STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT

COLORADO

FACILITY CONDITION AUDIT AND INFRASTRUCTURE ASSESSMENT INSTRUCTIONS

BASED ON THE 2001
FACILITIES CONDITIONS AUDIT PROGRAM OF THE
DEPARTMENT OF FACILITIES MANAGEMENT
COLORADO STATE UNIVERSITY

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Infrastructure Assessment forms are not included with these instructions.

1. BENEFITS OF FACILITY CONDITION AUDIT AND INFRASTRUCTURE ASSESSMENT

The objective of evaluating owned Real Property and Fixed Equipment is to perform facility condition audits of buildings and infrastructure assessments of land improvements. The information collected is used to update the list of routine maintenance projects, modify the CC/CR and CM 5 year plans, update the building inventory information, and create a report of all the findings and conclusions. The information collected is also important in justifying the documents an agency or institution submits to OSA as part of their annual budget requests for CC/CR/CM construction projects. The audit and assessment are also used to support operation and maintenance budgets requests. The benefit of the evaluation is to create or update a comprehensive document which identifies and quantifies building systems/components and the associated costs to renovate, retrofit, restore, and maintain “existing buildings” to a “like new” condition. The facility condition audit will serve to acquaint management and maintenance personnel where deficiencies exist, the overall condition of their buildings, generate the Facility Condition Index (FCI) value, and provide information that will assist in long range planning and budgeting activities. In addition to the facility condition audit, an assessment of the state agency’s/institution’s infrastructure will identify where deficiencies exist based on age, the frequency and type of work orders, or where the infrastructure has reached or exceeded design capacity. The infrastructure assessment results in creating order of magnitude cost estimates to repair or replace infrastructure deficiencies.

The buildings should be audited on a cycle of every three to five years. The cycle is determined on the importance of the building to meet program needs, hours of building use, and perceived maintenance requirements of a building. Small, non-critical buildings should be on the building inventory list, but may never require an audit because their needs meet the routine maintenance criteria. Infrastructure should be assessed as necessary, but within a ten-year cycle.

The infrastructure assessment is different from a building audit because only parts of the improvements may be visibly inspected. In particular, most of the below ground infrastructure is evaluated based on age, known maintenance problems, load capacity, and not from a visible inspection. Thus, an agency or institution may not have in-house expertise but need the support of a professional consultant to complete the assessment.

Information Technology (IT) services and the equipment and systems supporting IT services are not part of the building audit.

2. DEFINITIONS

"Fixed equipment" includes, but is not limited to, mechanical, electrical, or plumbing components built into Real Property that are necessary for the operation of the Real Property. 24-30-1301 (9), C.R.S

"Real property" means a facility, state-owned grounds around a facility, a campus of more than one facility and the grounds around such facilities, state-owned fixtures and improvements on land… 24-30-1301 (15) (a), C.R.S

Routine Maintenance, also known as preventive, preventative or cyclical maintenance, is an essential part of the on-going care and upkeep of any Real Property to delay or prevent the failure of critical and non-critical building systems and equipment. These deficiencies don’t meet the

criteria for controlled maintenance, capital renewal, or capital construction projects. These deficiencies are corrected with agency or institution internal operation and maintenance budgets.

Capital Improvements is repairs, replacements, upgrades, and other construction work through controlled maintenance, capital renewal, or capital renovations projects to existing buildings and infrastructure.

