

Revised Facility Audit Manual

Capital Planning Branch

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1. Overview and Instructions

This Manual describes the revised Facility Audit process applied to public elementary, middle and secondary schools in British Columbia. The Manual has three sections, as follows:

Overview and Instructions. This introductory section briefly discusses the purposes of the Facility Audit process, and provides some background information on the role of building condition assessment in facility asset management.

Audit Rating Scales and Scoring Methodology. This section describes the Facility Audit's building classification system, rating scales and broad performance criteria against which building elements are to be evaluated.

Performing the Facility Audit. This discussion includes the steps in preparation, conducting inspections and taking measurements (as required), completing the forms, and communicating the results. Examples of each checklist are provided.

Background

The Facility Audit is a building condition assessment process, developed in partnership with the School Plant Officials Association of British Columbia for use by school districts and the Ministry of Education. The Facility Audit was first implemented in 1994, to be conducted on a five-year cycle.

The Facility Audit is used to rapidly evaluate the physical condition of existing public schools. It produces standardized building condition information, enabling meaningful comparisons within an inventory of similar building types or functions. This comparison allows buildings to be ranked according to relative condition, and enables capital planning for renovation and replacement based on objectively applied criteria of condition.

For each building, the Facility Audit produces a record of:

- general characteristics of a building
- history of additions, renovations or major system improvements
- condition rating of systems and system elements
- comments on maintenance requirements
- comments on essential remedial requirements

In broad terms, the purposes of the Facility Audit are to provide the following:

1. Numerical rating, for capital planning purposes, that provides a context in which informed and optimal program and investment management decisions can be made for the asset.
2. Screening for buildings with problems in order to identify facilities that will require more detailed evaluation to determine the appropriate program and investment strategy.
3. First step in identifying potential remedies of building and functional deficiencies, and, where appropriate, the nature, cost and timing of remedial actions that may be required to address physical deficiencies.

At the school district level, the Facility Audit substantiates and offers a technically consistent measure of building condition. This enables a comparative ranking of each building that serves to identify priorities for capital improvements as part of local maintenance management and capital planning.

Standardized data on building condition also supports the forecasting and programming of future needs by school districts as well as the Ministry of Education. Condition assessment enables the estimation of the remaining service life of a facility and its various components. This information is central to the strategic planning process that determines facility needs and capital funding priorities for each school district and for the province as a whole.

Building Condition Assessment

In British Columbia, school boards are charged with the responsibility for achieving an appropriate balance between short-term operational needs and long-term asset management considerations. As the owner of the property that will be used to achieve program objectives, this balancing can often be difficult for school boards with a potential for internal conflicts.

Condition assessment is an element of building diagnostics that seeks to holistically evaluate a facility. The intent is to put the building systems and components into a useful framework or perspective from which sound asset management decisions can be made. At the simplest level, condition assessment is an integral part of maintenance and repair.

Proper planning for maintenance, repair and capital improvements depends on accurate and reliable condition assessment data. This becomes increasingly important in situations where fiscal resources are limited and must be spread over extended periods. Condition assessment therefore serves as a budget planning tool and provides the basis for allocating and directing funding to specific building problems.

Condition assessment can also determine the nature and extent of a problem as well as the options for corrective action. Another objective therefore is early identification of problems and their correction before they can become more serious, thereby preventing deterioration, possible damage to adjacent materials or system, or failure of components.

Finally, the scope of the Facility Audit process is determined by the information requirements of the school districts and the Province. The overriding objective is to spend resources on the building itself, not on the data collection process. Therefore, the level of detail is designed to enable a straightforward means of filtering assessments and priority ranking of capital project requests based upon relative needs. As a result, the Facility Audits do not require in-depth diagnostic techniques or tools.

Time vs. Condition Relationship

The following graph shows the relationship between the condition and the life of a building. This a generalized depiction of the degeneration of a building over time and how the effect of continued maintenance, renovation, renewal, and modernization extends the useful life of the building.

