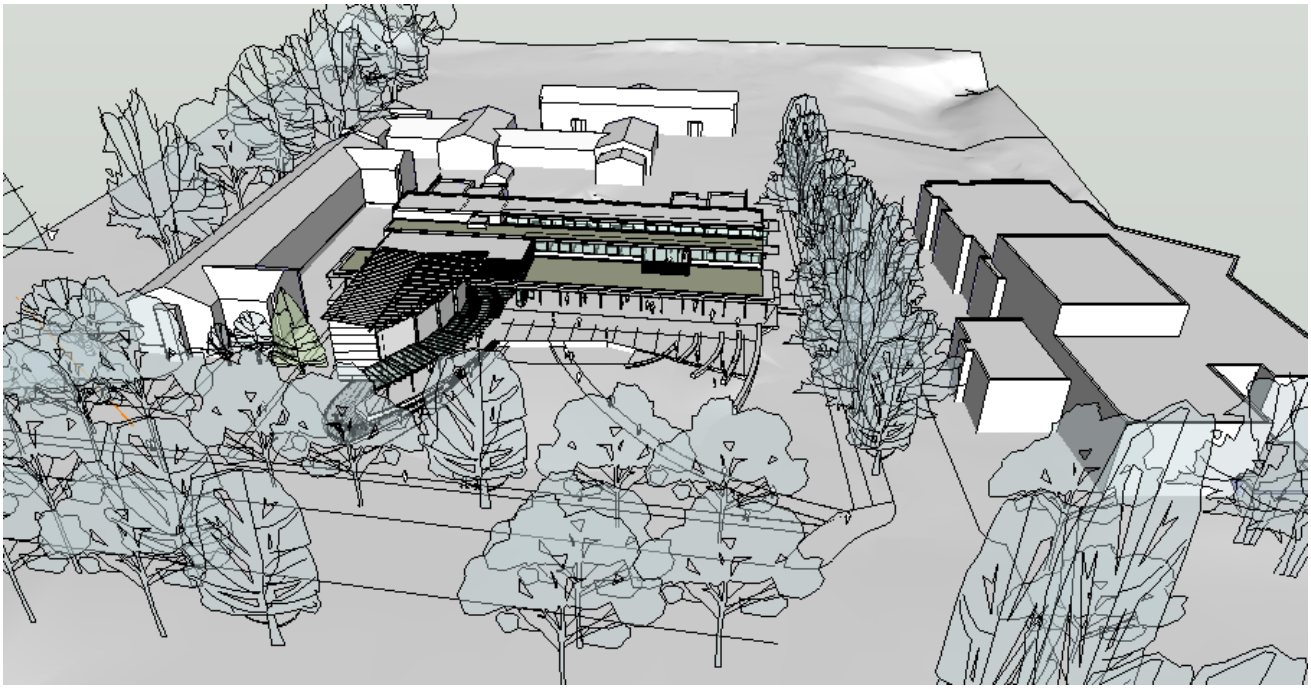
FAP

Facilities Audit Program
Survey of Building Conditions in Higher Education
February 2016



ARKANSAS DEPARTMENT OF HIGHER EDUCATION

http://fap.adhe.edu

Facilities Audit Program (FAP)
Survey of Building Conditions in Higher Education
February 2016

Table of Contents

Introduction

This book contains a description of the Arkansas Department of Higher Education's Facilities Audit Program (FAP), to be used by institutions to document and produce their critical maintenance capital-funding request for the 2017-19 biennium. Users will find in this book instructions for submitting critical maintenance requests and instructions for using the software.

The Arkansas Department of Higher Education (ADHE) and State Building Services (SBS) staff developed the Facilities Audit Program. SBS no longer services the schools which leaves ADHE alone to maintain the program. FAP represents a continued development of the facilities audit software.

The program was redesigned in 2008. The new web-based program allows institutions to view, revise, and input data through a secure website. There is no software to install and no data to transfer between ADHE and the institutions. Any computer with an internet browser and Adobe Reader can be used to complete FAP. Users who are experiencing problems may call ADHE staff for software help.

Summary of Procedures

The recommendations of the Arkansas Higher Education Coordinating Board for critical maintenance funding in the 2017-19 biennium will be based on data developed during the following steps:

1. Inspection of each building by the institution's physical plant staff.
2. Entering revised building system data into the FAP database and, where applicable, completing each data element for each building record contained in the institution's building inventory. A record should be added for any building, which is in use but not included in the established building records, or for new construction which is scheduled to be in use *by the end of fiscal year 2019*.
3. Development by the institution of a priority listing of projects and completion of the Maintenance Priorities Report. This report should be printed from the FAP program and a signed copy sent to ADHE.
4. Identification by ADHE of the most critical maintenance requirements statewide, and formulation of staff recommendations to the AHECB.

Capital Request Deadline

Institutional requests for critical maintenance and renovation/construction capital fund requests are due at the Arkansas Department of Higher Education, Institutional Finance, no later than April 4, 2016. Institutions should submit updated **Facilities Audit Program** reports to support their requests no later than **April 4, 2016**. Forms and instructions for completion of renovation/construction capital requests (other than Critical Maintenance) have been emailed to each institution.

New Features of FAP

- Previously submitted building inventories and needs have been provided. Needs data is automatically aged to January 2016. **All data in the new version of FAP is LIVE! All changes are being made to the FAP database and cannot be reversed.**
- Reports can also be sorted by row headings and exported to the users local computer as either

an Adobe PDF or Microsoft Excel file.
- Five new building functions were added for 2008 to allow for more accurate description of each buildings use. The five new functions are: Apartment Building, College Dorm (4 or more stories), Computer Center, Daycare Center, and Hotel.

Capital Funding Priorities for the 2017-19 Biennium

With an approximate plant replacement value over $5.4 billion, Arkansas higher education must continue to protect and improve its investment in plant facilities, equipment, and library holdings/technology. In particular, public higher education in Arkansas needs to strategically adopt emerging technologies available for instruction, library resources, and communications infrastructure. Furthermore, perpetual investments need to be made in critical maintenance to increase both plant longevity and safety. The Arkansas Higher Education Coordinating Board will request funding from the General Improvement Fund in the 2017-19 biennium within the following capital funding priorities:

- Technology infrastructure improvements including installations or upgrades of local area networks (LANS); campus infrastructure to support increased bandwidth; and instructional technology equipment for classrooms, laboratories, and distance learning delivery systems.
- Critical maintenance projects where "critical" needs are defined as those which must be addressed before the end of 2019 and which, if neglected, could result in substantial damage to the structural integrity of a building, or needs that are related to the imminent failure of building systems such as HVAC, electrical, and plumbing. In addition, critical maintenance projects include those associated with ADA compliance and/or safety needs.
- Improvements in instructional, research, and clinical equipment as well as library holdings/technology.
- Renovation of existing facilities to address changing program needs.
- New construction of facilities when the renovation of an existing building is either not cost effective or is not an option, e.g., new space to address enrollment growth.

Institutional funding requests should be constructed within the context of the above statewide capital funding priorities according to each institution's capital needs.
The following types of projects will **not** be considered:

- Renovation, repair, or construction of facilities primarily used for auxiliary projects; only the educational and general portion of projects having mixed use will be considered for state funding.
- Projects related to the operation of a student bus or transportation service.
- Parking lots.

Such projects should be funded by institutional revenue bonds, user fees, or from other non-state funds.

Uses of FAP data

FAP data will support institutional requests for state funding of the critical maintenance needs of their educational and general buildings. FAP data will also be used as part of the funding models in determining an institutions operating funds need.

Users will enter and update building data, including maintenance needs data. The costs of those maintenance needs are calculated by FAP in the same way they were calculated in previous versions of FAP, and except for a seismic adjustment this method is uniform across all institutions. *Critical maintenance* needs, however, must be calculated *manually* and input as a dollar value to permit users to reflect the actual regional costs of the proposed critical maintenance project with their unique

building conditions.

Users are also requested to prioritize their critical maintenance needs, indicating which needs are most urgent.

Critical Maintenance Request

When designating critical maintenance and the priorities of the various projects, please keep the Coordinating Board's **definition of critical maintenance** in mind:

> Critical maintenance needs are those needs which must be addressed before the end of 2019 and which, if neglected, could result in substantial damage to the structural integrity of the building, or as those needs which are related to the imminent failure of building systems such as HVAC, electrical, plumbing, etc. In addition, critical maintenance projects include those associated with ADA compliance and/or safety needs.

ADA modifications are considered to be part of an institution's maintenance needs and are included in FAP as a building system. ADA cost estimates are calculated automatically if a value for a need is input in the ADA needs area of the program. If no ADA modifications are required, leave the ADA fields blank.

Infrastructure needs, such as the repair of utility tunnels, sewer systems, etc., may also be included in your critical needs. *Do not attempt to include infrastructure needs in the FAP database*. The database was not designed to include infrastructure items, and attempts to make those items fit into the database are not effective.

Requests for infrastructure maintenance should be included with your bound capital construction requests that will be sent under separate instructions by ADHE.

All public institutions of higher education should review existing building audits and enter any changes to building data since 2014 to the FAP database. Be sure that **all buildings** are included in the inventory, including both **educational and general** buildings and **auxiliary enterprise** buildings. Each building must be evaluated, and the institution's FAP data updated. Be sure to include information reflecting maintenance, renovations, and systems replacements achieved since the previous completion of FAP. The updates to FAP will generate maintenance needs costs that should be somewhat different from those reported in institutions' previous FAP submissions, due to changing building conditions and updated construction rates.