3. AUDIT AND ASSESSMENT BENEFITS

The information gathered in the facility condition audits of buildings and infrastructure assessments can provide management and maintenance staff useful data that will:

- Identify building, equipment, and infrastructure deficiencies.
- Create an organized flow of essential maintenance and repair work for the maintenance staff and facilities management.
- Present a report to assist administrators, facility managers with their long-range planning and budgeting needs.
- Provide facilities management with data that will aid in prioritizing state agency/institution capital construction, capital renewal and controlled maintenance projects.
- Substantiate the total long-term lifecycle projected capital improvements needs.
- Enhance personnel safety by identifying potential hazards.
- Appraise the effectiveness of any preventive and corrective maintenance programs currently in place at the institution.
- Reduce the overall costs of maintenance by initiating early corrective actions in lieu of reacting to later breakdowns.
- Reduce the frequency of trouble calls through proactive maintenance so that fewer resources are expended on crises, thereby enabling the preventive maintenance program to become more effective.
- Enhance maintenance staff productivity by correlating priority tasks with workforce labor availability and scheduled material procurements.
- Increase the reliability and obtain the full economical life of equipment through proper maintenance, thereby decreasing the need for additional capital investment.
- Reduce the number of equipment failures, thereby preventing interference with essential operation, reducing the dangers to life and property, and avoiding the high cost or long lead times for replacement of critical support equipment.

4. ORGANIZATION

The process to achieve successful building condition audits of buildings and infrastructure assessments starts with the following items:

- Selection of project coordinator and audit team members (field inspectors).
- Identifying all the buildings and types of infrastructure.
- Creating a list of buildings and infrastructure areas that require review.
- Collection of historical building and infrastructure information.
- Calculating the building system multipliers.
- Developing/Modifying and then train on the use of the audit forms.
- Inspecting buildings by systems/components on the basis of a physical analysis.
- Weighing the different systems/components of the analysis to produce an assessment.
- Providing data that can be used to justify and set priorities.
- Time frame (number of buildings per cycle) for completion of the project based upon the:

    - Number of building (g.s.f.),
    - Amount of infrastructure,
    - Maintenance/management personnel available,
    - Conducted by in-house personnel, professional firm, or a combination of both,
    - Expected time between inspections.
- Identifying the type of reports to be generated.

Historical records must be reviewed to collect historical data on each building. The prints and drawings will provide the basic knowledge of the different systems/components and should be referred to prior to conducting the actual field audit. Building information like gross square feet, building construction dates, and other historical data will need to be gathered and furnished to the audit team.

Site plans identifying the location of underground utilities and the transfer of ownership from the utility company should be collected or created. The transfer of ownership for utilities varies from next to the building, the meter, or the property line. Site plans locating all sidewalks, walkways, and roads need to be available. Include a listing of any security, historical, land use easements, or other constraints on a building or a site.

Establishing a time frame for completion of the field inspections (facility condition audits) is based upon an original estimate of staff-hours and adjusted after performing test audits on a few buildings. It is extremely important, however, to allow adequate time for a thorough inspection by the team members. The time to finish the audit and report is calculated based on the field inspection and then doubled as a rule of thumb is that is takes as long to analyze the information and write the report as it takes to conduct the audit.

5. EVALUATION RESULTS/REPORT

The audits and assessments are designed to provide reasonably accurate results, however there are some qualifications that must be interpreted to avoid unreasonable expectations.

- Deficiencies must be rated as accurately as possible. Because there are different levels of technical abilities among evaluators, there will be some variation in the results from different evaluations. The deficiency percentage is subjective based upon the evaluator's best judgment.
- The cost of each building system/component is also subjective. It is based on a percentage of the total value of the building. These percentages are called *building system multipliers* and vary according to building type.
- Design fees are not included in the review/report process. The design fees are determined when a renovation project is developed. The renovation project scope includes the identified deficiencies.

The information from the audits and assessments should be included in an agency's or institution's long-term facility planning. The results of the evaluations should never be considered a substitute for an architectural/engineering analysis or a professional cost estimate to implement the actual capital improvement work. The report should include all the information collected in Sections 7(d) and 7(e). The report should also include the two deficiency lists (routine maintenance deficiencies and CC/CR/CM type criteria deficiencies) as described in Section 8. The report should include the building systems/conditions audit summary form for each building. The individual building condition audit forms for each system for each building should be included

in the report, but depending on the number of owned buildings, either included with the report, or as part of an electronically available appendix file. A site map of the campus(s) indicating buildings is very helpful if the agency/institution has numerous buildings or sites.

