 2,114.00

SCIENCE AND APPLICATIONS - It is assumed that three of the individual offices shall remain for use by the relocated Customer Services. One office will be eliminated for the new corridor.

Demolition of this area shall include:

- Removal of gyp.bd and metal stud wall at location of new corridor.
- Removal of A.C.P. and grid at location of new corridor.
- Removal of carpet at location of new corridor.
- Removal of vinyl asbestos tile in hall area indicated on plan.
- Removal of A.C.P. in hall area indicated on plan. (Grid to remain and sound batts to be reused).
- Patch and repair all surfaces as required for application of new finishes.

COST ESTIMATE:

800 s.f. x $3.89/s.f. =	$ 3,112.00

EXTERIOR PANELS - Demolition of the main floor exterior shall include:

- Removal of (1) solid pre-cast conc. panel section and (6-1/2) window pre-cast conc. panel sections along customer service.
- Cut and remove half of (2) window pre-cast conc. panels at new corridor location.
- Removal of pre-cast conc. panels up to 10'-0" above finished floor only.
- Clean balance of panels to remove iron spot stains.

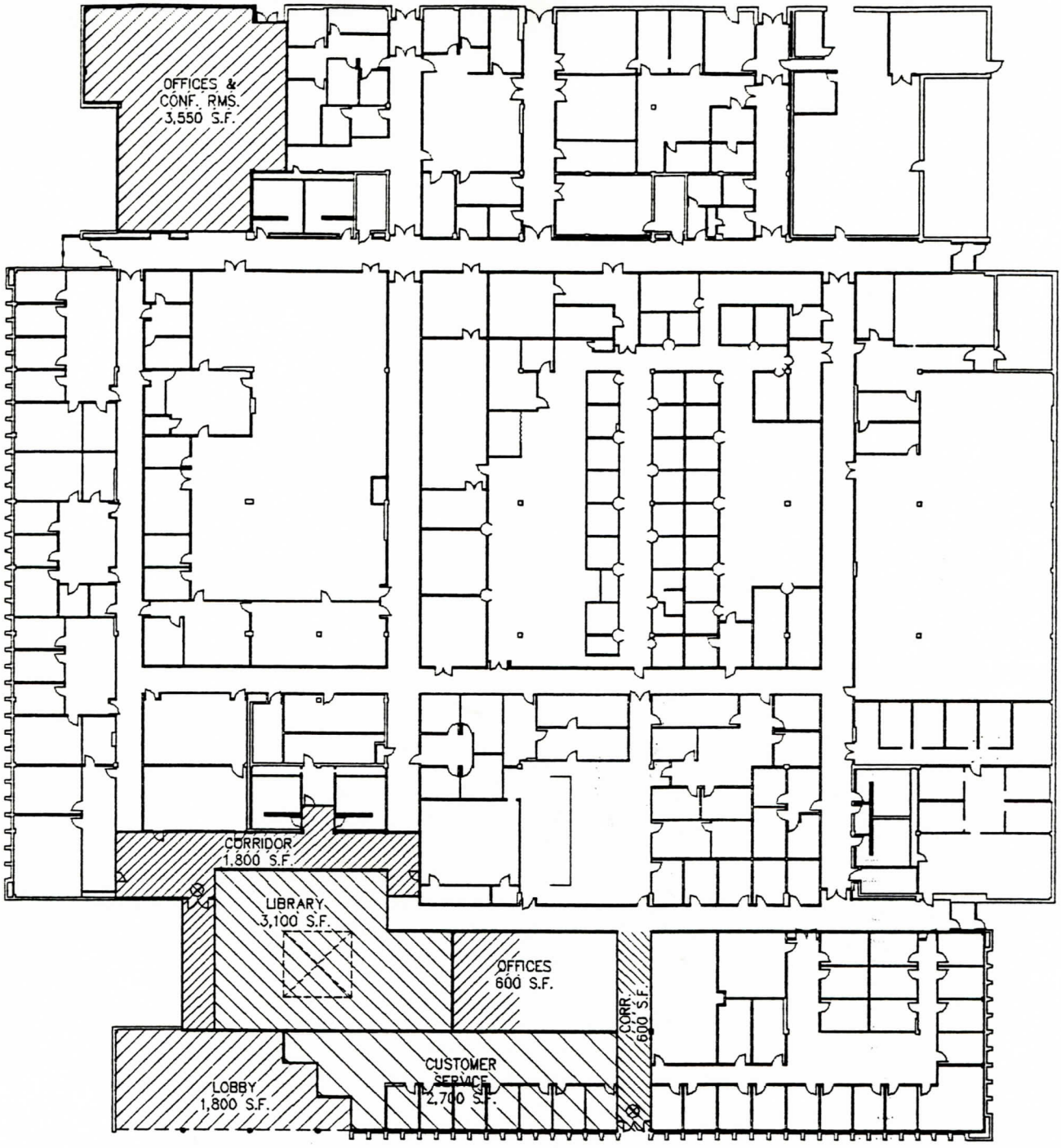
COST ESTIMATE:

9-1/2 panels X $200/panel =	$ 5,700.00

LOWER LEVEL ACCESS - Demolition for lower level access between buildings will require the cutting & removal of a 18'-0" wide section of the lower level grade beam. The entire 10'-0" height will need to be removed.

COST ESTIMATE:

180 s.f. x $16.35 =	$ 2,943.00
New Steel Beam =	640.00
Misc. Excavation =	750.00
	$ 4,333.00
TOTAL ARCHITECTURAL DEMOLITION	$ 72,540.00



PROPOSED AREAS OF CONSTRUCTION

N.T.S.

⊗ INDICATES LOCATIONS OF SECURITY CARD-KEY ACCESS DOORS

NEW CONSTRUCTION:

NEW OFFICE SPACE AT PREVIOUS CAFETERIA LOCATION - Relocation of the cafeteria to the EOS addition will allow approx 3,550 s.f. of area to be finished as office space.