Buildings under construction and planned to be on-line by the end of the second year of the budgeted biennium (June 2019) should be entered into the FAP database. These buildings will not have any needs associated with them, and building needs data need not be entered. The addition of these new buildings or additional square footage in the FAP inventory, however, will be the source for determining educational and general square footage funding for the next two years.

Building Evaluation

The physical condition of institutions' facilities is the basis for the Coordinating Board's critical maintenance recommendations, and the current replacement value (CRV) calculated by FAP supports any funded depreciation recommendation, which may be included in institutional operating

budgets. The condition of facilities statewide is described by the FAP data, and it is extremely important that conditions be documented in a standard manner.

Institutional Request and Submittal

One hard copy of the **Maintenance Priorities** report must be submitted by **April 4, 2016.** The report contains a rank order list of critical maintenance needs by building, with the institution's priorities ranked from highest to lowest. This report must be **signed by the President or Chancellor.**

Mail completed request document to:

Charlene Williams, Institutional Finance
Arkansas Department of Higher Education
423 Main, STE 400
Little Rock, Arkansas 72201

Institutions' priority requests will be reviewed by staff members of ADHE.

Users needing help with FAP should contact Chandra Robinson – via phone at (501) 371-2024 or email at Chandra.Robinson@adhe.edu.

FAP: Facilities Audit Program Overview

The objective of the Facilities Audit Program (FAP) is to document the evaluation of building conditions on each campus and to provide support for institutions' requests for maintenance funding for educational and general facilities. FAP's primary purpose documents the building evaluation process as support for institutions' **critical maintenance requests and any funded depreciation recommendation in operating budgets**.

FAP is based on a model of facilities management proposed by APPA: The Association of Higher Education Facilities Officers. The facilities audit process includes institutional examination and documentation of buildings' and systems' conditions and ages, and the entering of revised building information into the FAP database.

FAP is a Web-based program which leads building evaluators through a series of screens for input of information that will generate the current replacement value of each building and calculate cost estimates of maintenance needs based on the expended useful life of component systems.
Instructions for using the FAP software are included beginning on page 7 of this manual.

FAP calculates maintenance needs cost estimates by building system through reference to various supporting look-up tables which are part of the database. The data contained in these tables or schedules were developed from Means cost data and SBS experience with construction and material costs in Arkansas. A building's total maintenance needs cost is based on the expended useful life for each system and subsystem in the structure.

FAP automatically calculates maintenance needs, but **critical needs** must be **calculated manually** and a **cost value entered for every system determined to be in critical need** of replacement or repair. All critical needs are deleted before the data is released to institutions for the new biennial survey.

Building Description

FAP calculates several numerical values, which are essential to the description of each building. These include the current replacement value (CRV), the maintenance need, the critical maintenance need, and the Facility Condition Index (FCI).

The **current replacement value (CRV)** estimates the cost of building a comparable, but modern, structure at present day construction costs (design and engineering fees are not included in this estimate). The CRV is calculated by estimating the cost per *gross* square foot by building function. **NOTE:** Multiple building functions are recognized in the calculation of the CRV. The predominant building function determines the component multipliers used to calculate maintenance needs.

The total **maintenance need** is another value used to describe buildings. This is an estimate of "scheduled" maintenance needs and is calculated for each building system by the "expended useful life" method which takes into account the aging of systems in relation to their expected useful lives.

When entering information into the database, the evaluator is given the opportunity to indicate **critical maintenance needs** associated with each system. ("Critical" need is defined on page 4.) The critical need must be manually calculated after the "maintenance need" and the result is entered to the database. The critical need may be a value, which is the same, more, or less than the maintenance need. Critical need cost estimates may be calculated by the "expended useful life method" (Method

#1) or by one or a combination of three other methods described in Appendix A.

Total maintenance needs costs (excluding the critical maintenance cost) contribute to the calculation of a **Facility Condition Index (FCI)**, which describes the condition of each building as a ratio of maintenance needs to the total current replacement value of the building. This index is a way to describe the extent to which the useful life of a building's systems has been depleted relative to the building's current replacement value.

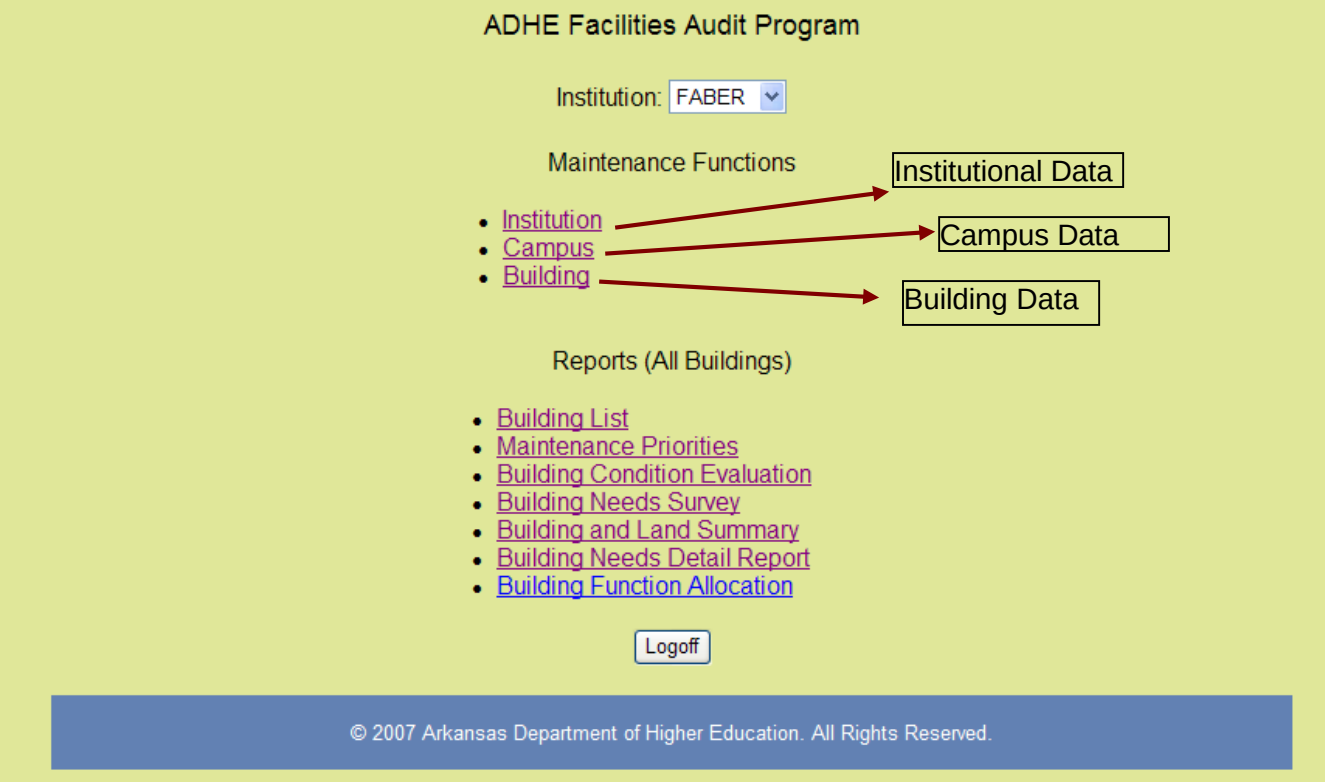
Users Guide to FAP Online

All FAP data will be input through a secure website http://fap.adhe.edu/. The 2014 data is currently in the FAP database and has been "aged" to 2016. All changes made through the web are made to the **LIVE** FAP database. Changes are not reversible. In most cases the data needed to complete FAP has not changed from previous versions.

Username and Password

The Chief Fiscal Officer of each institution will be emailed a username and password for the FAP website. The new version of the program does allow for multiple users on the same campus. To establish additional username and password for staff on campus please email your request to Chandra.Robinson@adhe.edu. Include the first and last name of the user and the email address of the user. Multiple users may enter data into the database simultaneously. Care should be used so that users are not editing the same building simultaneously.

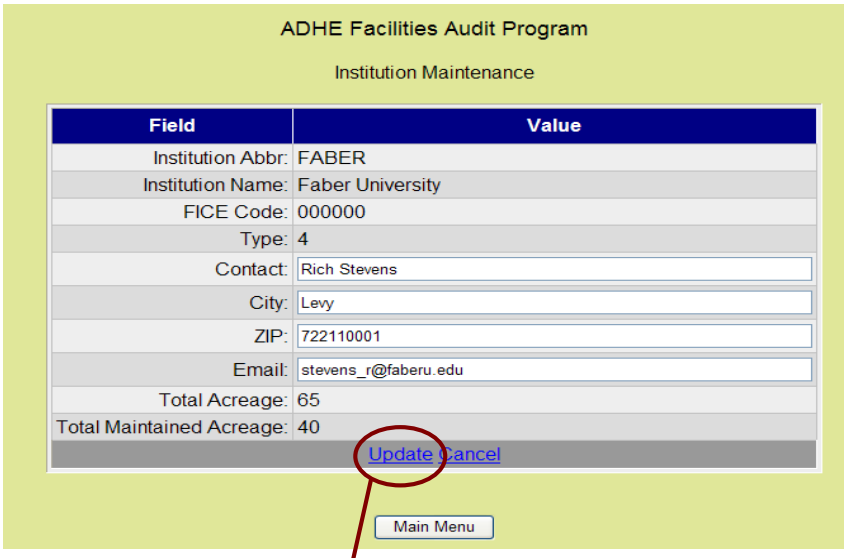
Below is the Main Menu for FAP. Check to be sure that your Institution is displayed in the drop-down menu before proceeding. The Institution, Campus, and Building buttons are used to direct the user to the forms for editing the related data. The remaining buttons are used to view reports for the entire institution and all buildings at the institution.