6. INFRASTRUCTURE ASSESSMENT

Infrastructure assessment is both a review of above ground and below ground improvements. The infrastructure systems can be classified as below ground (gas, water lines, sewage, etc) or above ground (sidewalks, roads, etc). Some items might be a mix of above and below ground (area lighting, irrigation, electrical, etc) and at the assessment stage it is important to list the items regardless of its classification. For both a campus/complex or a detached structure, the process should include either creating or finding site plans that identify and list the location and ownership of all utilities and meters. Generally everything beyond five feet of the building footprint is considered infrastructure. It is important to identify the transfer of ownership and thus the maintenance responsibilities from the utility company or city to the state agency or institution. The transfer of maintenance responsibilities for infrastructure varies from the building footprint, at the meter, or the property line. The site plans should indicate all sidewalks, tunnels, and roads. Additionally, include a list of all security, historical, land use easements, or other constraints on the site plans. The assessment of above ground improvements may be visibly inspected. The assessment of below ground improvements because they are not always visible, is evaluated based on age, known maintenance problems, and load capacity. An agency or institution may not have the in-house expertise for the assessment, thus need the support of a professional consultant to complete the assessment. The assessment report should include a list of deficiencies, a review of code compliance issues, and a general cost estimate (not a detailed project request estimate) to repair/replace the system, by infrastructure system. The report should include a ranking of the infrastructure system deficiencies.

7. FACILITY CONDITION AUDIT

A. TEAM QUALIFICATIONS

The project coordinator is responsible for the facility condition audits and the infrastructure assessments. The facilities director is responsible to utilize the information from the audits and assessments to:

- present a report to assist administrators, executive directors, facility managers with their long-range planning and budgeting needs,
- help prioritizing state agency/institution capital construction, capital renewal and controlled maintenance projects,
- and quantify the long-term lifecycle projected capital improvements needs.

The project coordinator is important as they must share the state agency's or institution's desire to have a system of records that will accurately reflect the condition of owned and maintained buildings and infrastructure. An outside consultant could be hired for the audit set-up and facility conditions audits.

The audit team (field inspectors), should include representatives from the various trade shops because of their knowledge and experience with the condition of the buildings, building systems, and system components. Team members selected need to be thoroughly trained in the methodology to be used in the audits. The size of the team may vary from time to time based on the number of buildings and their unique building systems. If a consultant is hired to perform the

audit work, they need to include discussion with representatives from the trade shops because of their knowledge and experience with the condition of the buildings, building systems, and system components. The team should include but not limited to the following trades:

Structural Trades
Foundations/Structures
Building Envelope
Roof/Floors/Ceilings Systems
Walls/Windows Systems
Interior Finishes
Doors/Frames/Hardware
Locksets/Hardware

Vertical Conveyances Trades
Elevators
Escalators
Lifts

Painter Trades
Signage
Interior Paint
Exterior Paint

Plumbing Trades
Piping
Domestic Water
Backflow Prevention
Distilled Water
Steam
Chilled Water
Chemical - i.e. (Nitrogen & Oxygen)
Plumbing Fixtures
Natural Gas

Mechanical Trades
Air Handling Units/Exhaust Systems
Heating Systems and Components
Cooling Systems and Components
Controls
Energy Management Systems
Fume Hoods

Electrical Trades
Electrical Distribution/Associated Equipment
Electric Panel – Main / Secondary
Transformers/Switchgears
Emergency/Back-up Power
Electrical Devices
Lighting
Emergency Lighting
Exit Lighting

Safety Standards
Fire Detection Systems
Fire Suppression Systems
Accessibility
Health and Life Safety
Means of Egress
Security System

B. BUILDING INSPECTOR AUDIT CHECKLIST (suggested)

Facility Management Name Tag
Cell Phone
Master Keys /Swipe Cards
Flashlight
Clipboard
System Worksheets
Small Scale Floor/Roof Plans
Electrical One-Line Diagrams
Asbestos Abatement Report