The Facility Audit process, then, is a strategic planning tool for developing the order of magnitude for continued maintenance, renovation, renewal, and modernization in an effort to extend the useful life of school facilities across the province.

Building Classification System

The Facility Audit adopts a standard classification of building systems and elements - the *Standard Classification for Building Elements and Related Sitework - UNIFORMAT II* (ASTM Designation: E 1557 – 96). This classification applies to buildings and related site work, including furnishings and equipment (with the exception of process equipment related to a building's functional use).

The classification system comprises three hierarchical levels:

- Major Group Elements
- Group Elements
- Individual Elements

Elements are major components common to most buildings. Elements usually perform a given function, regardless of the design specification, construction method, or materials used. The following building elements are used in the Facility Audit Detailed Checklists:

A. SUBSTRUCTURE

Foundations

- Standard Foundations
- Slab on Grade

B. SHELL

Superstructure

- Floor Construction
- Roof Construction

Exterior Closure

- Exterior Walls
- Exterior Windows
- Exterior Doors

Roofing

- Roof Coverings
- Roof Openings
- Projections

C. INTERIORS

Interior Construction

- Fixed & Movable Partitions
- Interior Doors
- Specialties

Interior Finishes

- Wall Finishes
- Floor Finishes
- Ceiling Finishes

D. SERVICES

Plumbing

- Plumbing Fixtures
- Domestic Water Distribution
- Sanitary Waste
- Rain Water Drainage
- Special Plumbing Systems

HVAC

- Energy Supply
- Heat Generating Systems
- Cooling Generating Systems
- Distribution Systems
- Terminal & Package Units
- Controls & Instrumentation
- Special HVAC Systems & Equipment

Fire Protection

- Fire Protection Sprinkler Systems
- Stand-Pipe & Hose Systems
- Fire Protection Specialties
- Special Fire Protection Systems

Electrical

- Electrical Service & Distribution
- Lighting & Branch Wiring
- Communication & Security Systems
- Special Electrical Systems

E. EQUIPMENT & FURNISHINGS

Furnishings

- Fixed Furnishings
- Movable Furnishings

F. Special Construction

Special Construction

- Integrated Construction & Special Construction Systems
- Special Controls & Instrumentation

G. BUILDING SITWORK

Site Improvements

- Roadways
- Parking Lots
- Pedestrian Paving
- Rain Water Drainage
- Site Development
- Landscaping

Site Civil/Mechanical Utilities

- Water Supply & Distribution Systems
- Sanitary Sewer Systems
- Storm Sewer Systems
- Fuel Supply
- Electrical Supply

The classification serves as a consistent reference for analysis, evaluation, and monitoring during the feasibility, planning, and design stages of buildings. Using UNIFORMAT II ensures consistency in the economic evaluation of buildings projects over time and from project to project. It also enhances reporting at all stages in construction - from feasibility and planning through the preparation of working documents, construction, maintenance, rehabilitation, and disposal.

2. Rating Scales and Scoring Methodology

The central feature of the Facility Audit process is a standardized condition assessment ranking that assigns each building element a numerical ‘observed rating’, as it compares with a ‘possible rating’. Each element has a possible rating of 10.

Completing the Facility Audit involves a discussion among a team of district staff, typically consisting of building operators and facility personnel. The rating score assigned to each component therefore represents a consensus of team member opinions, based on their best judgment and knowledge of each facility. In reaching this consensus, the audit participants must also refer to available documentation on building condition and/or deficiencies, such as inspection reports, maintenance logs, breakdown records, and user complaints.

The rating scores are indicative only and, with the exception of HVAC measurements, are not based on empirical or technical data. The scores represent how well key building components function in terms of the performance levels that the components were intended to provide in ‘as new’ condition. To a lesser extent, the rating scores reflect how well key building components are functioning in terms of the performance levels required by the current building users. For example, technologically obsolete equipment would be assigned a low rating score despite its otherwise adequate physical condition. Similarly, insufficient Internet access demands a low rating for an otherwise adequate electrical system.