It cannot be stressed enough that all data is live on the ADHE server and all changes are being updated in real time.

Institutional Data

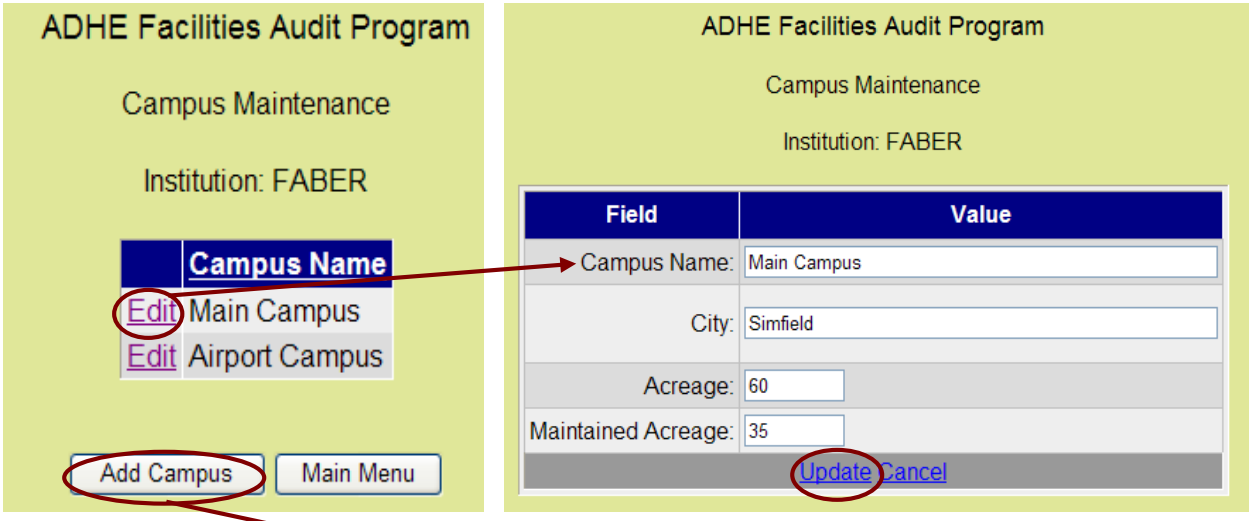
The Institution screen displays information regarding the institution as a whole. Editing may be done to the contact person, email address, city, and zip code. The Total Acreage and Maintained Acreage are updated based on values entered on the Campus Screen.



After making changes, be sure to click Update. This applies throughout the FAP program.

Campus Data

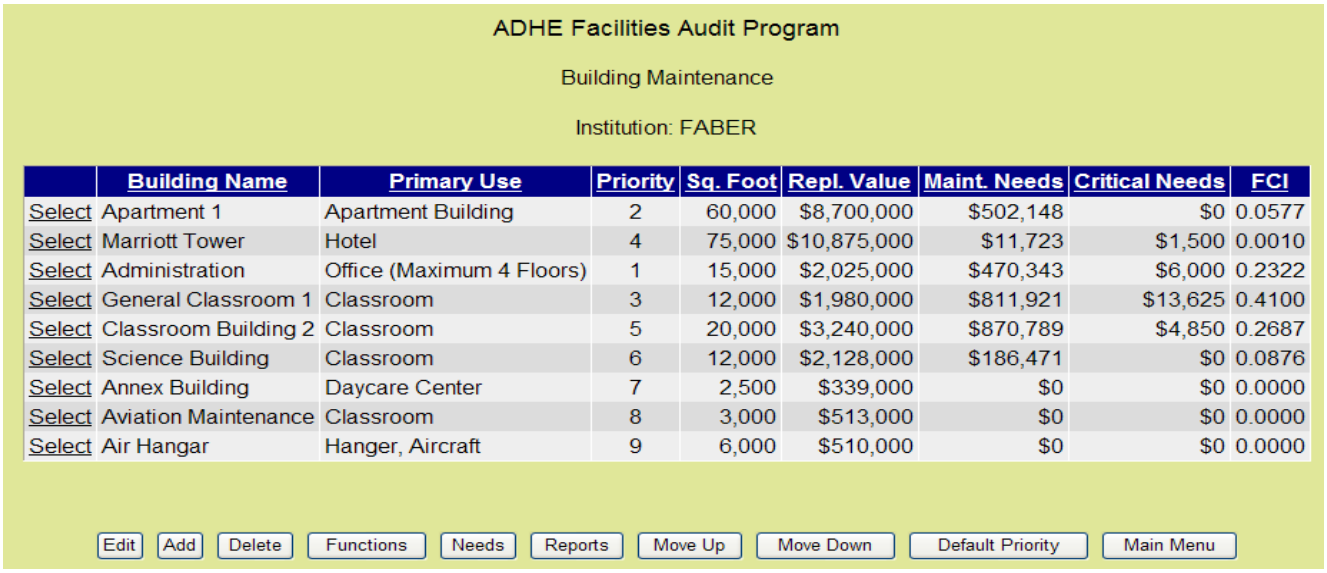
From the Main Menu, clicking **Campus** will take you to the Campus Maintenance screen. Here you can Add or Edit existing campuses. You will need to enter the campus name, city, acreage, maintained acreage, and when adding a new campus the seismic multiplier.



To **add** a new campus, click the **Add Campus** button on the Campus Maintenance Screen.
It is suggested that a new campus be added when an institution has locations in multiple cities. Multiple sites within one city do not require a second campus. Universities which operate a site that was formerly a Technical Institute must use a separate campus for the former Technical Institute.

Building Data

From the Main Menu, clicking the **Building** button will enter the **Building Maintenance Screen**. From this screen the user may edit, add, and delete buildings, as well as adding/changing building functions, viewing reports by building, and setting maintenance priorities.



ADHE Facilities Audit Program

Building Maintenance

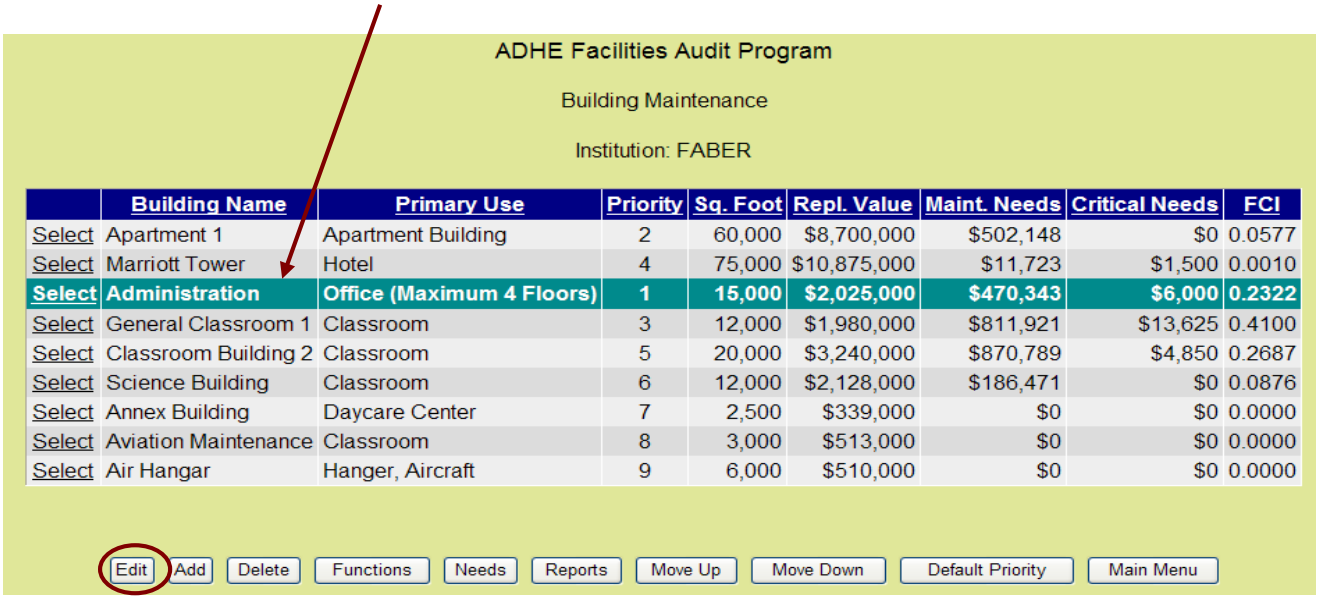
Institution: FABER

	Building Name	Primary Use	Priority	Sq. Foot	Repl. Value	Maint. Needs	Critical Needs	FCI
Select	Apartment 1	Apartment Building	2	60,000	$8,700,000	$502,148	$0	0.0577
Select	Marriott Tower	Hotel	4	75,000	$10,875,000	$11,723	$1,500	0.0010
Select	Administration	Office (Maximum 4 Floors)	1	15,000	$2,025,000	$470,343	$6,000	0.2322
Select	General Classroom 1	Classroom	3	12,000	$1,980,000	$811,921	$13,625	0.4100
Select	Classroom Building 2	Classroom	5	20,000	$3,240,000	$870,789	$4,850	0.2687
Select	Science Building	Classroom	6	12,000	$2,128,000	$186,471	$0	0.0876
Select	Annex Building	Daycare Center	7	2,500	$339,000	$0	$0	0.0000
Select	Aviation Maintenance	Classroom	8	3,000	$513,000	$0	$0	0.0000
Select	Air Hangar	Hanger, Aircraft	9	6,000	$510,000	$0	$0	0.0000

Edit | Add | Delete | Functions | Needs | Reports | Move Up | Move Down | Default Priority | Main Menu

Edit Building

Select the building (line will highlight in blue) you wish to edit and click the **Edit** button.