C. INSPECTION TIME TABLE (estimates)

Description	Unit of Measure	Structural	Electrical	Mechanical	Total
Classroom Facilities	10,000 g.s.f.	1.5	1.0	1.3	3.8
Laboratory Facilities	10,000 g.s.f.	2.4	1.9	2.1	6.4
Office Facilities	10,000 g.s.f.	1.8	1.4	1.4	4.6
Supporting Facilities	10,000 g.s.f.	2.4	1.9	2.1	6.4

Health-Care Facilities	10,000 g.s.f.	2.3	1.5	2.0	5.8
Residential Facilities	10,000 g.s.f.	1.8	1.4	1.4	4.6
Buildings – Roofs	10,000 g.s.f.	1.2	--	--	
Roads & Streets	1,000 s.y.	0.1	--	--	
Sidewalks & Other Pavements	1,000 s.y.	0.1	--	--	
Grounds					
Improved	Acre	0.5	--	--	
Semi-Improved	Acre	0.4	--	--	
Unimproved	Acre	0.3	--	--	

* Minimum Inspection Time
Structural/Roof -- 1 hour, Electrical -- 0.5 hours, Mechanical -- 0.5 hours

D. LIST OF ALL REAL PROPERTY

The initial step is to create a list of all owned buildings and to determine if they are part of a campus/complex of buildings or a detached structure. The location of a building will help determine what buildings can be inspected as a group. The location of infrastructure on a campus/complex is important to determine where the building inspection ends and the infrastructure assessment starts. Generally, everything within five feet of the building footprint is considered as part of a building.

E. INFORMATION COLLECTED

The audit process requires collecting information on the buildings prior to the field inspections.

- Building Name and location (address, city, part of a campus/complex).
- Utilization of Space (occupancy type).
- Indicate the occupancy usage of the buildings: standard (40-60 hours a week), heavy (60 or more hours a week), 24/7, occasional (special events), infrequently.
- Building Number (Risk Management assigned number and state agency assigned number or for self-insured schools, their unique building identification number).
- Date of original construction and date of major remodeling/renovations.
- Number of floor above ground and below grade.
- Gross Square Footage.
- Measurement for infrastructure utilizing an appropriate method (length, area, volume).
- Description of building characteristics. Building information can usually be obtained from as-built drawings or other such documents.
- Current Replacement Value (Use the insured dollar amount as calculated by DPA-Division of Risk Management or an institution's risk management office). The insured value should be updated annually. Insured values, although conservative, are justifiable and reasonable as "order of magnitudes" for the facility condition audit work.
- Contact the local utility companies to determine location of all buried infrastructure, ownership, known problems, and other pertinent information.
- Maintenance history of building and infrastructure equipment/system.

F. BUILDING SYSTEM USEFUL LIFE

A building's useful life is limited by the durability of its systems (a building does not fail as a whole but by systems/components). A building's production life is limited by its continuing ability to meet the needs of the state agency or institution, which change over time.

The instructions recognize the systems as follows:

Systems	Average Useful Life
Foundations and Structure	75
Roofing	20
Exterior Cladding	50
Interior Partitions	20
Interior Finishes	10
Elevators	30
Plumbing	25
HVAC - Moving	20
HVAC - Static	30
Electrical - Moving	20
Electrical - Static	30
Fire Protection	30
Special Equipment	15

Additional systems can be added by the state agency/institution to fit their building types as necessary. The characteristics of facilities systems collectively constitute the building and each system has a definable useful life.

G. BUILDINGS SYSTEM MULTIPLIER VALUES

The building system multiplier values are critical to the accuracy of the report as it represents the percentage of value that each system has to the total value of the building. While critical, a few percentages points one way or the other will not affect the creation of the two deficiency lists (Section 17). The building needs evaluated based upon what actually exists, program needs, and proposed additions. The multiplier value is used in the mathematical formula that calculates the system deficiency rating and a dollar value for deficiency costs. There is no unique source for the multipliers that encompasses all building types' construction methods or locations.