- (12-15) individual offices with the balance of space for open office.
- All new walls to be gyp.bd./metal studs with paint to bottom of ceiling.
- All floors shall be carpet with vinyl base.
- Install new A.C.P. in new grid with 1-1/2" thick sound attenuation batts to 2'-0" on either side of office walls (8'-0" height).
- All new doors shall be wood with hollow metal frames.

COST ESTIMATE:

3,550 s.f. X $30/s.f. = $106,500.00

CORRIDORS - There will be two new corridors created. One of about 1,800 s.f. located at the previous lobby location. The other of about 600 s.f. located at the old EDSPO. These corridors to be finished to match existing corridors:

- Vinyl comp. tile and vinyl base.
- Painted gyp.bd. walls.
- A.C.P. in new grid (10'-0" height) 1-1/2" sound attenuation batts to 2'-0" on opposite side of corridor walls and over entire corridor ceiling.
- Each corridor to have a pair of wood doors with hollow metal frames and card access security locks.
- Provide new aluminum storefront system at previous vestibule location.

COST ESTIMATE:

2,400 s.f. X $30/s.f. = $ 72,000.00

LIBRARY - A new library approx. 3,100 s.f. shall be located at the previous lobby and portion of library locations. Finishes shall include:

- (2) 150 s.f. offices.
- (1) 180 s.f. storage room.
- The balance of the area to be open reading/stack area.
- All areas shall be carpet with vinyl base.
- All new walls shall be gyp.bd. on metal studs.
- Offices and storeroom to have painted walls.
- Reading/stack area to be wall fabric.
- Reading/stack area to get new A.C.P. and grid (10'-0" height).

- Offices and storeroom to get A.C.P. in new grid (8'-0" height).
- SW wall to be aluminum storefront system (10'-0" height).
- All doors to be wood with hollow metal frames.

COST ESTIMATE:

3,100 s.f. X $38/s.f. = $117,800.00

NEW OFFICE SPACE AT PREVIOUS LIBRARY AND EDSPO LOCATIONS - it is assumed that the 900 s.f. at the previous EDSPO location will be reused. The portion within the previous library (approx. 600 s.f.) will require new finishes as follows:

- Provide 3 individual offices and the balance in open office space.
- Carpet and vinyl base.
- Painted gyp.bd./metal stud walls.
- A.C.P. in new grid at 8'-0" A.F.F. with 1-1/2" sound attenuation to 2'-0" beyond both sides of perimeter walls.

COST ESTIMATE:

600 s.f. X $30/s.f. = $ 18,000.00

CUSTOMER SERVICE - Of the 2,700 s.f. allocated for the new customer service, it is assumed at this time that the existing (7) offices will remain utilizing existing finishes (approx. 980 s.f.). The remaining area shall be finished as open office space:

- Carpet and vinyl base.
- Painted gyp.bd. walls.
- A.C.P. in new (approx. 900 s.f.) and exist. (approx. 820 s.f.) grids. Sound attenuation batts over entire open office area.
- Doors shall be wood with hollow metal frames.

COST ESTIMATE:

1,720 s.f. X $30/s.f. = $ 51,600.00

LOBBY - The new lobby will have 1,800 s.f. of renovated space in the existing building. This space shall be finished as follows:

- 12" X 12" paver tiles and tile base.
- Wall fabric on gyp.bd. walls.
- New A.C.P. and grid at 10'-0" height.

COST ESTIMATE:

1,800 s.f. X $45/s.f. = $ 81,000.00

LOWER LEVEL ACCESS - Where the grade beam is removed, a new steel I-beam will be utilized consistent in depth with existing beams. This will bear directly on existing foundation/grade beam. The 18'-0" X 7'-0" opening will be adequate to include a 10'-0" wide ramp and utility access chase. Cost included in demolition figure.

CONCOURSE CONNECTION - The new concourse roof will need to bear on the existing building along the column line 2'-6" back from the face of the wall. This will require cutting away portions of the roof to access the supporting columns and beams as well as roof repair and new flashing.

COST ESTIMATE:

265 l.f. X $35.50/l.f. =	$ 9,408.00
TOTAL ARCHITECTURAL CONSTRUCTION	$456,308.00

HVAC, PLUMBING & SPRINKLER SYSTEM GENERAL DESCRIPTION

AREAS OF EXISTING BUILDING AFFECTED:

a) Lobby - to become Library and Corridor.

b) Customer Service - to become portion of new Lobby.

c) Portion of Library to become Offices.

d) UNEP/GRID, EOSAT and portions of EDSPO and Science and Applications Branch to become Customer Services.

e) Portions of EDSPO and Science and Applications Branch to become Corridor.

f) Cafeteria - to become Offices.

HVAC SYSTEMS:

a) LOBBY - TO BECOME LIBRARY AND CORRIDOR.

Existing Lobby is supplied by a 24" dia. H.V. duct which is adequate for new occupancy. The existing lobby is served by two (2) #6 and three (3) #8 air boxes, for a total of 3900 cfm. The Library is programmed at 3200 sq.ft., making 1.2 cfm/sq.ft. available for re-use. It is anticipated that all of the boxes can be re-used, but none of the ductwork or diffusers. AHU #3 would no longer be used and will be removed. Radiant Panels will be installed along the new west wall. Thermostat will be moved to new locations.

COST ESTIMATE (HVAC):

	DEMOLITION:	CONSTRUCTION:
	$ 2,000.00	
New Distribution System: $3/s.f.		12,900.00
Addition of Radiant Panels: 6 X 700		4,200.00
Temp. Control:		2,500.00
TOTAL	$ 2,000.00	$ 19,600.00

b) CUSTOMER SERVICES - TO BECOME PORTION OF NEW LOBBY.