ADHE Facilities Audit Program

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Select	**Administration**	**Office (Maximum 4 Floors)**	**1**	**15,000**	**$2,025,000**	**$470,343**	**$6,000**	**0.2322**
Select	General Classroom 1	Classroom	3	12,000	$1,980,000	$811,921	$13,625	0.4100
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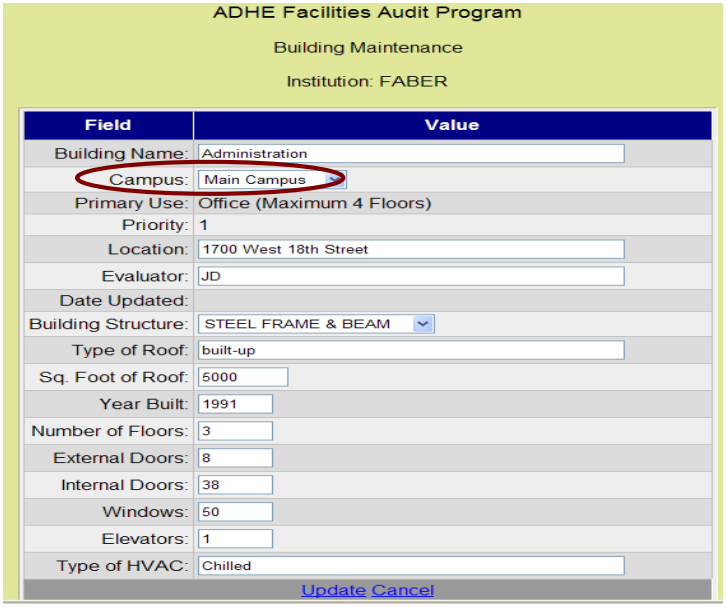
Select	Air Hangar	Hanger, Aircraft	9	6,000	$510,000	$0	$0	0.0000

Edit | Add | Delete | Functions | Needs | Reports | Move Up | Move Down | Default Priority | Main Menu

A form similar to previous versions of FAP will appear with the current building data for the selected building.

All fields are required before the building data will Update (enter a zero if a field does not apply to this building).

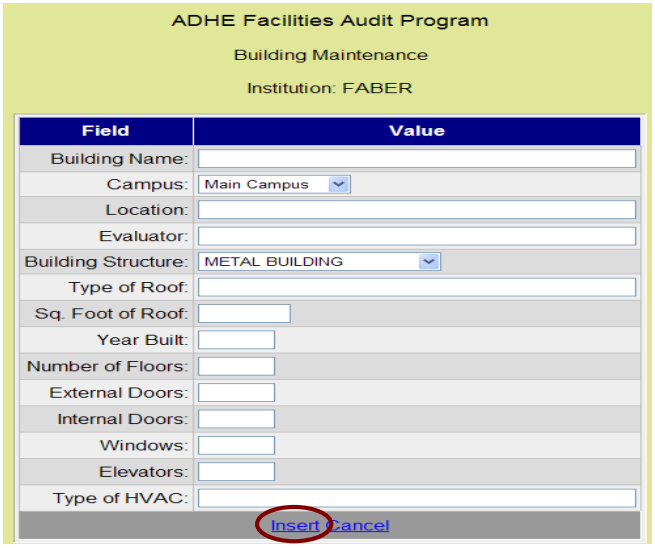
A change from previous versions of FAP is that to move a building from one campus to another, simply choose the campus on which the building is located from the drop-down menu in the Edit Building screen. The Date Updated field will be automatically completed when the Update button is clicked on the Edit Building screen. The Primary Use field may be edited on the Building Function screen.



After making revisions to the building data be sure to click **Update**.

Adding a New Building

To add a new building to the FAP database, click the **Add** button on the Building Maintenance screen. A blank form identical to the edit building form will appear, all fields are required before a new building can be added.



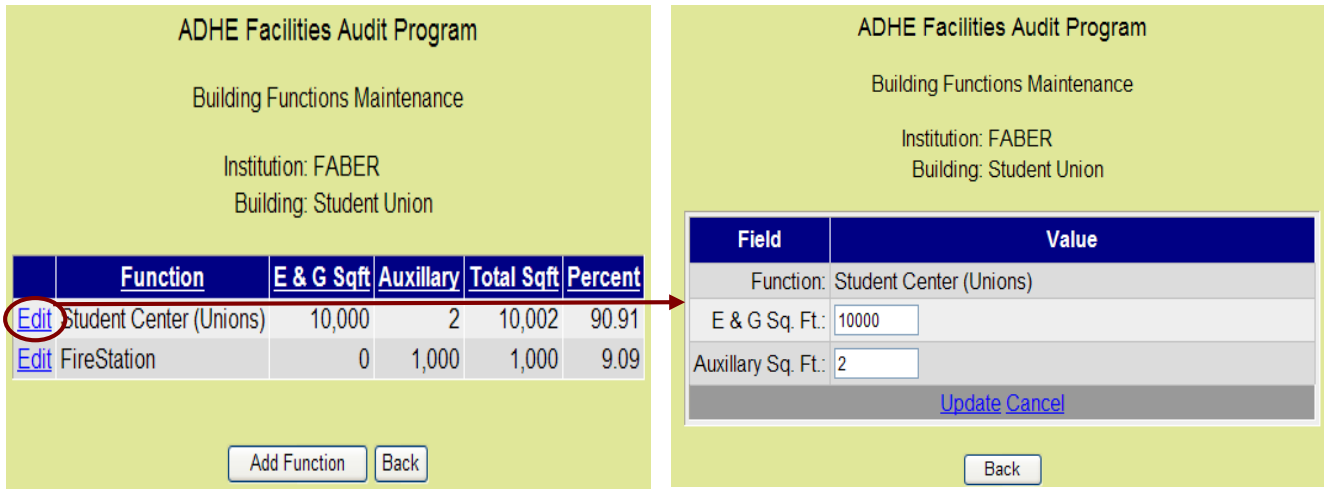
Click the **Insert** button when all fields are completed. The program will return to the Building Maintenance screen and the new building should appear. There may be more than one page of buildings, if so a row of page numbers will appear at the bottom of the building list on the Building Maintenance Screen.

Identify Building Function

The building function describes the uses of building space. Each building may have multiple functions. The building function is used in determining the Current Replacement Value and to determine the components available in the building maintenance needs screen. Available components are determined by the primary function of the building (the highest % of allocated square footage). The Current Replacement Value takes into account all functions of the building.

A function MUST be added to new buildings before maintenance needs can be entered.

From the Building Maintenance Screen, SELECT a building and click the **Functions** button. To Edit a current function click **Edit**.



The user will enter the total number of Educational & General (E&G) square feet and Auxiliary square feet devoted to each function. The total number of square feet for all functions should equal the number of square feet in the building.

To add a new function to a building, click the **Add Function** button. The user will be asked to choose a function from the drop-down menu and will again enter E&G and Auxiliary square footage dedicated to that function.

New features in Building Functions include the addition of five new functions Apartment Building, College Dorm (> 4 floors), Computer Center, Daycare, and Hotel. Maintenance needs associated with components will NOT have to be deleted and re-entered when the primary function is changed.

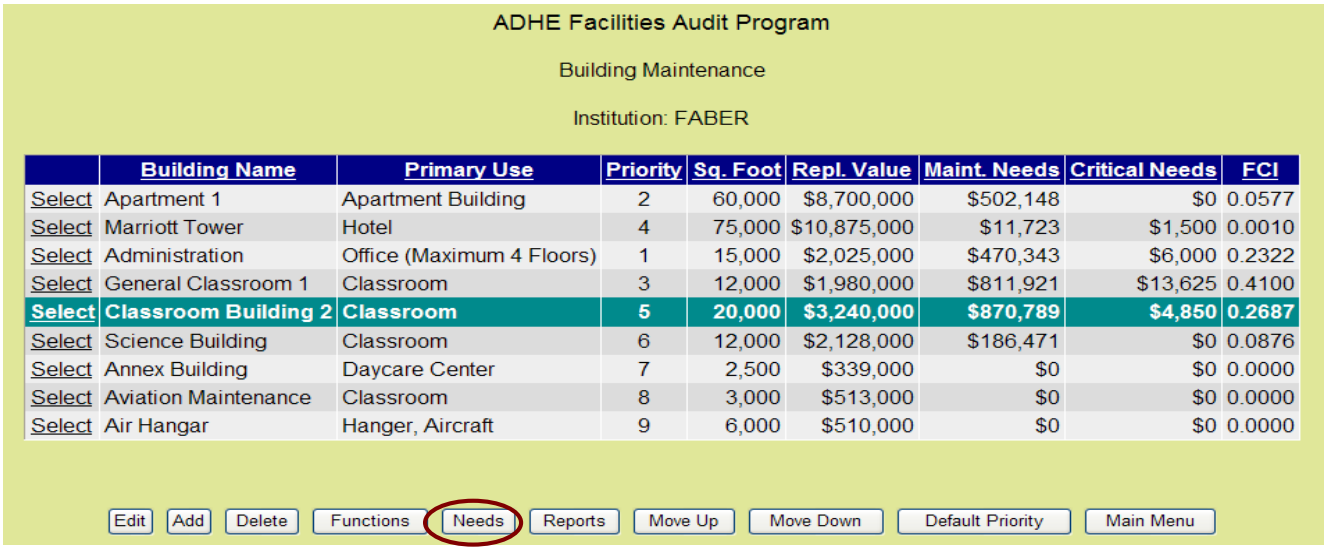
** Please check to be sure that the current building function matches the use of the building. The Building Function Allocation report is a good tool to use in verifying this information. Several buildings at institutions have been remodeled in recent years to serve a new purpose; however, the function of those buildings has not changed in the FAP database.*

Maintenance Needs & Critical Maintenance Needs

FAP estimates maintenance needs for all buildings in the same manner, using building systems' "expended useful life" and each system's proportion of the total current replacement value of the building. (See Example Calculations in Appendix A for a more detailed explanation.) Information relating to each building system must be input in order for FAP to complete this calculation.