Some sources for this information may be the facilities department, past construction records, and local construction contractors or architectural firms. Square Foot Costs sources can provide templates and cost data.

The square foot cost can be derived from:

- Means Repair and Remodeling Cost Data
- Contractor's Estimates
- Previous construction projects
- Building Repair Records

The following example shows how to derive building system multipliers. The building value in 2000 was $9,014,969 and the gross square feet is 108,930, thus the building has a value of

$82.76 per square foot for the example and does not include design fees (they are added at the project development stage). While this may be low, the system/component square foot costs are proportional to the total, and that is all that is important in the example. The total square fool cost of each component value divided by $82.76 will give the percentage to be used as the system multiplier. (Review Building System Multiplier Template "*SysCompMulti 2018.xlsx*").

BUILDING SYSTEMS	COMPONENTS of SYSTEM	COMPONENT VALUE ($/g.s.f.)	SYSTEM MULTIPLIER (number or %)
Foundation	Footing and Foundations	$ 1.40	
	Excavation and Backfill	0.51	
	Total this system	$ 1.91	
		$ 1.91 / $ 82.76	**0.023 (2.3%)**
Column and Exterior Walls	Structural Walls	$ 1.87	
	Exterior Wall	2.11	
	Total this system	$ 3.98	
		$ 3.98 / $ 82.76	**0.048 (4.8%)**
Floor	Elevated Floors	$ 5.03	
	Floor Finishes	3.53	
	Slab on Grade	1.66	
	Stairs	1.20	
	Total this system	$ 11.42	
		$ 11.42 / $ 82.76	**0.138 (13.8%)**
Roof	Superstructure	$ 2.77	
	Covering	1.09	
	Insulation	0.66	
	Openings and Specialties	0.08	
	Total this system	$ 4.60	
		$ 4.60 / $ 82.76	**0.056 (5.6%)**
Ceiling	Ceiling Finishes	$ 3.62	
		$ 3.62 / $ 82.76	**0.044 (4.4%)**
Interior Walls and Partitions	Partitions	$ 2.95	
	Wall Finished	2.28	
	Interior Surface of Exterior Walls	0.42	
	Total this system	$ 5.65	
		$ 5.65 / $ 82.76	**0.068 (6.8%)**
Window	Exterior Windows	$ 2.98	
		$ 2.98 / $ 82.76	**0.036 (3.6%)**
Door	Interior Doors	$ 2.67	
	Exterior Doors	0.39	
	Total this system	$ 3.06	
		$ 3.06 / $ 82.76	**0.037 (3.7%)**
Cooling / Ventilation	Cooling	$ 8.90	
		$ 8.90 / $ 82.76	**0.108 (10.8%)**
Heating	Heating	$ 8.90	
		$ 8.90 / $ 82.76	**0.108 (10.8%)**

Plumbing	Plumbing	$ 9.90	
		$ 9.90 / $ 82.76	**0.12 (12.0%)**
Electrical	Service and Distribution	$ 2.84	
	Lighting and Power	$ 8.01	
	Special systems	0.00	
	Total this system	$ 10.85	
		$ 10.85 / $ 82.76	**0.131 (13.1%)**
Conveying	Elevators	$ 1.90	
		$ 1.90 / $ 82.76	**0.023 (2.3%)**
Safety / Standards	Fire Protection	$ 1.20	
	Alarm Systems & Emer. Light	3.88	
	Total this system	$ 5.08	
		$ 5.08 / $ 82.76	**0.061 (6.1%)**
Totals	$82.76		**100%**

The values in the right column are the building system multipliers. They can be represented as a decimal value that is less than one or a percentage of the total.

The list of building systems is general, for unique buildings, some of the building systems could be merged into one (i.e. heating and cooling). In some buildings, the system may not even exist and the system could be deleted (i.e. conveying). The final building system multiplier values are than determined by the existing systems or the logically grouping of systems.

