Menlo Park Fire Protection District

FACILITY CONDITION ASSESSMENT

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**Introduction**

In March of 2012, CH2M HILL (CH2M), a facilities management and engineering firm, performed a detailed Facility Condition Assessment (FCA) inspection and audit of fire stations for the Menlo Park Fire Protection District (MPFPD). This inspection consisted of eight district facilities; the District’s Administration Building, Fire Stations 1 through 6 and 77. These facilities total approximately 37,500 square feet. The consulting engagement was to provide a baseline of the physical condition, a detailed equipment inventory, and computerized report summaries in support of a capital reinvestment plan.

MPFPD required that a qualified Facilities Management/Consulting firm experienced in the condition assessment and maintenance of buildings, grounds and facilities support equipment perform a detailed, physical inspection of the eight facilities. The inspection report was to highlight and escalate any conditions that posed a risk to the safety of the public and/or employees and/or conditions that might affect the facilities ability to service its customers or staff.

CH2M was able to respond to MPFPD’s needs by providing the staff, processes and industry experience required to gather, analyze and summarize inspection data and to deliver a comprehensive Condition Assessment Report.

CH2M assigned technical staff with specific experience in auditing and maintaining buildings, grounds, and facilities support equipment for on-site inspections of the facilities.

CH2M recorded and analyzed detailed inspection data associated with the buildings and provided MPFPD with hard and soft copies of the inspection report.
Assignment Objectives

The primary objectives of this assignment were:

- Identify maintenance and asset condition deficiencies.
- Inventory all infrastructure equipment present in the buildings and tag with a unique Equipment ID and barcode.
- The audit and subsequent reporting was to be completed by June 2012.

Scope of Work

Subject matter experts inspected the building envelope, interior shell and finish and building infrastructure systems and equipment and prepared a detailed report indicating the general condition of the building components and equipment.

CH2M inspected the properties covering all inspection categories included in CH2M'S FCA program.

Deficiencies that required immediate attention were forwarded directly to the Program Manager for immediate work assignment.

CH2M understood the overall scope of work to be the following:

- Inspection
  - Perform on-site visual inspection;
  - Record, analyze and summarize inspection data and identify gaps;
  - Estimate cost of repair or replacement for significant deficiencies;
  - Inventory and tag all significant infrastructure equipment;
  - Photograph specific assets and deficiencies for reference;

- Reporting
  - Provide detail audit report for each facility;
  - Provide recommendations for remediation;
  - Detail and summary cost estimates;
  - Provide equipment inventory
  - Provide digital color photographs for reference;
  - Provide all inspection data in electronic & hard copy report.

Excluded from this assessment were, furnishings, computing, printing and telecommunications equipment, office machines and reprographic equipment. Also excluded were engineering studies and detailed non-destructive testing such as voltage, amperage, system pressures, chemical analysis, thermo graphic testing, water sampling, roof coring, etc. Recommendations for additional testing may be noted.
Assignment Approach

CH2M utilized its Facility Condition Assessment (FCA) data collection software to record and summarize the maintenance inspection data. The intent of this assessment was to identify any Deferred Maintenance Backlog (DMB) inherent in the buildings.

The physical audit consisted of a comprehensive building tours visually examining all workspace, mechanical and electrical rooms, storage, support areas, roof, equipment pads, building envelope, etc. noting any deficiencies. All building infrastructure and support equipment was inventoried and tagged with a unique equipment ID number and barcode, visually inspected for defects, normal life expectancy and deferred maintenance issues.

Building System Approach

A Building System approach to the assessment process generally yields the most comprehensive results. Visual inspection of the discreet Building Systems covered by this assessment is as follows:

- **Safety & Compliance:** Safety issues, fundamental ADA compliance and environmental, jurisdictional requirements, etc.
- **Building Envelope:** Structural integrity of walls, roof support, floor and foundation. Roofing and waterproofing, walls and wall surfaces, signage, doors, glazing, moldings, trim, gutters systems, caulking and sealants, flashings, fascia and exterior paintwork.
- **Interior Shell & Finish:** Ceilings, walls, flooring, doors & hardware, finishes, ceilings, window coverings, etc.
- **Mechanical:** HVAC equipment and controls, plumbing distribution, fixtures, DWV, drinking fountains, water softeners, boilers and water heaters, natural or LP gas supply, etc.
- **Electrical:** Main switchboards, sub panels, wiring and distribution, transformers, lighting, ancillary systems (generators, ups, transfer switching), etc.
- **Plumbing:** Potable cold and hot water supply, fixtures, piping, drains, flammable gas.
- **Fire Protection:** Sprinkler systems, detection, notification and alarm, alarm panels, jurisdictional compliance.
- **Roads, Lots & Grounds:** Paving, walk ways, lighting, signage, fencing.
- **Landscape:** Plant material, irrigation

Condition Index

Our FCA process assesses each significant building deficiency by applying three separate sets of ranking
criteria to provide a composite index to indicate the severity of individual deficiencies. This process assesses the overall criticality of any individual problem and allows a forced ranking of all deficiencies. These three criteria are: Operational Importance, Risk to Business Continuity and Current Failure Status. A forth criteria, Total Cost of Ownership, can be applied to provide further granularity if this data is available.

By assigning a ranking to an item under assessment, a more complete picture can be provided as to first, its relative importance to the operation of the building and the business and secondly, where it falls in its life cycle. This combination constitutes an index that insures a more accurate placement of the item under assessment in a forced ranking of multiple items or projects. A scale of 1-5 applies to each criterion where 5 is the highest or most critical.

Additionally, overall condition of the property was assessed to identify any gap between the Actual (or chronologic) Age of the building as compared to its Condition Age. The gap of course relates directly to the deferred maintenance backlog, decline in asset value and effectiveness of the building to perform as intended.

An equipment inventory has been provided with this assessment that notes installation dates. It is important to consider Nominal Life Expectancy of the equipment when preparing operating or expense budgets. A guide to Nominal Life Expectancy is included in the Appendix section of this report.

**Universal Deferred Maintenance Trends**

There were some observed trends in the types of deferred maintenance noted in our audit. These items are typical and will be found on deferred maintenance lists in virtually any organization. The reasons why many items wind up on a deferred maintenance list are:

- They degrade imperceptibly over time
- They are typically in low visibility areas
- They can be cosmetically managed (patched up)
- They are not a political hot button
- Too few maintenance staff to adequately maintain the facility
- There is insufficient supervision to perform the necessary oversight and audits to maintain focus and the quality of service delivery

The cost associated with this is intangible and difficult to define until something is broken enough to require substantial repair or replacement dollars.

The reason that deficiencies are on the deferred maintenance list is simple. The maintenance program is insufficient in funding, scope or staffing to manage the load. Maintenance (particularly pro-active maintenance) is a low priority until something breaks and then it becomes a high priority. This reactive or ‘run to fail’ model generally costs more money to repair than the application of a systematic Audit Process and Preventive Maintenance Program. All systems have a periodic maintenance frequency and a normal life expectancy.
Timely maintenance and/or replacement can be planned for. MPFPD recognizes this phenomenon and is working to identify their capital replacement budget to encompass replacement of worn out building components and equipment. They are to be applauded, as this approach will save MPFPD money and grief.

**General Recommendations for Improved Maintenance**

Some or all of the following recommendations may have already been implemented.

1. Improve the maintenance program in the following areas:
   - Assign responsibility of the maintenance and audit programs to a single point of contact
   - Increase the frequency of the audit program to identify and document maintenance issues
   - Define and institute a vendor pre-qualification and annual vendor performance survey to improve and insure the value derived from key vendors
   - Create an asset inventory database containing all items having a periodic maintenance requirement or a predictable life expectancy. This is the basic foundation for PM programs and any future facility master planning.
   - Initiate a PM program. This can be a simple database of assets that includes PM tasks, vendor or staff assignment and scheduling frequency data for any item requiring specific maintenance on a periodic basis. This program would also be useful to help create operating budgets and maintenance scheduling for items like:
     - Mechanical, electrical and plumbing equipment
     - Building envelope and roof inspection and cleaning
     - Janitorial services such as carpet and window cleaning
     - Jurisdictionally required inspections and certifications (Fire detection, fire sprinklers, extinguishers, elevators, generators, etc.)
     - Security equipment
     - Landscape & grounds