In addition, after building inspections, information relating to critical maintenance needs may be input. FAP does NOT calculate *critical* maintenance needs. The building inspector must estimate the cost of critically needed repairs and enter that amount into FAP using one of the four methods described in Appendix A. Keep in mind the definition of critical needs located on page 4 of this manual.

From the Building Maintenance screen, SELECT a building and click the **Needs** button.



	Building Name	Primary Use	Priority	Sq. Foot	Repl. Value	Maint. Needs	Critical Needs	FCI
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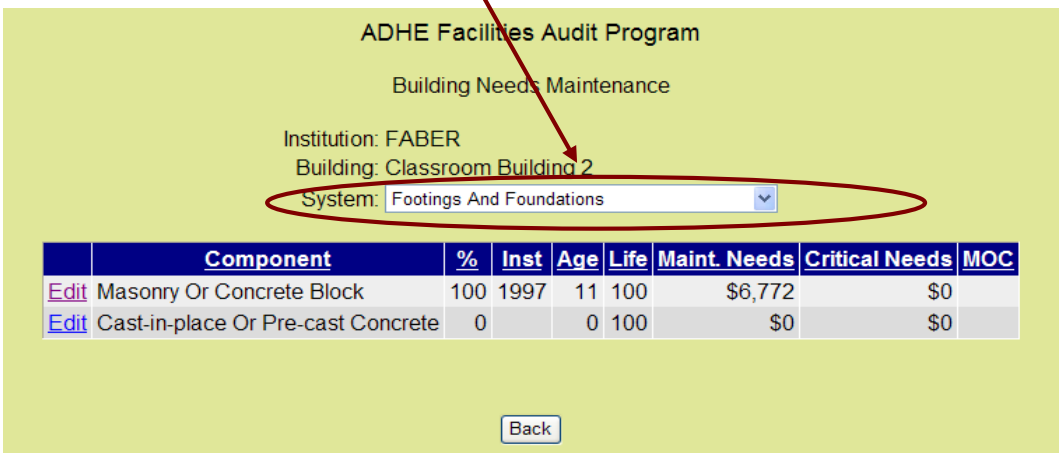
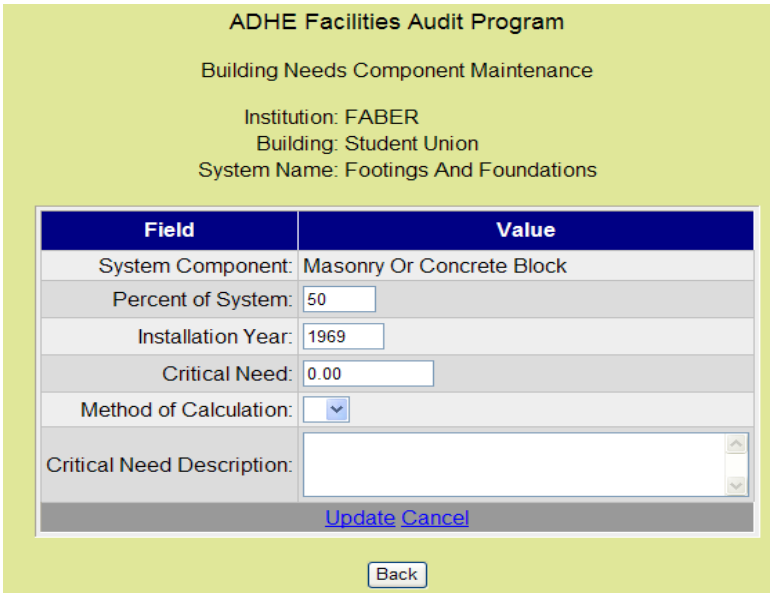
Select	Administration	Office (Maximum 4 Floors)	1	15,000	$2,025,000	$470,343	$6,000	0.2322
Select	General Classroom 1	Classroom	3	12,000	$1,980,000	$811,921	$13,625	0.4100
Select	**Classroom Building 2**	**Classroom**	**5**	**20,000**	**$3,240,000**	**$870,789**	**$4,850**	**0.2687**
Select	Science Building	Classroom	6	12,000	$2,128,000	$186,471	$0	0.0876
Select	Annex Building	Daycare Center	7	2,500	$339,000	$0	$0	0.0000
Select	Aviation Maintenance	Classroom	8	3,000	$513,000	$0	$0	0.0000
Select	Air Hangar	Hanger, Aircraft	9	6,000	$510,000	$0	$0	0.0000

The building systems available on the Building Needs screen are determined by the primary function of the building. Users will choose the building system from the drop-down menu and edit system components within each system.



	Component	%	Inst	Age	Life	Maint. Needs	Critical Needs	MOC
Edit	Masonry Or Concrete Block	100	1997	11	100	$6,772	$0	
Edit	Cast-in-place Or Pre-cast Concrete	0		0	100	$0	$0	

After selecting the building system from the drop-down, click **Edit** next to the component to edit component data.



Users must enter the percent of the system made up by the selected component, the year of installation, any critical needs (calculated using one of the four methods described in Appendix A), the method used to calculate the critical need, and a description of critical needs.

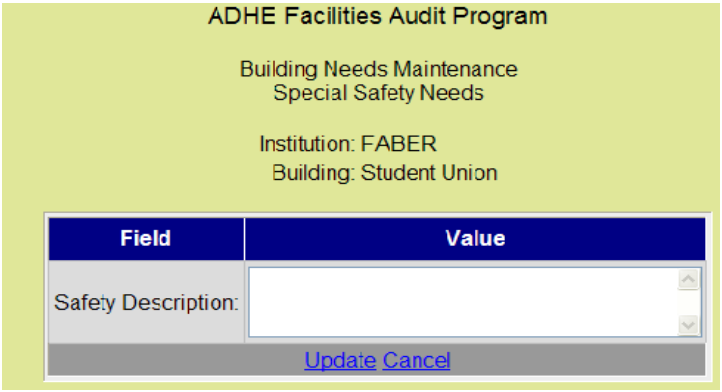
Once all data has been entered, clicking the **Update** button will return the user to the Building Needs screen where the next building system/component will be edited.

This process should be repeated until all systems and components have been entered.

Previously entered systems and components are currently displayed as submitted in the previous version of FAP, with the exception of ADA Compliance, Asbestos Abatement, and Critical Needs. These three fields have been zeroed out and will need to be re-entered with every new version of FAP.

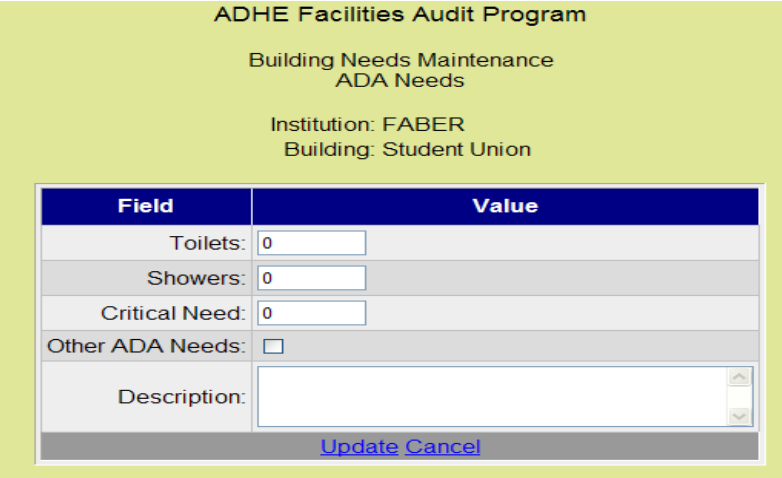
Three building systems require an additional entry form from the user, Special Safety Systems, ADA Compliance, and Asbestos Abatement.

Special Safety Systems require a description of the system. The user will be prompted to complete the form after clicking Update on the Edit Component Screen.

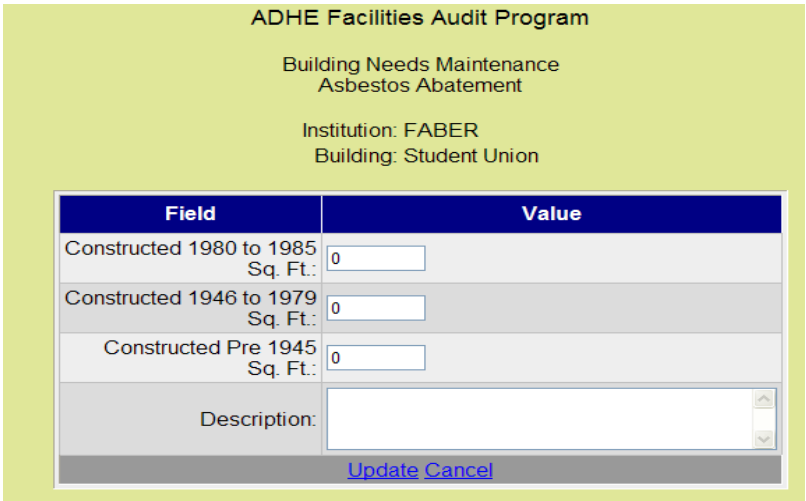


All ADA Compliance and Asbestos Abatement needs should be entered as critical needs using thecalculations and forms detailed below. FAP does not calculate maintenance needs for ADA Compliance or Asbestos Abatement.