Some agencies/institutions include the architectural and contractor fees in the building system multiplier calculations. It is preferred that these fees are not included in the multiplier calculations. These fees are included when each state agency and institution of higher education fully develop a controlled maintenance, capital renewal, or capital construction project request with the appropriate scope and cost.

Depending on the similarities between different state agency/institution buildings, the building system multipliers are only needed for each unique type, not each building. More accuracy may be gained from a large number of building types, but too many types may cause unnecessary complexity and require unnecessary time. The following examples of building types were selected to be representative categories for CSU buildings, recognizing that the system and component values will vary widely between, for instance, classroom building and an office building.

Classroom (2-3 Story)
College Laboratory
Garage – Repair Shop
Gymnasium
Hospital (2-3 Story)
Library
Medical Office (2 Story)
Office (2-4 Story)
Office (5-10 Story)
Police Station
Power Plant
Recreation Center
Swimming Pool
Warehouse

H. THE FACILITY CONDITION AUDIT FORMS - GENERAL

The facility condition audit forms are separated into five parts. The first part is the name of the inspector(s), date, and building. The second part is the system characteristics. Enter the historical information obtained in the appropriate locations and modify the listing of items to match the

building system. This generally only needs filled out for the first audit. The third part is the field work. The fourth part is the calculation of the system renewal cost. The fifth part is where comments are entered to support the rating in part three and are important in that they help explain the resultant rating, provide information to prioritize the discovered system deficiencies, and provide a history for the next audit cycle.

During the field inspection the forms are used to record the information the audit team collects as they inspect the building, interview building managers, occupants, trades supervisors and other building maintenance personnel, and review records of maintenance and equipment history.

I. THE FACILITY CONDITION AUDIT FORMS - PARTS 3, 4, AND 5

Each facility condition audit form is sub-divided into specific components (1 column) and Prioritization Categories (additional columns). The prioritization categories are based that safety is the most critical and aesthetics the least critical category and are designed to support the criticality of any components rating. The Deficiency Cost column is a calculated value for a particular component as describe in a paragraph below.

Example of Part 3 of the Roofing System Facility Condition Audit Form

Part 3 Roofing Components	Prioritization Categories						System Rating Total	Deficiency Cost
	1	2	3	4	5	6		
1) Physical Condition		0.3					0.3	$ 150,323
2) Leaks		0.1					0.1	$ 50,108
3) Drainage		0.1					0.1	$ 50,108
4) Insulation		0.05			0.05		0.1	$ 50,108
5) Dissimilar Types								
6) Fire Rating								
7) Design Load								
8) Opening & Specialties		0.01					0.01	$ 5,011
9) Maintainability								
Rating System Total							0.61	$305,658

Prioritization Categories (1 being the most critical to 6 being the least critical):

1. **SAFETY** - Situations or conditions, which pose an immediate danger to life, limb or property, if the deficiency is not corrected.
2. **DAMAGE/WEAR OUT** - Potential for serious damage to the building or the building components if the deficiency is not corrected.
3. **CODES/STANDARDS** - Deficiencies of existing systems or components that were required to meet code or accessibility standards at the time of original design and construction. (Note, this criterion for Codes/Standards refers to inspection of existing conditions only. To determine deficiencies in current compliance requirements, comprehensive code and accessibility studies should be conducted in coordination with a Facilities Condition Audit).
4. **ENVIRONMENTAL IMPROVEMENTS** - Correctable deficiencies that will improve system operations and increase the comfort level of the building occupants.

5. **ENERGY/WATER CONSERVATION** - Replacing or upgrading of the operating systems to reduce energy/water consumption or increase energy efficiency in the building.
6. **AESTHETICS** - Renovation designed to improve the appearance of the building.