At present this space is served by four (4) #6B air boxes, each rated at 600 cfm for a total of 2400 cfm for half of the Lobby. This is almost adequate for half of the new Lobby, but will have to be totally re-arranged and supplemented by the new system. In addition, a large vestibule heater will have to be added to protect the new entrance similar to the existing. This vestibule heater cost will be a part of the EOS addition cost. The existing ductwork and registers will be replaced. Controls will be modified & relocated.

COST ESTIMATE (HVAC):

	DEMOLITION:	CONSTRUCTION:
	$ 2,000.00	
New Distribution Sustem: $5/s.f.		9,000.00
Temp. Control:		3,500.00
TOTAL	$ 2,000.00	$ 12,500.00

c) PORTION OF LIBRARY TO BECOME OFFICES.

This 600 s.f. portion of Library is presently handled by a portion of the duct originating from two (2) 6A air boxes, supplying 600 cfm each. Of this amount of air, half of it goes in the new office section with about 1 cfm/s.f. which can be handled. However, the boxes will have to be re-arranged so that one will entirely dedicate to the Office portion. In addition, the existing diffuser & ducts will have to be substantially remodeled.

COST ESTIMATE (HVAC):

	DEMOLITION:	CONSTRUCTION:
	$ 2,500.00	
New Distribution System: $8/s.f.		$ 4,800.00
Temp. Control:		3,000.00
TOTAL	$ 2,500.00	$ 7,800.00

d) UNEP/GRID, EOSAT, AND PORTIONS OF EDSPO AND SCIENCE & APPLICATION BRANCH TO BECOME CUSTOMER SERVICES.

Present space is supplied by one (1) #6B, two (2) #3B and seven (7) #2 air boxes for a total of 2600 cfm for a new programmed space of 2,700 sq.ft., resulting in an air flow of a little less than 1 cfm/sq.ft. This will be re-adjusted upward by the excess air available from the adjacent space. The Customer Service area is developed by partitioning strategies creating a new corridor, and will result in lighting changes and other spacial modifications requiring remodeling of the present air distribution system. It will require substantial relocation of existing air-boxes and diffusers and the addition of new diffusers. It will also require some relocation of thermostats and relocation of control tubing to new box locations.

COST ESTIMATE (HVAC):

	DEMOLITION:	CONSTRUCTION:
	$ 2,500.00	
New Distribution System: $4/s.f.		10,800.00
Temp. Control:		2,500.00
TOTAL	$ 2,500.00	$ 13,300.00

e) PORTIONS OF EDSPO AND SCIENCE AND APPLICATIONS BRANCH TO BECOME CORRIDOR.

In this re-arrangement, approximately 400 square feet of existing EDSPO space and office 1A-35 become corridor required to access new addition. This space is presently served by one (1) #2 and one (1) #8A air box for a total of 1,000 cfm. This is certainly ample air, and by some re-arrangement most of it will be diverted to Customer Services as well as re-assigning control of the air boxes to Customer Service.

COST ESTIMATE: (HVAC)

	DEMOLITION:	CONSTRUCTION:
	$ 2,000.00	
New Distribution System: $4/s.f.		$ 2,800.00
Temp. Control:		1,000.00
TOTAL	$ 2,000.00	$ 3,800.00

f) CAFETERIA - TO BECOME OFFICES.

Existing air handling system can be retained with minor modification to central equipment - AHU #1 and major modifications to distribution system. The supply air quantity is now 7,125 cfm. which will easily handle a new programmed space dedicated to office functions. With a newly created area of approximately 3,550 s.f. This allows for 2 cfm/s.f., which is almost twice what is required for this type of space.

This area presently incorporates food preparation and food serving equipment, exhaust hood & fans, etc. To prepare this area for an office environment, substantial demolition is necessary.

COST ESTIMATE:

	DEMOLITION:	CONSTRUCTION:
	$ 5,500.00	
New Distribution System: $7/s.f.		$ 24,850.00
Temp. Control:		3,500.00
TOTAL	$ 5,500.00	$ 28,350.00

PLUMBING & FIRE PROTECTION:

a) LOBBY - TO BECOME LIBRARY AND CORRIDOR.

I No plumbing changes.
II Substantial modification to overhead sprinkler grid.

Allowance: 40 cts/s.f.
4,300 X 0.4 = $ 1,720.00

b) CUSTOMER SERVICES - TO BECOME PORTION OF NEW LOBBY.

I No plumbing changes.
II Substantial modification to overhead sprinkler grid.

Allowance: 40 cts/s.f.
1,800 X 0.4 = $ 720.00

c) PORTION OF LIBRARY TO BECOME OFFICES

I No plumbing changes
II Modifications to overhead sprinkler grid.

Allowance: 50 cts/s.f.	
0.5 X 600 =	$ 300.00

d) UNEP/GRID, EOSAT AND PORTIONS OF EDSPO AND SCIENCE AND APPLICATIONS BRANCH TO BECOME CUSTOMER SERVICE.

I Remove sill cock & plug C.W. line.
II Modifications to overhead sprinkler grid.

Cost Estimate for I:	$ 300.00
Allowance for II:	
30 cts/s.f.	$ 810.00
TOTAL	$ 1,110.00

e) PORTIONS OF EDSPO AND SCIENCE AND APPLICATIONS BRANCH TO BECOME CORRIDOR.

I Remove Sill-Cock & plug C.W. line.
II Some change to overhead sprinkler system.

Cost Estimate for I:	$ 300.00
Allowance of II: 30 cts/s.f.	
0.3 X 600 =	180.00
TOTAL	$ 480.00

f) CAFETERIA - TO BECOME OFFICES.

I Substantial plumbing demolition:
Removal of three (3) floor drains, removal of all rough-in services projection through walls.

II Re-arranging sprinkler head locations to fit new ceiling layout

Cost Estimate for I:	$ 3,000.00
Allowance for II:	
40 cts/s.f. - 0.4 X 3,500	$ 1,420.00
TOTAL	$ 4,420.00

g) RAMP FROM EXISTING CRAWL SPACE INTO NEW BASEMENT:

I Depending upon the final location of the access opening into the existing crawl space, it will be necessary to relocate existing water and sewer lines.