ADA Compliance needs require the entry of the number of accessible toilets, showers, or other types of accessibility needs (please describe other needs). Appendix E contains the cost estimates for ADA compliance items for use in calculating the appropriate value to be entered for ADA compliance critical needs.



Asbestos Abatement needs require the user to enter the number of square feet requiring abatement by year of construction after clicking Update on the Edit Component screen.



Appendix F contains the Asbestos Abatement Pricing Guide used to calculate the critical needs for Asbestos Abatement.

The allocation of each component within a building system must total either 0% or 100%.

After entering all building system, component, and critical maintenance need data (be sure the Update button has been clicked for each building system), click the **Back** button to return to the Building Maintenance screen.

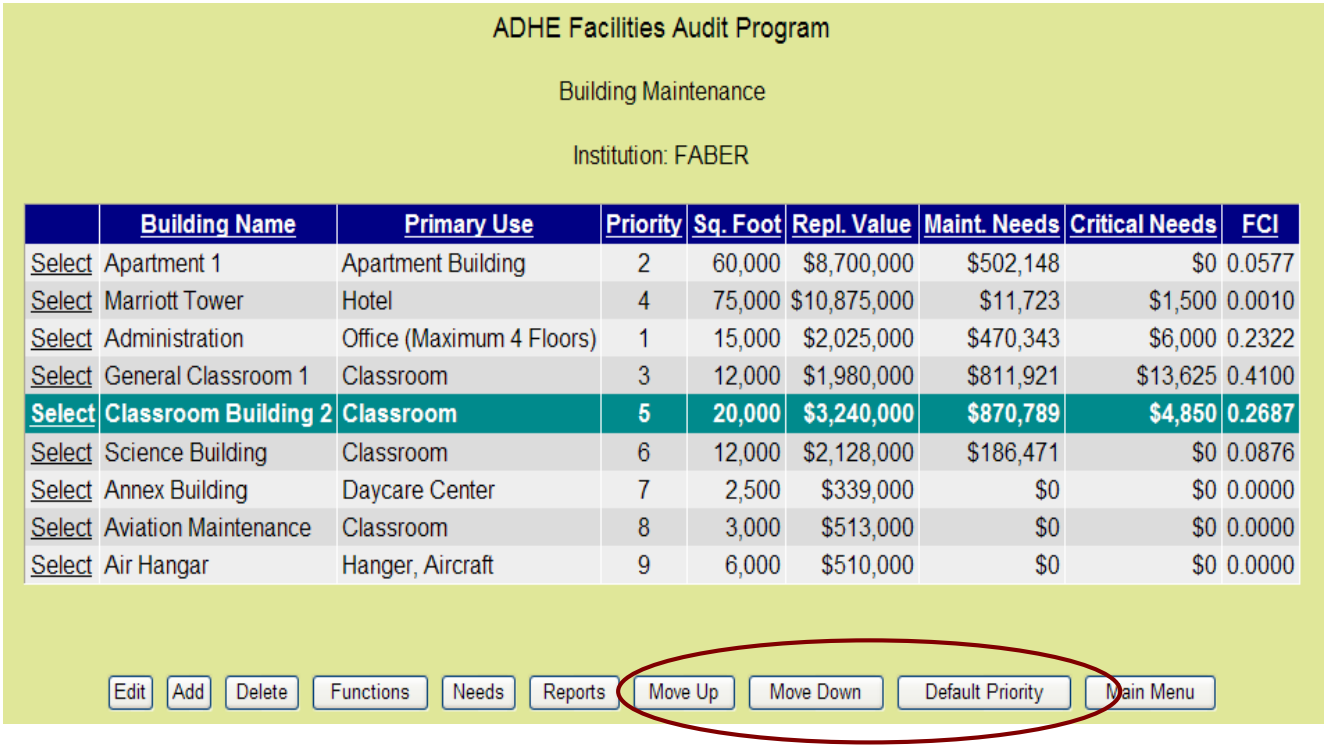
Delete Building

To delete a building, from the Building Maintenance screen SELECT the building you wish to delete and click the **Delete** button. The user will be directed to a form similar to the Edit Building form with a Delete button at the bottom. Click **Delete** on this form and the building will be deleted. Remember this is LIVE data, once the building has been deleted the only way to reverse the delete action is to enter the building by adding a building.

Set Building Priority

Once all building data has been entered, and maintenance and critical needs have been entered, return to the Building Maintenance screen to set priorities for critical maintenance projects. By default, projects will be prioritized in the order of the critical maintenance needs. That is, the building having the largest critical maintenance need will be ranked as first priority. However, institutions may prioritize projects as they desire.

To change the priority, on the Building Maintenance screen SELECT a building.



With the building selected use the **Move Up** and **Move Down** buttons to change the priority of the building. At any point clicking the **Default Priority** button will change the priority field back to the default value (in order of critical needs).

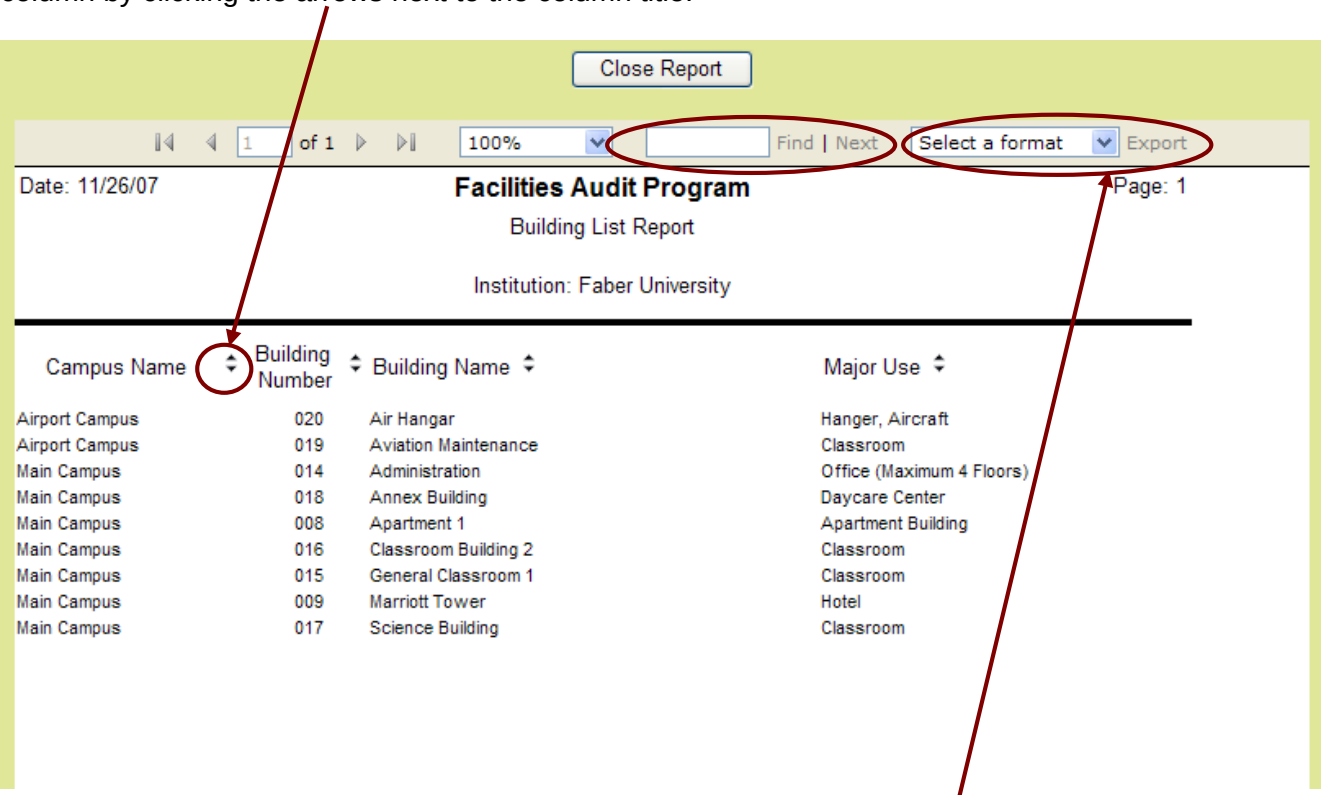
If a building has been deleted, the user will need to click the Default Priority button to remove the deleted buildings ranking from the list.

Once Building Priorities have been determined FAP data entry is complete, return to the Main Menu, open the **Maintenance Priorities Report**, **print** the report and mail a **signed** (President or Chancellor signature required) copy to ADHE.

FAP Reports

There are two ways to review FAP reports. From the **Main Menu** clicking the **title of the report** you wish to view will open the report. Depending on the report FAP will display results for all buildings in the FAP database for that institution. From the **Building Maintenance** screen, SELECT a building and click the **Reports** button. This allows the user to review reports for the selected building only.