Part 3. When filling out this part, it should be noted that the rating for any component shall be between 0.0 and 1.0 (such as 0.20, 0.25 and 0.75) and that the rating to any component or the final system total rating cannot be greater than 1.00 or 100%. Based upon knowledge and experience, it becomes the responsibility of the inspector to determine the rating that best fits the deficiency of the component category. Since a rating of 1.0 would represent a completely deficient component or system, there should be very few instances where the total rating will approach 1.0. The ratings are based upon existing building conditions and not based upon code compliance requirements, program, or occupancy use. The inspectors need to consider the age of a component in relation to its expected useful life (previous section) and how well it has been maintained.

The inspection process is subjective, but inspectors should evaluate buildings as objective as possible. The inspector uses these priorities in scoring the observed deficiencies and they should be aware that in many instances, repair of more critical priority deficiencies cannot be accomplished without first correcting a deficiency in a less critical priority category. In this case, it makes sense to combine the deficiencies into a more critical priority category.

When the audit team has completed a building inspection, members of that team should meet and discuss their findings relative to the deficiencies noted and fill out the required form for each system. Then the components for each system should be rated and a priority assigned to each deficiency.

The example above illustrates Part 3 of the roof system facility condition audit form. The building inspection of the roofing components determined that the roof system has several areas of deterioration. 1)-Physical Condition component is determined to have a damage/wear-out priority category deficiency rating of 0.30 or 30%. This rating is entered in the priority #2-damage/ware-out column. Other areas of the roof are currently leaking and need patching. The evaluator has determined for the component 2)-Leaks the deficiency has a rating of 0.10 or 10% and since it fits the damage/wear-out category, the value is entered into column two. 3)-Drainage component is utilized since large pools of water are observed and weeds were growing in these low spots. The Drainage is considered to be damage/wear-out and the rating of 0.10 or 10% is entered into the correct column and row. 4) Insulation has been damaged by moisture and has a deficiency rating of 0.05 or 5%. Again, this is considered damage/wear-out and the rating is entered appropriately. In addition, the moisture damage to the insulation also reduced its insulation value. This damage fits a priority category of #5 Energy Conservation and the rating 0.05 or 5% is entered in the insulation row and #5 priority column. Flashing around mechanical equipment, cooling tower, hatch cover and skylights are included in 8) Opening and Specialties component. This rating of 0.01 or I.0% is considered damage/wear-out and is entered appropriately. Adding the six deficiencies ratings gives a total roof system rating of 0.61 or 61%.

This step is not necessary, but calculating the deficiency cost for any component can be useful to check the derived rating. The component deficiency is determined by multiplying the component rating times the system multiplier times the building value. Deficiency Cost = component total rating x system multiplier x building value.

Part 4 of the form is an embedded spreadsheet. The system rating and the system multiplier are multiplied together to determine the system deficiency. This value is multiplied with the building

value to determine the deficiency cost for the system. The building summary form also performs this task for all building systems and determines the current facility condition index value.

Part 5, the rating explanation, is used to add information to support the system/component ratings. For the example above, the 1) Physical Condition rating of 0.3 can be noted in the explanation section by using the row, column numbers as a reference. Thus, 1-2 could indicate that the rating of 0.3 is from weathering, age, and spot patching. As a final step, all of the notes and documentation gathered during the building inspection should be used to generate a detailed file that would justify the rating given to any of the building systems. The notes also are useful as a list of known problems to look for during the next system evaluation.

J. DEFICIENCY COSTS

After the component deficiency ratings are entered in the appropriate rows and columns of any facility condition audit form, the rating should be totaled across for a sub-total for the system component. Add the sub-totals together and place the results in the system rating total cell. This total must not exceed 1.0 or 100%.

Multiplying the total rating by the building system multiplier will yield the percent of system deficiency. This figure multiplied by the building value will give the deficiency cost for this building system for the building.

Review the above example of Part 3, for the roof and the summary form below. Look at the system multipliers form for this building and the roof has a system multiplier of 0.056. Multiplying 0.61 by 0.56 gives a system deficiency of 0.0339. The cost to repair the roof deficiency is figured by multiplying the building value of $9,014,969 by 0.0339 with a result of $305,658. Again, AE/OP fees are included in project development process and not this form.