Allow

ance:

$ 8,000.00

ELECTRICAL DEMOLITION:

CAFETERIA AREA - 3,550 s.f.

- Disconnect and remove all electrical power connections related to food service equipment.
- Disconnect and remove all devices and conduit and wire in walls to be removed.
- Disconnect and remove all existing lighting fixtures.
- Disconnect and remove distribution panel "DPD1" serving kitchen loads.
- Disconnect and remove power panel "PD3" serving kitchen loads.

DEMOLITION COST: $ 3,300.00

LOBBY AREA - 4,300 s.f.

- Remove electric baseboard heat on lobby side of vestibule.
- Removal of lighting fixtures and wiring devices in effected ceilings and walls.
- Disconnect and remove power and communications circuits to security and information desks.

DEMOLITION COST: $ 2,250.00

LIBRARY AREA - 1,200 s.f.

- Disconnect and remove all lighting fixtures.
- Disconnect and remove wiring devices in effected walls.
- Existing floor outlet boxes to remain.
- Existing lighting panel "HA2" and power Panel "PA2" to remain.

DEMOLITION COST: $ 600.00

CUSTOMER SERVICE - 2,400 s.f.

- Remove all lighting fixtures.
- Existing floor boxes serving power and communications circuits to partitions to remain. Blank-off as required in areas no longer needed.

DEMOLITION COST: $ 1,200.00

UNEP/GRID, and EOSAT - 1,200 s.f.

- Remove and relocate lighting fixtures as required.
- Existing outside offices to remain as is.

DEMOLITION COST: $ 600.00

EDSPO - 700 s.f.

- Remove all lighting fixtures.
- Disconnect and remove wiring devices in effected walls.
- Existing floor boxes to remain, blank-off as required in areas no longer needed.

DEMOLITION COST: $ 350.00

SCIENCE & APPLICATIONS - 800 s.f.

- Remove lighting in effected area.
- Remove and relocate telephone cabinet "TA3".
- Disconnect and remove wiring devices in effected walls.

DEMOLITION COST: $ 3,400.00

EXTERIOR PANEL -

- No electrical demolition required.

LOWER LEVEL ACCESS -

- No electrical demolition required.

TOTAL ELECTRICAL DEMOLITION COST: $ 11,700.00

NEW CONSTRUCTION:

OFFICE SPACE AT PREVIOUS CAFETERIA LOCATION - 3,550 s.f.

- New 2'X4' fluorescent lighting fixtures throughout the new space. (50-70 fc average)
- New general purpose receptacles in new office areas. (4 per office typical)
- New telephone outlets in all offices. (1 per office typical)
- New power panel for power to areas. Reuse existing transformer location in crawl space to feed new panel.

CONSTRUCTION COST: $ 31,400.00

CORRIDORS - 2,400 s.f.

- New 2'X4' fluorescent lighting fixtures throughout. (20-30 fc average)
- Electrical connections to card access security locks.

CONSTRUCTION COST: $ 7,000.00

LIBRARY & OFFICES - 3,700 s.f.

- Some existing incandescent down lights shall remain. Reconnect as required. Add lighting fixtures in areas of new ceiling.
- General purpose receptacles.
- Feed new loads from existing power panels.
- New general purpose receptacles and telephone & computer outlets for new offices.

CONSTRUCTION COST: $ 25,900.00

CUSTOMER SERVICES - 2,700 s.f.

- New fluorescent lighting fixtures throughout. (50-70 fc average)
- New general purpose receptacles and telephone outlets for new office areas.

CONSTRUCTION COST: $ 18,900.00

LOBBY - 1,800 s.f.

- New lighting in new A.C.P. ceiling.
- New communications and power circuits to areas required.

CONSTRUCTION COST: $ 12,600.00

TOTAL ELECTRICAL CONSTRUCTION COST $ 95,800.00

COST ESTIMATE SUMMARY

DEMOLITION:

ARCHITECTURAL	$ 72,540.00
MECHANICAL	$ 16,500.00
ELECTRICAL	$ 11,700.00
TOTAL DEMOLITION:	$ 100,740.00

NEW CONSTRUCTION:

ARCHITECTURAL	$ 456,308.00
MECHANICAL	$ 102,100.00
ELECTRICAL	95,800.00
TOTAL CONSTRUCTION	$ 654,208.00

SUB TOTAL	$ 754,948.00
OVERHEAD (10%)	$ 75,495.00
SUB TOTAL	$ 830,443.00
PROFIT (5%)	$ 41,522.00
SUB TOTAL	$ 871,965.00
EXCISE TAX (.0204)	$ 17,788.00
SUB TOTAL	$ 889,753.00
A/E FEES (7%)	$ 62,283.00
CONTINGENCY (10%)	$ 88,975.00
TOTAL	$1,041,011.00

GENERAL BUILDING REQUIREMENTS

General:

The EOS Distributed Active Archive Center (DAAC) building addition must be architecturally harmonious with the existing building. It will consist of a main floor level with the main floor of the existing building and have a 65,000 square foot gross footprint. It will require a lower level to house mechanicals and support equipment. The addition will require a freight elevator and may require a personnel elevator.

The design must provide a single lobby serving both buildings and an atrium is the preferred bridge between the two buildings. The buildings must be interconnected on the main floor and lower levels, but must be isolatable for protection from fire, water, etc., and personnel security.

There should be a minimum number of loadbearing walls. Office areas should be designed to use high quality, sound absorbing, demountable walls. Considerable thought should be given to connection chases, towers, trays, closets, etc.

The structure will require lightning protection. All steel in the structure will be electrically bonded and grounded to earth. Studies on lightning protection an computer grounding may be required. A floor rating of 250#/sq.ft. is recommended.