This revision to FAP produces reports in Adobe PDF format. Most reports can be sorted by any column by clicking the arrows next to the column title.



All FAP reports may also be exported in either Adobe PDF or MS Excel format by choosing the preferred format from the drop-down box and clicking the **Export** button. Exporting allows users to save or print reports.

To **print** a report, follow the steps to **Export report to Adobe PDF**. The user will have the option to Open or Save the report. Choose **open** and the report will be displayed as a PDF file. Choose **File and Print** to print the report.

Users may also search reports for specific text by typing the text in the search box and clicking the **Find** button. Clicking the **Next** button will find the next match within the report.

Clicking the **Close Report** button will return the user to the Main Menu.

A description and example of each report can be found in Appendix G.

APPENDIX A

Methods of Calculation and Example Calculations

Methods of Calculation:
Building Descriptors and Maintenance Needs Costs

FAP performs all calculations necessary to estimate maintenance needs and to calculate the Current Replacement Value (CRV) and the Facility Condition Index (FCI). All critical maintenance needs, however, must be manually calculated and the results entered to the database.

Current Replacement Value

FAP calculates the Current Replacement Value (CRV) when building data, including items such as name, age, gross square footage, type of construction, and building function, have been entered. The CRV estimates new construction costs for a substantially similar, but modern building. The gross square footage by function is multiplied by the value per square foot assigned for that function as described in Appendix B. For instance if a building contains 5,000 square feet of classroom space, multiply 5,000 by $180 (the per square foot average cost of classroom space) for a CRV of $900,000. If 4,000 square feet in that building are devoted to classrooms and 1,000 are laboratory space, multiply 4,000 by $180 per square foot and multiply 1,000 square feet by $210. Sum the results of these two calculations to obtain the CRV of $930,000. The CRV is used in every estimate of the maintenance needs of a building system.

Maintenance Needs and Critical Maintenance Needs

Scheduled maintenance needs are calculated by Method 1, the expended useful life calculation (except for asbestos abatement and ADA accessibility modifications). If a maintenance need is considered to be critical according to the criteria defined on page 4, the evaluator may calculate the critical need cost *using any one or a combination of Methods 1 through 4* described below. The resulting estimate of the cost of the critical repair is then entered into FAP.

METHOD ONE: Expended Useful Life

After inspection, and using available records, determine the age of each system in the building and enter this value at the appropriate prompt. The computer will calculate the maintenance need by referencing Appendices C and D and applying the formula used in the following example:

Example: Calculate the cost of repair or replacement of the HVAC system in a classroom building

Where:

1) System Age equals ten (10) years (as determined by the inspection records).
2) System's Useful Life equals twenty (20) and thirty (30) years (from Table 3, Useful Life of Building Systems, Appendix D).
3) Component Multiplier (determined by the predominant building function) equals 0.0200 for thirty-year components and 0.1794 for twenty-year components (from Table 2, Percent Value of Building Systems, and Appendix C).
4) Current Replacement Value equals $900,000 (as calculated in the previous section).

System Age		Useful Life		Component Multiplier		Current Replacement Value		Maintenance Need for System
10	/	30	X	0.0200	X	$900,000	=	$5,940
10	/	20	X	0.1794	X	$900,000	=	$80,730
								$86,670

The HVAC maintenance cost equals $86,670.

METHOD TWO: Percent Deficiency

This is an optional method of manual calculation for use *when the maintenance need is critical* as defined on page 4, and the system's condition shows wear exceeding the value that would be assigned using Method 1, the expended useful life method. The evaluator must establish a percent of deficiency value for the affected system, using his or her own best judgment regarding how much of the system's useful life has been expended. Using this formula and Appendix C, the System Deficiency Cost may be calculated as follows:

Example: Calculate the maintenance need of the interior wall finishes in the classroom building.

Where:

1) System Deficiency Rating equals fifty-five percent (55%) of expected useful life as judged by the evaluator.
2) Component Multiplier (as determined by the predominant function of the building) for interior wall finishes for the predominant building function equals 0.0227 (from Table 2, Appendix C).
3) Building Current Replacement Value equals $900,000.

System Deficiency Rating		Component Multiplier		Current Replacement Value		Maintenance Need for System
0.55	X	0.0227	X	$900,000	=	$11,237

The interior wall finish maintenance cost equals $11,237.

METHOD THREE: Materials and Labor

This is an optional method of manual calculation for use *when the maintenance need is critical* and the cost of labor and materials can be established using the Means cost data such as *Means Repair and Remodeling Cost Data, Means Square Foot Cost, Means Facilities Cost Data*, and/or *Means Building Construction Cost Data*. This estimate is calculated as follows:

Example: Calculate the total cost for replacing lighting units.

Where:

1) The estimated labor cost for each fixture is $142.
2) The cost per fixture is $82.63.
3) 100 fixtures need replacing.

($142 + $82.63) X 100 fixtures = $22,463

The System Deficiency Cost is $22,463.

METHOD FOUR: Other Sources

This is an optional method of manual calculation for use *when the maintenance need is critical* and maintenance need costs are based on an authoritative source other than those listed in Method 3. Contractors, architects or engineers, published books accepted by the construction industry, or estimates provided by Arkansas State Building Services are generally acceptable. The estimate may be documented by this method and described as follows:

A contractor's estimate for exterior doors eight pairs (installed) -- totaled $15,312 and the System Deficiency Cost is $15,312.

Facility Condition Index

The Facility Condition Index (FCI) is automatically calculated after revised data has been entered for all building systems. The calculation divides the total maintenance need by the building's Current Replacement Value (CRV). The calculation is carried out to 5 decimal places and truncated at 4. (The value of critical maintenance needs is not included in this calculation.)

Facility Condition Index (FCI) =

$$\frac{\text{Total Maintenance Needs}}{\text{Building Current Replacement Value (CRV)}}$$

List of Tables

Appendices B through F contain copies of the look-up tables used by FAP to complete various calculations and Appendix G presents sample reports. Examples of the calculation of maintenance needs for various systems begin on the following page. The schedules used in the calculations are as follows:

Appendix B - Building Current Replacement Value:
Establishes a Current Replacement Value (CRV) for each building by building function(s). In multi-use buildings, cost per square foot is prorated by each function. For example, in a building containing classrooms and an auditorium, estimate the square footage of each usage and apply the appropriate per square foot value in Appendix B for each function to determine the total CRV for the building.

Appendix C - Available Component Multipliers by Building Type:
Establishes a percent value or Component Multiplier (C.M.) for each system of the building based on the predominant use of the building. Each building function has a unique schedule, and the component multipliers for each "predominant function" total 1.00 for all systems. For instance, if 75% of the building space is classrooms and 25% laboratories, the classroom function will determine the schedule of C.M.'s (Appendix C) used in the calculations. Note that each building system may be composed of several components.

Appendix D - Useful Life of Building Systems:
Establishes an anticipated useful life for each system in the building. If the system being evaluated does not fit the descriptions contained in this table, call SBS for advice.

Appendix E - Americans with Disabilities:
Provides estimates of the cost of various alterations required to meet the standards of the federal Americans with Disabilities Act.

Appendix F - Asbestos Abatement Pricing:
Provides cost estimates for asbestos abatement based on the year of the building's original construction.

Appendix G - Sample Reports:
Presents examples of completed FAP reports including 1, 2A, 2B, and 3, Building Needs Detail Report and Building Function Allocation Report.

Example Calculation

(FOR A STUDENT UNION)

To demonstrate how FAP calculates various values for buildings, the following evaluation of a Student Union is provided.

Example: Seventeen (17) year old building, 3 floors.

CRV = $210 x 33,000 square feet = $6,930,000

Note: When converting fractions to decimals, calculate to 5 places past the decimal and truncate at 4. Do not round. Round dollar amounts to the nearest whole dollar.

Building Systems and Components				Age		Useful Life			CM		CRV		Maint Needs
1110 Footings And Foundations													
001 Masonry Or Concrete Block	50%	X	(	17	/	100	)	X	0.0313	X	$6,930,000	=	$18,437
002 Cast-in-place Or Pre-cast Concrete	50%	X	(	17	/	100	)	X	0.0313	X	$6,930,000	=	$18,437
1120 Excavation And Backfill													
001 Excavation And Backfill	100%	X	(	17	/	100	)	X	0.0064	X	$6,930,000	=	$7,540
1220 Exterior Closure Walls													
012 Hollow Or Concrete Block; Brick Masonry	100%	X	(	17	/	50	)	X	0.0886	X	$6,930,000	=	$208,759
1280 Columns And Beams													
001 Columns And Beams	100%	X	(	17	/	100	)	X	0.0384	X	$6,930,000	=	$45,239
1310 Slab On Grade													
001 Reinforced Concrete Floor Slabs	100%	X	(	17	/	100	)	X	0.0213	X	$6,930,000	=	$25,094
1320 Elevated Floors													
002 Elevated Floors	100%	X	(	17	/	75	)	X	0.0687	X	$6,930,000	=	$107,914
1330 Floor Finishes													
001 Carpeting	10%	X	(	6	/	12	)	X	0.0534	X	$6,930,000	=	$18,503
002 Resilient Vinyl Tile	90%	X	(	17	/	20	)	X	0.0534	X	$6,930,000	=	$283,097
1410 Roof Construction													
002 Corrugated Metal Deck	100%	X	(	17	/	30	)	X	0.0636	X	$6,930,000	=	$249,757
1430 Roof Covering													
001 Roll Roofing / Single Ply	100%	X	(	12	/	12	)	X	0.0148	X	$6,930,000	=	$102,564
1440 Roof Insulation													
001 Expanded Perlite,polyurethane & Fiber Bd	100%	X	(	17	/	40	)	X	0.0078	X	$6,930,000	=	$22,976
2110 Ceiling Finishes													
001 Acoustical Tile	25%	X	(	17	/	20	)	X	0.0282	X	$6,930,000	=	$41,528
002 Plaster	75%	X	(	17	/	40	)	X	0.0282	X	$6,930,000	=	$62,292
2210 Interior Surface / Exterior Wall													
005 Brick	100%	X	(	17	/	75	)	X	0.0079	X	$6,930,000	=	$12,409
2240 Wall Finishing													
001 Interior Paint-on Masonry (high Use)	100%	X	(	1	/	2	)	X	0.0201	X	$6,930,000	=	$69,647
2310 Windows And Glaze Walls													
001 Operable Glazing;fixed,single,double	100%	X	(	17	/	40	)	X	0.0373	X	$6,930,000	=	$109,858