The rating scales are as follows:

| | | |
|-----------------------|---|---|
| 10 (Excellent) | = | Satisfactory No improvements needed; like new or equivalent. |
| 7, 8, 9 (Good) | = | Minor Improvement Required Minor system deficiencies with only marginal effect on system functions. |
| 4,5,6 (Fair) | = | Moderate Improvement Required Deficiencies causing intermittent problems or effect multiple users. Uncorrected, will result in premature failure or accelerated deterioration of component or system. |
| 1, 2, 3 (Poor) | = | Major Improvement Required Critical deficiencies affecting function, health or safety. |
| 0 (Unsuitable) | = | Unsatisfactory Complete failure or loss of function; 100% replacement required. |

The Facility Audit detailed checklists contain suggested performance criteria for each component. For example, the evaluation criteria for **Shell: Exterior Closures** includes: *Condition; Waterproofing Operation; Caulking Appearance; Insulation Appearance; Security; Maintainability; Heat Loss/Gain; and Infiltration*. These criteria will be self-evident, with examples provided merely as prompts. The HVAC checklist contains performance measures which are specific, and require the collection and analysis of data. This section is to be completed to support any HVAC or mechanical upgrade funding requests made in a Five-Year Capital Plan submission.

For items such as site improvements and civil or mechanical utilities, the rating score should reflect not only the condition but the adequacy or sufficiency of an item (e.g., the existence or absence of exterior lighting, or the number of handicap parking spaces, etc.) Parking lots, roadways and bus drop-offs, pedestrian paving, and exterior lighting are examples of site components that should be rated in terms of quantity and area, as well as condition.

Other sections of the Facility Audit are essentially inventories. The Disability Requirements section requires the notation of the existence or absence of specific items, and is only required to support access improvement requests.

HVAC Assessment

The Ministry is currently developing a comprehensive policy framework for the management of indoor air quality in schools. It is intended that this policy will assist school districts in achieving compliance with the WCB Regulation as it relates to IAQ, and will also contain guidelines for capital project funding related to HVAC requirements. Implementation of this comprehensive policy is anticipated to occur during the 2000/01 fiscal year.

In the interim, the Ministry in conjunction with SPOA has developed the following HVAC assessment method that will assist in the evaluation of HVAC-related capital funding requests for school district buildings. The assessment method will also ensure that regular inspections of HVAC systems are conducted and documented. The assessment, which is determined by a comprehensive visual inspection of equipment, is intended to derive an accurate evaluation of the mechanical components of the ventilation system strictly in terms of their current operation, and state of repair and upkeep.

For the purposes of the HVAC assessment, it will be assumed that a comprehensive inventory of all mechanical system equipment exists and is up to date. Such an inventory includes heating plant, cooling plant and ventilation equipment. It will typically include the equipment, make, model, and rated capacity. Basic information necessary for routine and preventive maintenance will also be assumed to exist. Such documentation will include plans, specifications, addenda, and operations and maintenance manuals. The status of a Preventive Maintenance program will be noted as part of the assessment.

Visual observations will include the following items or aspects of the HVAC system:

- Cleanliness of equipment and mechanical rooms
- Heating corrosion, leaks, insulation
- Visual inspection of heating water sample
- Air filter condition
- Correct direction of rotation
- Belt tension
- Heating coil condition and access

3. Performing the Facility Audit

This section of the Manual describes how to conduct the Facility Audit, including the completion of the necessary Facility Audit forms.

2001/02 Five-Year Capital Plan Submission

Initially, school districts are required to complete a revised Facility Audit on those facilities for which renovation, replacement or mechanical system upgrade funding is being requested in their 2001/02 Five-Year Capital Plan submission. The Facility Audit results will be needed as supporting documentation for these requested capital projects. The due date for this submission to the Ministry is **June 30, 2000**. All other facility audits must be completed by **June 30, 2001**.