Main Level:

The floor of the computer center must be elevated 24-inches above the subfloor. Floor coverings may be carpet or tile. If carpeted, metallic filament carpet is required. The A&E should evaluate the tradeoffs of 100 percent raised floor on main level versus raised floor in computer center only. The main level will include:

a. A main computer bay of 10,000 square feet unencumbered by internal vertical obstructions;

b. an area of 1700 square feet adjacent to the computer bay to house roboticized archive storage devices (the devices are not part of the facility);

c. two data analysis laboratories of 1,000 square feet each adjacent to the computer bay to house data display devices; one lab should have audio/visual support;

d. document scanning and reproduction room of 200 sq. feet;

e. general office space for 180 persons at 144 square feet per person with an average of two occupants per office; Charlie will provide draft.

f. five conference rooms (one-600 sq.ft., one-400 sq.ft., three-250 sq.ft.), the 400 sq.ft. room having video teleconferencing capability; **Recommended** 200 sq. ft. A/V Support Room adjacent to both large Conference Rooms.

g. an auditorium facility that will seat 300 people and is subdivisible into three areas; **Mandatory**

h. training room of 1,600 sq. feet, quarter divisible; **Mandatory**

i. library facility of 3,000 sq. feet; **Recommended**

j. lobby of 6,000 sq. feet; **Recommended**

k. cafeteria of +/- 5,500 square feet; options to provide patio area, use atrium, include separable executive dining room. **Recommended** - may be in old building, but should be central to both buildings.

Lower level:

The lower level will provide:

a. A facilities support equipment room of 12,000 square feet (for environmentals, computer cooling and UPS) to house chillers, boilers, auxiliary power units, etc. **Mandatory** - Robin will provide draft.

b. an electronic equipment staging and maintenance area of 2000 square feet, adjacent to the loading dock and freight elevator). **Mandatory**

c. 1,300 sq. feet, on raised floor with two 2-ft. sq. equipment chase, to house electronic communications gear and electrical maintenance lab. **Mandatory**

d. a tape archive area of 12,000 square feet, to be equipped with 2-ft. sq. equipment chase. **Mandatory**

e. lavatory and shower facilities for men and women. **Mandatory**

f. a separate supply or storage room of 2,000 sq. feet. **Recommended**

g. 1,500 sq. foot secure vault with RF grid imbedded. **Mandatory**

h. the balance of the space is to remain unfinished except for paved floor and fire protected ceiling. **Mandatory**

The Lobby

The lobby area must accommodate 50 - 200 visitors at any one time during the day and at least one half of the exit traffic from the theaters. EDC and DAAC staff should not have to use the lobby to traverse between buildings. EROS visitors must sign in at security or reception desk. Visitors may have access to static displays on the wall or on the lobby floor. Video stations will be used to allow visitors viewing of the DAAC computer floor. Other A/V stations may also be used to explain current programs at EDC. The lobby will be self-touring with an area set aside for a pamphlet rack and description board on how to tour the lobby. Carpeting should be considered for the general traffic areas to reduce lobby noise.

Visitors will be allowed access to the lobby, cafeteria, vending and auditorium areas un-escorted. However, they must be escorted by an EROS or DAAC employee to view other areas.

An optional executive waiting area might be adjacent to the main lobby for invited guests and dignitaries to wait for their escorts. This area would be secured from operational areas of either building.

Cafeteria

A single cafeteria will service both the existing and new building. It should be located near the lobby area with access to the visitor auditorium. The cafeteria will operate Monday - Friday, from 7:00 am to 4:00 pm. It will serve breakfast meals from 7:00 - 10:00 am, and lunch entrees from 11:00 am - 1:00 pm. The cafeteria will be open to the public. The cafeteria could expect to serve 150 - 250 breakfast meals and 250 - 350 lunches each day, not including the general public. Center employees will schedule their meal times to avoid congestion. Therefore, the cafeteria would not have to accommodate the entire staff at one sitting.

The cafeteria should include dish washing equipment adjacent to the food preparation area to support use of china and flatware. The service area must be large enough to handle a "scramble" style service line and island set up for both hot and cold service. The cash register area should be designed to service two lines from a single register.

The dining area should incorporate natural lighting and have access to an outside patio area. The dining area should be flexible enough to change the seating layout and walls to accommodate special events as a single large room as well as smaller bay areas the majority of the time. An executive dining area adjacent to the main area with seating for up to 30 people is desirable. This executive room could include A/V and data communications hookups for conference activity. A vending area would be common to both dining areas and separate from the service lines. The vending area must be accessible 24 hours per day, 7 days a week.

The following are minimum space recommendations for each subcomponent of the cafeteria:

*Food Prep. & Dish Washing	=	1000 sq.ft.
*Service Lines & Islands	=	900 sq.ft.
Main Dining Room Area	=	3000 sq.ft.
Executive Dining Area	=	600 sq.ft.
Outside Deck or Patio	=	600 sq.ft.

* These areas need to be securable during non-service hours.

The Visitor Auditorium

The visitor auditorium must have an overall capacity for 300 people as a single auditorium. The auditorium area will have the flexibility to be broken down into three mini auditoriums, each mini auditorium would handle up to 100 people. The auditorium floor would be sloped to optimize viewing. The interior walls will be moveable and sound proof. Each mini auditorium will be wired for A/V and data communications lines. Theater seats will include flip-up desks for both right and left handed people. A landing area will also be available in each auditorium to accommodate wheel chairs.

The auditorium will be opened as a single room at least 4 times a year. The rest of the time it is expected that one or more of the smaller auditoriums will be used daily to support walk in visitors with a standard video presentation. The remaining portion of the auditorium may be used to conduct staff meetings and other informational activities. The auditorium should be located directly off the lobby with exits to the lobby and possibly the cafeteria.