2320	**Exterior Closure Doors**													
	001 Automatic Sliding Door	10%	X	(	9	/	15	)	X	0.0048	X	$6,930,000	=	$1,996
	004 Hollow Metal Door Frame; solid Core Wood	90%	X	(	17	/	40	)	X	0.0048	X	$6,930,000	=	$12,723
2330	**Interior Doors**													
	001 Hollow Core Wood	100%	X	(	17	/	20	)	X	0.0537	X	$6,930,000	=	$316,320
3110	**HVAC System (20 Year Life Components)**													
	001 Twenty (20) Year Life Components	100%	X	(	17	/	20	)	X	0.0461	X	$6,930,000	=	$271,552
3220	**Plumbing System (20 Year Life Component)**													
	001 Twenty (20) Year Life Components	100%	X	(	17	/	20	)	X	0.006	X	$6,930,000	=	$35,343
3315	**Electrical/lighting (40 Year Life Comp.)**													
	001 Forty (40) Year Life Components	100%	X	(	17	/	40	)	X	0.1015	X	$6,930,000	=	$298,943
3410	**Conveying**													
	001 Elevators	100%	X	(	17	/	50	)	X	0.0285	X	$6,930,000	=	$67,152
4110	**Stairs**													
	002 Pre-cast Concrete Stairs	100%	X	(	17	/	50	)	X	0.0102	X	$6,930,000	=	$24,033
4210	**Fire Protection**													
	001 Fire Protection(sprinklers & Standpipes)	100%	X	(	17	/	40	)	X	0.0208	X	$6,930,000	=	$61,261
4410	**Special Safety**													
	001 Special Electrical System	100%	X	(	8	/	20	)	X	0.0165	X	$6,930,000	=	$45,738
												TOTAL MAINTENANCE NEEDS:		**2,539,110**

APPENDIX B

CURRENT REPLACEMENT VALUE

Although the building CRV may be available elsewhere, FAP's CRV is the only value recognized by ADHE for budget purposes. ADHE has used RSMeans Square Foot Cost Data as a source in establishing the per-square-foot value used to calculate the Current Replacement Value. This value has been fixed for several types of buildings typically found on Arkansas college and university campuses.

In multi-use buildings, the CRV should be prorated across the various functions. For instance, if 4,000 square feet of the building are allocated to classrooms and 1,000 square feet to laboratories, multiply 4,000 * $180 (the value per square foot assigned to classroom space) and multiply 1,000 * $210 (the value per square foot assigned to laboratory space). The sum of these two calculations equals the building's CRV.

This CRV information has been developed solely for this report. These replacement values are not intended to be applied to construction budgeting efforts or for other facility programs.

Current Replacement Values

Function Code	Function Description	Square Foot Value
0000	unused function	$0
2010	Apartment Building	$163
2040	Auditorium	$224
2120	Classroom	$192
2130	College Dorm (1-4 Floors)	$177
2140	College Dorm (4+ Floors)	$174
2150	Laboratory	$224
2155	Graduate Research Center	$258
2160	Student Center (Unions)	$224
2170	Community Center	$152
2175	Computer Data Center	$231
2195	Daycare Center	$146
2200	Factory	$120
2220	Fire Station	$152
2270	Garage (Parking)	$49
2290	Garage (Repair)	$113
2310	Gymnasium	$192
2320	HPER	$208
2321	Hanger, Aircraft	$96
2330	Hospital / Serv. Ctrs. 4 Floors or Less	$258
2340	Hospital / Serv. Ctrs. Greater Than 4 Floors	$224
2350	Hotel	$156
2390	Library	$208
2400	Medical Office / Infirmary	$177
2450	Nursing Home	$160
2460	Office (Maximum 4 Floors)	$152
2470	Office (Over 4 Floors)	$177
2510	Racquetball Court	$135
2590	Vocational School	$152
2650	Swimming Pool Building	$160
2690	Warehouse	$72
2700	Miscellaneous Storage Bldgs	$80
2701	Physical Plant Facilities	$135
2750	Power Plants	$1030
2801	Greenhouse (Contract)	$136
2802	Economy Building	$88
2803	Greenhouse (In-house)	$80
2901	Residence Type 1	$192
2902	Post Office	$160
2903	Residence Type 2	$160
2904	Residence Type 3	$120
2905	Residence Type 4	$96
2906	Residence Type 5	$64
3000	Barn w/4 Walls Type 1	$57
3001	Barn w/4 Walls Type 2	$48
3002	Barn w/4 Walls Type 3	$32
3003	Barn w/4 Walls Type 4	$23
3010	Barn w/Less Than 4 Walls Type 1	$26
3011	Barn w/Less Than 4 Walls Type 2	$21
3012	Barn w/Less Than 4 Walls Type 3	$16
3013	Barn w/Less Than 4 Walls Type 4	$12
3020	Stanchion Dairy Barn	$169
3030	Barn, Classrooms / Spec. Purpose	$120
3040	Poultry House	$72

APPENDIX C

AVAILABLE COMPONENT MULTIPLIERS (CM) BY BUILDING TYPE (PERCENT VALUE OF BUILDING SYSTEMS)

The following table, Available Components by Building Type (Percent Value of Building Systems), was established by Arkansas State Building Services (SBS). The Percent Value is used as the Component Multiplier (CM) in calculating the dollar value of maintenance needs of a system. Each type of building has a unique set of values. In multi-use buildings, the predominant use of the building determines the function chosen for this calculation. For instance, calculations for a building that is 75% classroom space and 25% laboratory space will reference the CM table for the classroom function. Unless otherwise noted percent values of these schedules were derived by using Means Square Foot Cost, updated in 1998.

METHOD OF ESTIMATING THE
COST/PERCENT VALUE OF BUILDING SYSTEMS:

1. Define the type of building by predominant function (i.e., classrooms, office, laboratory, etc.).

2. Determine the percent value for each system in the building.

The building Cost Per Square Foot column in Means data book is used to establish the square foot cost/percent value for each system in the building. The square foot value for all of the building systems is calculated from this column. The sum of the building systems CM's must equal 1.00.

If your building type is different from the types listed in this report. Call ADHE staff for advice.

APPENDIX D

USEFUL LIFE OF BUILDING SYSTEMS

This schedule is used to estimate the useful life of a building system. Each building system has a different useful life, and system components within a system may also have different useful lives.

The following table of Useful Life of Building Systems was established by Arkansas State Building Services.

APPENDIX E

AMERICANS WITH DISABILITIES ACT (ADA) PRICING

The ADA Pricing Schedule provides the approximate cost of items commonly necessary to complete modifications to meet the requirements of the federal Americans with Disabilities Act (ADA).

SBS developed this table for use when more precise information is not available.

Pricing Schedule

Item	Amount
New unisex ADA toilet with one lavatory and one water closet in existing building	$7,500/each
Elevator improvements (excluding cab replacement)	$2,500/cab
Other miscellaneous items (door, clearance improvements, door thresholds, existing toilet room renovations)	$0.50/SQFT of bldg.

NOTES:
1) In the absence of more reliable cost data for a specific building, use these data in the completion of Form #2 (Building Condition Evaluation Form)

APPENDIX F

TABLE 5
ASBESTOS ABATEMENT PRICING

Provided below is the approximate cost per square foot for asbestos abatement in buildings according to their original construction dates.

SBS has developed these values for use when more accurate pricing data is unavailable. If consultants have completed an asbestos abatement survey on the campus, include their estimate of cost and note the source of information in the text space provided in the FAP program for this building component.

Year Constructed	$ per Gross Bldg SQFT
1980 to 1985	$2.00
1946 to 1979	$5.00
1945 and before	$1.00

Sample Asbestos Cost Deficiency Calculation:

Total Building Gross SQFT Floor Area: 20,000
1955 portion: 15,000
1982 portion: 5,000

1955) 15,000 SQFT x $5.00/ SQFT = $75,000
1982) 5,000 SQFT x $2.00/ SQFT = $10,000

Asbestos Cost Deficiency $85,000

APPENDIX G

FAP REPORTS

The remainder of this manual contains examples of each report available in FAP. Instructions for accessing, exporting, and printing these reports are included on page 16 of this manual.

A copy of the Maintenance Priorities report is to be printed and signed by the President or Chancellor of the institution when FAP data entry has been completed. The signed report should be mailed to ADHE as described on page 1 of this manual.

Available reports include:

- Building List
- Maintenance Priorities
- Building Condition Evaluation
- Building Needs Survey
- Building and Land Summary
- Building Needs Detail
- Building Function Allocation