Although it was intended that the Facility Audit would be a single-step process, many school districts expressed a desire to have an additional, more detailed review carried out by an independent consultant in support of the initial evaluation and findings. The Ministry will therefore approve a limited number of these more detailed reviews for those capital rejuvenation projects involving schools with the lowest ranked building conditions, which are being supported in the Ministry's 2001/02 Long-Term Capital Plan for capital funding. The Ministry will advise school districts as to which facilities are to be evaluated by independent consultants as part of the ongoing capital planning process. More details on these more detailed reviews will be provided in the near future.

Preparation

A project manager should be assigned responsibility for the Facility Audit process. This person will usually be the director of plant operations or facility services in each school district.

The project manager should review the purposes and processes involved in the Facility Audit. If necessary, Capital Planning Branch staff should be consulted for clarification or further information. The project manager must then compile a list of all buildings to be evaluated.

A Facility Audit is to be completed for all operating schools, and maintenance or administrative buildings within the school district. Facility Audits are not needed for leased or closed facilities, nor facilities not receiving operating funding from the Ministry.

Many schools will have had a series of additions over the years. If a section of the overall school building is clearly distinct from other parts of the school in terms of structural design, finishes or mechanical systems, then this section should be treated as a separate facility requiring completion of a separate Facility Audit. An appropriate designation must be made the Facility Audit forms to properly identify the separate section [e.g., Johnson Secondary School: Shops Wing (1996)].

Reference information and documentation on each building should be available for the Facility Audit. This typically includes a description of the building; total number of occupants; Level I Facility Audit report; Level II Facility Audit report (if available); repair, remodeling, or modification information; roof maintenance and repair history; most recent energy use data; and any special facility-related reports, such as:

- Building operation records
- Fire inspections
- Maintenance and repair schedules
- Risk Management Branch property surveys¹
- Documentation of building problems
- Workers' Compensation Board reports
- Occupant complaint records
- Health and Safety Committee meetings minutes

Working Session

The first step with the working session team is to carefully review the building inventory data that exists for each facility. Make corrections or additions, as required. Changes are to be made directly on the forms that have been provided.

The next step is to quickly rank order the list of buildings. This ranking is based on a quick assessment of condition and will provide a useful reference point for comparisons with the final results following completion of the Facility Audit. If a building's rank order following the Facility Audit significantly deviates from its place on the initial rank order list, there should be a discussion to examine potential errors in the ranking process.

The working session team should review all available historical data, building information, previous Facility Audit reports, and any other special inspection reports. The team can then discuss each building in turn and assign a rating score which best describes the current condition/performance of all components.

Completing the Forms

For each component, identify the *closest match* between building condition and rating scales. The rating number should represent the consensus of those participating in the facility audit, based upon their best judgment and knowledge of each facility. A rating score between 0 and 10 (as described in the Section 2. Rating Scales and Scoring Methodology) should be selected and recorded in the appropriate column of the detailed Checklist. Otherwise, the term "N/A" must be recorded for any element where a rating is not applicable.

¹ Property surveys for the School Protection Program, Risk Management Branch, are conducted as follows:

| | |
|---|---------------|
| Building Value: \$1 million – \$5 million | Every 3 years |
| \$5 million - \$10 million | Every 2 years |
| Over \$10 million | Annually |

If there is some special requirement or feature of importance, explain briefly in the “Comments” area at the bottom of the Detailed Checklist. More general observations regarding a facility’s main deficiencies may be included on the Commentary form provided.

No elements should be left blank. If there were difficulties in deciding a rating score for an applicable building element, then briefly explain the difficulties and the rationale for the rating score used (e.g., what information may have been missing; or what assumptions were made) in the “Comments” area at the bottom of the Detailed Checklist.

Note: The Revised Facility Audit application has been created in Microsoft Excel. This workbook, as well as instructions, are available on the Ministry of Education Capital Planning Resources webpage, under the **Publications** section, located at:

<http://www.bced.gov.bc.ca/capitalplanning/resources.htm>