The Conference Rooms

A total of five conference rooms will be required in the new building. One will be designated as an executive conference room and will be 600 sq.ft. in size. The executive conference room will include a drop-down screen and video projection unit, and access to the local area network for computer demonstrations. The room will include conference tables and executive chairs to seat at least 30 people.

A second conference room will be equipped with complete audio and visual teleconferencing capabilities. The room will be 400 sq.ft. in size and incl. and transmission capabilities to the auditoriums. This conference room might share access to the projection room of the executive conference room for support equipment.

The three additional conference rooms of 250 sq.ft. each will be placed around the DAAC to support operational meetings within the working units of the DAAC.

All of the conference rooms will be carpeted and will have sound deadening fabric on the walls. The rooms will be wired for telephones and a minimum of one network jack per room to accommodate access to the DAAC's computer network. Built in audio visual equipment will be provided to meet the technical requirements of the EROS Engineer.

Provide a 200 sq.ft. audio/visual Support Room between the two large Conference Rooms.

Displacements

The space and proximity requirements of the new auditorium, central cafeteria and expanded lobby/visitor center may displace the following operations:

Customer Service = 2 offices, file room and 1800 sq.ft. of general work area.

The Technical Reference Unit = 1180 sq.ft. of library and general research and work area.

The Executive Conference Room = 780 sq.ft. of conference space and 180 sq.ft. of A/V support service.

At least four executive offices = Four 140 sq.ft. offices and 600 sq.ft. of general work area. (EOSAI, UNEP/GRID, PDCO)

Potential Impact to DDPS and EDSPO for additional space, but not totally displacing their operations.

Customer Service may be moved off-site during the demolition and construction phase of the new building. But due to their customer support of lobby visitors, they should be located near the lobby area in either the old or new building. This operation should have about the same space in the new building as it had in the existing facility.

The Executive Conference Room will be replaced by multiple conference rooms in the new building.

Post Construction

The old cafeteria in the EROS wing will be available for remodeling upon the completion of the new cafeteria. This area may be parcelled up into additional offices for Contractor Support, CSB and or an ancillary break room.

DAAC SPACE ALLOCATIONS 3/28/91

MAIN FLOOR			LOWER LEVEL		
GROSS SPACE		65,000	GROSS SPACE		65,000
CIRCULATION 15%		55,250	CIRCULATION 15%		55,250
ATRUIM		5,000	ATRIUM		5,000
ADJUSTED NET SPACE		**60,250**	ADJUSTED NET SPACE		60,250
PUBLIC AREAS	16,000		PUBLIC AREAS		
LOBBY	6,000				
CAFETERIA	5,500				
AUDITORIUM	4,500				
		44,250			**60,250**
COMPUTER CENTER	14,000		COMPUTER CENTER	27,400	
Freight Elevator	100		Freight Elevator	100	
Shift Supervisors Office	200		Communications Room	1,000	
Computer Room	5,400		Communications Maintenance Work Room	300	
Archive (robot) Room	1,700		Equipment Staging/Storage Room	2,000	
Console Operations Room	600		Archive	12,000	
Production Scheduling	500		Mechanical Room	12,000	
Peripheral Operations Room	2,000				
Support Services Room	500				
Supplies Storage Room	300				
Hardware Maintenance Work Room	500				
DAAC Testing Laboratory	1,000				
DAAC Applications Laboratory	1,000				
Break Room	200				
		30,250			**32,850**
DAAC SUPPORT SPACE	6,550		DAAC SUPPORT SPACE	4,100	
LIBRARY	3,000		DISSEMINATION	600	
TRAINING ROOM	1,600		VAULT	1,500	
EXECUTIVE CONF ROOM	600		PRODUCT STORAGE ROOM	2,000	
TELECONFERENCING ROOM	400				
CONFERENCE ROOMS (3X250)	750				
DOC SCANNING/REPROD	200				
		23,700			**28,750**
OFFICE SPACE	13,968		OFFICE SPACE	0	
DACC MANAGEMENT STAFF	864				
O&M CONTRACT MNGT STAFF	576				
C/D CONTRACTOR STAFF	1,440				
VENDOR ENGINEERING	432				
VISITING SCIENTISTS/ENGIN	2,880				
COMPUTER OPERATIONS	144				
TECHNICAL SUPPORT	1,584				
SOFTWARE DEVELOPMENT	1,440				
NETWORK MANAGEMENT	864				
DATA MANAGEMENT	576				
CUSTOMER SERVICES	144				
SCIENCE SUPPORT	3,024				
		9,732			**28,750**
BAY/OFFICE CLUSTER SPACE	7,300		BAY WORK SPACE	0	
DAAC MANAGEMENT STAFF	500				
O&M MANAGEMENT STAFF	300				
COMPUTER OPERATIONS	500				
TECHNICAL SUPPORT					
SOFTWARE DVLPMENT					
NETWORK MNGMNT					
DATA MANAGEMENT	2,500				
CUSTOMER SERVICES	2,500				
SCIENCE SUPPORT	1,000				
SQ. FT. REMAINING		**2,432**	SQ. FT. REMAINING		28,750

SPACE MAY BE USED TO INCREASE THE NUMBER OF OFFICES IN OFFICE COMPLEXES OR TO ADD TO THE SQUARE FOOTAGE OF CERTAIN MANAGERS OFFICES

Location of the Computer Center
The Computer Center will be centrally located within the DAAC. It will occupy space on both the main and lower level of the DAAC.

Freight Elevator
A freight elevator shall connect the main and lower level. The elevator landings shall be located within the confines of the Computer Center. Its location within the Computer Center shall be conducive for movement of supplies, equipment, and archived data between the floors.

The elevator will have a minimum loading capacity of 10,000 lbs.
The car size will be 10' by 10', 100 sq ft.
The elevator will meet all code reguarding safety and construction.
Elevator doors shall permit the loading of pallet sized freight.

Security Requirements
All areas within the Computer Center with the exception of the Test and Visualization Laboratories will be under access restrictions.