2. Establish a capital revitalization program based upon asset life cycles and planned replacement of obsolete buildings and/or equipment.
   - Identify those items with a definable life cycle and establish an end of life date. This tool would augment the PM program by identifying those items requiring replacement or renewal based on industry defined life cycles. This program is the basis for Facility Maintenance Master Planning and long range capital planning. This program would be used to help create long range operating and capital budgets and service scheduling for items like:
     - Roof replacement
     - Exterior and interior painting
     - Caulking and damp proofing
• Interior finishes (paint, wall covering, )
• Floor coverings (carpet, VCT, terrazzo, ceramic tile)
• HVAC equipment replacement or upgrades (chillers, cooling towers, package units, air handlers, exhaust fans, etc.)
• Re-lamp programs
• Facility renovation and tenant improvement projects

3. Improve maintenance capabilities through the utilization of a computerized maintenance management system (CMMS).

4. Proactively reduce deferred maintenance backlog that leads to accelerated condition age and reduced value and effectiveness of the building. Focus first on areas where deterioration is accelerating and potential for risk to life safety and business continuity is greatest.

5. Secure the year over year funding required accomplishing the items noted above.

6. Provide adequate staff and supervision to adequately audit and maintain the facility and support the above initiatives.

7. Factor in obsolescence as a primary driver for capital improvement, renovation or facility replacement.

Chronological Age vs. Condition Age

In summarizing and managing a building's life cycle, it is important to periodically monitor and accommodate any gap between the Chronological Age and the Condition Age of the building. Not all buildings get the same level of stewardship and do not age at the same rate.

This gap directly relates to the reduced effectiveness and life expectancy of the building. This gap or life expectancy deficit is quantifiable to a large extent and by performing periodic physical audits to note deficiencies and applying costs to them, provides a sound basis from which to project the year over year budget dollars necessary to manage the deficit for both operations and maintenance and capital renewal.

Following are the concepts we have used in this audit process to define the life cycle, condition age and remaining life of each building: (See Appendix 2).

- Normal Life Expectancy: is the industry standard nominal age for a particular type and use of building.
- Actual Age: is the number of years from the initial construction date to current date.
- Condition Age: is the assessed age applied upon completion of the audit by the auditor. A well cared for building may have a lower Condition Age than Chronological Age. Conversely, buildings with a large Deferred Maintenance Backlog may have a higher Condition Age than Actual Age.

<table>
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<tr>
<th>CONDITION AGE KEY</th>
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<tr>
<td>EXCELENT</td>
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<tr>
<td>E = Exceeds actual age by more than 6 years</td>
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Very Good 
VG = Exceeds actual age by 1 to 5 years or more  
Good G = Actual age = Condition age  
Fair F = Falls short of actual age by 1 to 5 yrs  
Poor P = Falls short of actual age by 6 yrs or more

- Remaining Life: is the difference between Normal Life Expectancy and Condition Age.
- General Condition: is the ranking system utilized to establish the relative condition of the MPFPD buildings and generally supports the Facility Condition Index.
Summary of Findings

In general, maintenance is performed in order to keep a building and its working systems in optimal condition. Deferred maintenance is maintenance that due to budgetary or other constraints has been delayed. Over time, the accumulation of deferred maintenance degrades the condition of the building to a point that reduces its ability to perform intended functions, its life expectancy and its asset value.

The results of this can undermine the effectiveness of the maintenance program in three ways. First, the building unexpectedly requires the expenditure of repair or capital replacement dollars sooner than it should thus reducing the pool of available capital money. Second, the building's occupants often suffer while working in a substandard environment reducing their effective output and moral, and third, the deferral of maintenance generally results in the premature failure of equipment and/or systems.

Key Findings

Deficiencies identified during the audit are divided into two categories based upon a threshold of estimated cost of repair. These categories are Repair items and Estimate items

For example, deficiencies that are perceived to be less than $500 are considered to be repair items. It is assumed that items on this list would be managed through the building maintenance or operating budget. These items are not cost estimated and appear in the Summary of Repairs report.