K. CALCULATION OF THE FACILITY CONDITION INDEX (FCI) VALUE

Building Systems	System Rating	System Multiplier	System Deficiency	System Deficiency Cost
Foundation	0.25	0.023	0.0058	$ 52,014
Col. & Ext. Walls	0.55	0.048	0.0265	$ 238,448
Floors	0.21	0.138	0.0290	$ 261,236
Roof	0.61	0.056	0.0339	$ 305,658
Ceiling	0.6	0.044	0.0262	$ 236,596
Int. Walls & Partitions	0.61	0.068	0.0416	$ 375,427
Windows	0.27	0.036	0.0097	$ 87,645
Doors	0.32	0.037	0.0118	$ 106,664
Cooling/Ventilation	0.55	0.108	0.0591	$ 533,212
Heating	0.44	0.108	0.0473	$ 426,570
Plumbing	0.26	0.120	0.0311	$ 280,386
Electrical	0.39	0.131	0.0511	$ 460,937
Conveying	0.17	0.023	0.0039	$ 35,184
Safety / Standards	0.2	0.061	0.0123	$ 110,673
Totals		1.0	0.3894	$ 3,510,651

An inexperienced audit team may find it difficult to assign accurate percentages in the rating section, therefore as a check of the component rating, an inspector can work the formula backwards by computing a system deficiency cost first and then computing the system rating.

FACILITIES CONDITION INDEX (FCI)
(1 - SYSTEM DEFICIENCY TOTAL) X 100% = FCI
[1 – 0.389] x 100 = 61.1%

L. BUILDING APPRAISAL CATEGORIES

The appraisal of the building condition can be categorized by the FCI value. The categories are:

Facility Condition Categories	Facility Condition Index (FCI)
Targeted Condition:	0.86 - 1.0 (85% - 100%)
Fair - Good Condition:	0.61 - 0.84 (61% - 84%)
Poor - Fair Condition:	0.35 - 0.60 (35% - 60%)
Poor Condition:	0 - 0.34 (0% - 34%)

8. CAPITAL IMPROVEMENT MANAGEMENT DECISION PROCESS

The audits and assessments should be included in an agency's or institution's long-term capital improvement planning program. The information collected from the facility condition audit and the infrastructure assessment is used to create two deficiency lists. The first is a list of deficiencies that meet the criteria of routine maintenance projects. The list of routine maintenance projects should be prioritized based upon life safety, programs impacts, operation and maintenance impacts, and other factors unique to an agency or institution. Routine maintenance deficiencies are repaired with funds through an agency's or institution's internal operating budget. The second is a list of building and infrastructure deficiencies that may not meet the criteria to be a routine maintenance project. A state agency or institution should analyze the second list and their additional criteria to determine if the deficiencies are controlled maintenance, capital renewal, capital construction project requests or the issue should be categorized as a routine maintenance deficiency. The second list of deficiencies should also be prioritized based upon life safety, impacts to programs, operation and maintenance impacts, and other factors unique to an agency or institution of higher education. A state agency or institution should update their CM and CC/CR five year plans with projects that address the deficiencies. On an annual basis, each state agency or institution should then fully develop construction projects with the appropriate scope and cost as part of the controlled maintenance, capital renewal, or capital construction request process.

The information obtained from the facility condition audit and the infrastructure assessment is necessary to update numerous CC/CR and CM project request forms. the annual OSA forms as described in the annual OSA Budget Request Submission Instructions, and other state department annual budget request submittals. The Capital Construction/Capital Renewal Project Request - Narrative form requires information on the Facility Condition Index (FCI) value. The Controlled Maintenance - Narrative form requires the FCI value and the impact to the FCI value from a completed project. The annual building inventory report form shall be edited with the updated FCI values and the above and below ground infrastructure estimated deficiencies cost. The vacant facility management plan form requires the FCI value.

9. CAPITAL IMPROVEMENT MANAGEMENT DECISION MATRIX