Doors
The number of doors to the Computer Center shall be limited to those necessary to meet fire code and to conduct business operations. All mainfloor areas considered as restricted access areas shall be entered through a primary central passage point. This primary access control point shall be located by the Support Services room. All Computer Center doors will be controlled via a card key security system. An emergency power off control will be located at each exit of the Computer Center.

All doors leading to mechanical, communications, equipment staging, equipment storage, and archive rooms; all of which are located on the lower level, will be under the control of the card key security system.

Doors will be constructed of metal or solid wood. In the case that the doors may require glass for safety purposes, the glass will contain wire mesh.

Windows
Windows will be inoperable. The glass will have embedded metal mesh or other breakage resistant glass and all fastening devices will be located to the inside of computer room.

Subfloor
Since the entire DAAC main floor will be constructed with a 24" raised carpeted floor, significant barriers separating areas designated as restricted (card-key access) and non-restricted access will be installed. This will provide a physical security safeguard and will provide a baffle for those areas requiring the subfloor to be a plenum for air-conditioning. Water detectors will be installed in all areas where the subfloor is used as an A/C plenum.

The Computer Center will be equiped with the following:
intergrated paging system
an emergency lighting system
a central vacuum system

MAIN FLOOR COMPUTER CENTER

The entire Computer Center will be constructed on 24" false floor. Carpeted floor tile will be used throughout. The carpet selected must be specifically designed for computer rooms, with long wear and static electricity resistant capibilities. The facility will be constructed to include a floor loading consistent for the installation of multiple CRAY YMP class supercomputer(s) and digital archive magnetic tape robot systems.

The perimeter walls of the Computer Center will be free of glass except as required for safety purposes within entrances and exits and a large viewing area of the computer room along a corridor.

The internal walls, within the Computer Center, seperating the work areas/rooms as defined, will be constructed such that the upper half of the walls are glass.

A ceiling height of at least 8 ft minimum is to be used for all main floor Computer Center rooms. However, the Computer and Archive Rooms may have 10 ft or higher ceilings.

Within the confines of the main floor Computer Center, the following work/support areas will be constructed: While it is envisioned that the Computer Room will be seperated into various support, archive or processing rooms, these rooms as a whole should be constructed such as to allow a high degree of flexibility in requards to subsequent facility modifications.

Computer Room

Approximately 5400 sq ft of floor area will be required for computer equipment consisting of mainframe computers, front-end processors, disk storage subsystems, and other system components which require minimal operation attention and/or intervention. All inner walls of the Computer Room should be acoustic-surfaced. The Computer Room should be free of structural columns. The Computer Room will have computer environmental controls and compatible fire detection/suppression systems. Consideration should be given to locating office space required for hardware engineers and Computer Operations Management Staff near the computer room. Additionally, space defined as Archive should be located next to the Computer Room.

Archive Room

The Archive Room will occupy 1700 sq ft of floor area within the Computer Center. The Archive Room will house a robot tape storage system where newly aquired and processed data will be stored and accessed by the computers within the Computer Room. The Archive Room will be located adjacent to the Computer room, sharing a common wall which shall be free of structural columns. The Archive Room will have computer environmental controls and compatible fire detection/suppression systems. The wall seperating the Computer and Archive Rooms should be considered optional. Operator support of the robot should be minimual. Tasks such as cleaning of tape drives, loading of raw stock tape and removal of aged archive data tape for transport and long term storage in the lower level archive is envisioned.

Console Operations Room

The Console Operations room of approximately 600 sq ft will house the master operations consoles of the computers in the Computer Room and be the work area for the Console Operaters. The Console Operations Room will have computer environmental controls and compatible fire detection/suppression systems. The Console Operations Room will be equiped with controlled lighting. This room should share a common wall with the Computer Room and the Production Scheduling Rom. All inner walls of the Console Operations Room should be acoustic-surfaced.

Production Scheduling Room

A Production Scheduling Room of 500 sq ft will house activities associated with scheduling work for processing through the Computer Centers machines and maintaining interfaces with the other DAACs and the System Control Center in Maryland. The Room will house workstations for up to 4 schedulers. The room will contain an office environment and be equipped with controlled lighting. The room should be located near the Support Services Room and the Console Operations Room.

Peripheral Operations Room

The Peripheral Operations Room of approximately 2000 sq ft will house all input and output devices (except disk) attached to the computers located in the Computer Room. Magnetic tape drives of various types, printer, plotters, film recorders, and other devices requiring focused operator attention to produce products will be located in this room. The room will house dense pack cartridge tape shelving for temporary work files. The room will have computer environmental controls and compatible fire detection/suppression systems. The room should be located near the Support Services Room and the Supplies Storage Room for work flow purposes. Consideration should also to given for a location near the freight elevator for ease of moving product to the Dissemination Room. Additionally, a location adjacent to the Console Operations Room is desirable to permit cross utilization of human resources.

Support Services Room

A Support Services Room of 500 sq ft will house activities associated with Computer Center customer interaction and user assistance. Employees within this room will control the primary access into the Computer Center. The Support Services Room may be divided into individual work areas to support the following: Help Desk, Computer Center reception, and input/output support. The room will contain an office environment. It will be located on a Computer Center perimeter wall. Close proximity to the DAAC Testing Laboratory is important to allow Support Services Staff to attend miscellaneous peripherals found in this Lab.

Supplies Storage Room

The Supplies Storage Room of approximately 300 sq ft, located adjacent to the Peripheral Operations Room, will be used to store all expendable computer supplies. Items such as plotter papers and mylars, magnetic tape, optical disks of varying types and other miscellaneous supplies to support Computer Center operations. Consideration should be given to locating the room next to either the freight elevator or to a main corridor.