Conversely, items perceived to be greater than $500 require having formal cost estimates and reporting prepared. These deficiencies have been cost estimated and appear in the cost reporting.

The following are general observations noted throughout the eight facilities. Knowing that the oldest facilities are scheduled for demolition and replacement may temper some of the following recommendations.

Safety & Compliance:

- Insure that fire alarm and sprinkler systems meet jurisdictional requirements for inspection, test and certifications.
- Investigate whether EPA Tier 4 air quality standards apply to the standby generator.
- A couple of the older sites had inoperative or overridden auto return safeties.

Building Envelope:

- The building envelope, walls, damp proofing, finishes, roof, etc. was in good repair in the newer facilities but in poor condition in the older facilities.
- Roofing on the older facilities is at or near end of life.
- Frequency of painting of wood siding, fascia and trim appears to be insufficient to prevent some degradation of wood members. Consider increase painting frequency.
Exterior rollup doors and man doors operate as designed and are in good condition.

Glazing in most of the older facilities are OEM units with some exceptions.

Interior Shell & Finish:

- The building interior wall and door surfaces show normal ware and tare and are generally in good shape. A formal schedule of periodic paint touch up would insure the building presents well at all times.
- General housekeeping and custodial routines appear to be working well.
- Storage appears to be an issue particularly in most of the facilities. Additional shelving, racking or off-site storage would help relieve some of this.
- Carpeting is worn in several and should be considered for replacement.
- Sheet vinyl is always somewhat problematic. This was particularly true in stations 1, 3 and 6.

Mechanical Equipment:

- Nominal life expectancy of HVAC gas pack units is around 15 years. Most of the mechanical fleet throughout all facilities has surpassed this even in the newer stations. Although if well maintained, this equipment can last considerably longer but eventually maintenance costs and repair frequencies will trend upward indicating it is time to replace. It may be a good idea to begin setting aside some capital funding to support this.
- The small computer room in Station 1 was very warm. Equipment surface temp was 87-90 degrees F when laser scanned. This is extremely unhealthy for this critical equipment. It is recommended that a small mini-split A/C unit be installed to cool this room.

Electrical Equipment:

- The main switchboard and sub panels are in need of cleaning and service in most facilities. Include scan and torque of breakers and terminal connections every 3-5 years.
- The stationary generators and automatic transfer switches were reported to be exercised regularly. It was unclear whether there is a formal maintenance program connected to this important equipment.
- No records of periodic exercising of the generator were available at the time of the assessment. It would be prudent to develop a formal set of procedures and log around the maintenance and testing of these systems verifying that automatic or manual exercise program is operating as designed.
- It was unclear if the transfer switch is periodically exercised. The automatic transfer switch should be load tested on a periodic schedule to insure its operation. This requires scheduling a shutdown of main power to initiate the generator sequence and the transfer of building load through the switch.
- Additionally, the emergency generator and automatic transfer switch should be load bank tested.
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every five years to insure they are capable of picking up the connected load in an emergency.

Plumbing:
  - Although some of the plumbing in the older stations is 60+ years old, no issues were observed or reported with the plumbing supply or drain systems.
  - Station 77 has had a history of breakdowns with the sewage ejection system supporting that site.

Fire Life Safety:
  - Building is protected by zone alarm panel and wet pipe sprinkler system. No current records of periodic inspection, test and certification of these systems were available at the time of the inspection. Insure that all jurisdictional requirements are in compliance.
  - Most buildings were sprinkled with exceptions. With the exception of the Administration building which had a monitored detection panel, the sprinkled buildings had local alarms connected to flow.
  - Were the District to forestall the demolition and rebuild of the older stations, installing sprinkler systems should be considered.

Roads, Lots and Grounds:
  - The gutter and apron at Station 1 has broken down and should be considered for replacement. It is believed this is a City responsibility.
  - The concrete pad surrounding two sides of Station 4 has broken up due to settling.
  - The older stations in particular had missing, unhealthy or poorly maintained plant material; in general the stations looked ok. No significant issues with landscaping and plant material.