Hardware Maintenance Work Room

The Hardware Maintenance Work Room will be used as work space in support of the peripheral operations with the Computer Center. The room should be approximately 500 sq ft located next to the Peripheral Operations Room. The room will have a computer room environment. The room must be plumbed with hot and cold water, and have a sink suitable for the washing of parts in support plotters and other support peripherals. The room will have ample outlets for test equipment and peripheral servicing. It shall be configured with a large work bench and floor to ceiling documentation shelving 10 feet wide and 1 foot in depth. It shall also be used to store spare parts for both the computers and their peripherals. This room shall not have an external Computer Center enterance.

DAAC Testing Laboratory

The DAAC Testing Laboratory of 1000 sq ft is a multi-purpose room supporting end user graphics output via plotters, specialized printers, scientific workstations; sophisticated visualization devices; and some input/output magnetic tape and optical disk capability. The room shall be capable of being divided into three separate rooms via collapsible walls. Independent adjustable lighting shall be within each temporary room. The Laboratory will have unrestricted access to the user groups it is designed to support. For this reason, the DAAC Testing Laboratory will not have any direct access to the restricted areas of the Computer Center. The Laboratory should be located next to the Support Services Room with a hall way leading directly to the primary entrance separating the two rooms. The Laboratory wall along this hallway should be constructed with the upper half as glass. This third of the Laboratory will contain the specialized peripherals described above. The room will have an entrance point into each temporary room. The Laboratory will have an office environment. It is envisioned that this room will

be used by visiting scientists and engineers and by inhouse Support Scientists, Support Programmers, and Test Analysts and Quality Control Analysts.

DAAC Applications Laboratory

The DAAC Applications Laboratory of approximately 1000 sq ft is an open laboratory supporting in-house and visiting scientists' research via scientific workstation and high resolution visualization devices. The Laboratory will have unrestricted access to the user groups it is designed to support. For this reason, the Data Visualization Laboratory will not have any direct access to the restricted areas of the Computer Center. The room shall be capable of being divided into three separate rooms via collapsible walls. Independent adjustable lighting shall be within each temporary room. The laboratory will have an entrance point into each temporary room from a corridor. The location of this Laboratory within the Computer Center should correspond with the location of the in-house and visiting scientist office areas. The Laboratory will have an office environment. The room shall function independent from the Computer Center.

Shift Supervisors Office

The Shift Supervisors office of approximately 200 sq ft will be located in an area which will allow ease of access to all Computer Center rooms where the majority of Computer Operations employees reside. Specifically, this includes the Peripheral Operations and Console Operations Rooms. The room will be fitted with drapery to allow privacy during employee interviews or visibly to major areas of the Computer Center to include the Computer Room. It shall also be used for daily interface meetings for the Computer Operations staff. The room will have an office environment.

Computer Operator Break Room

A break room of 200 sq. ft. shall be constructed within the Computer Center. Eating and drinking will be permitted in this room. This area shall be adjacent to the Operator console and peripheral rooms and Shift Supervisor office. This room will have office environmental controls. This room will accommodate timekeeping, bulletin boards and other employee related interfaces.

LOWER LEVEL COMPUTER CENTER

The location of the lower level Computer Center will be directly beneath the main floor Computer Center.

The perimeter walls will be free of glass except as required for safety purposes within entrances and exits.

An unobstructed ceiling height of at least 8 ft is to be used for all lower level Computer Center rooms.

The floor will be tiled.

Within the confines of the lower level Computer Center, the following work/support areas will be constructed:

Communications Room

A Communications Room of 1000 sq ft will be constructed directly beneath the Computer Room on the Main Floor of the Computer Center. The room will be constructed with 12" of raised floor with an unobstructed ceiling height of at least 7 ft from the raised floor to the ceiling. The room will house communications equipment such as multiplexers, modems, switches, and test equipment. The room will have a computer room environment.

Communications Maintenance Laboratory

The Communications Maintenance Laboratory will be used as work space in support of the equipment located in the Communications Room. The room should be approximately 300 sq ft located next to the Communications Room. The room will have a computer room environment. The room will have ample outlets for test equipment and equipment servicing. It shall be configured with a large work bench and floor to ceiling documentation shelving 10 feet wide and 1 foot in depth.

Equipment Staging/Storage Room

The Equipment Staging/Storage Room of approximately 2000 sq ft will be used as a work area to pack, unpack, assemble and store computer equipment. To meet these needs, the room must have a computer environment and a location which provides easy access to the both the loading dock and freight elevator.

Archive

The Archive will be a 12000 sq ft room with environmental controls suitable for a digital archive environment meeting CLASS 1 corrosion specifications.. The room will be fitted with tacked space saver shelving. The room should be designed such that support columns will cause minimal interference with mobile shelving systems. The floor should be tiled. The Archive will be used as a work area where tape cleaning, winding and other archive maintenance activity will be performed.

Mechanical Room

The Mechanical Room of 12000 sq ft will house power conditioners/supplies, UPS, chillers and other equipment necessary to support both the computers within the Computer Center and the enviroments of the DAAC. The Mechanical Room will be have a Mechanical Room environment. It shall be located directly beneath the Computer Room of the main floor Computer Center. It must have ready access to the loading dock. The walls seperating the mechanical room and other rooms within the computer center will be constructed using sound proofing materials and/or techniques which will reduce the noise within adjacent rooms to levels appropriate for an office enviroment. The ceiling height of 15' minimum is required to accomodate the enviromental control systems of supercomputer class machines.

DESCRIPTION OF THE DAAC VAULT 3/20/91

Location of the Vault

The Vault will be located in the lower level of the DAAC.

Vault

The vault will consist of approximately 1500 sq. ft.and will be constructed as follows:

Walls shall be of poured concrete full height from floor to ceiling (main floor structure), with embedded RF grid.
The vault will contain provisions for HVAC which will meet Vault environmental and security specifications.
There shall be but one door of metal or solid wood construction.
Vault will contain grounding which is intergal to the main facility ground.
Vault will have 12" carpeted raised floor throughout.
Considerations will be given to post construction installation of additional security devices as defined.