City of Somerville
Comprehensive Facilities Assessments, Consolidation Planning and Preventive Maintenance Plans

Proposed Scope of Work

Phase 1 - Pilot Program – Condition Facilities Assessments and Preventive Maintenance Plans

Overview

The primary objective of this pilot program scope of work is to establish optimized processes, methods, standards and systems that will be used to develop prioritized Capital Improvement Plans (CIP)s and long term Preventive Maintenance Plans (PMP)s for the City's entire portfolio of facilities. The three facilities to be included in this pilot program are:

1. Benjamin G. Brown School
2. Winter-Hill Community Innovation School
3. Somerville Recreation Building

The optimized processes, methods, standards, and systems that result from the pilot program will be utilized in future phases designed to:

- Develop and deliver comprehensive Capital Improvement Plans and Preventive Maintenance Plans for the remaining 40 +/- municipally-owned facilities for FY 2017
- Establish a sustainable long-term strategy for the City to manage the entire life cycle of its facilities in order to cost effectively deliver the level of service that City residents expect on a continuous basis.
- Select, purchase and implement a Computerized Maintenance Management Software (CMMS) package

Definitions

The following definitions will apply to this Scope of Work

Facility Type: A collection of one or more facilities that share a common purpose. Examples: schools, fire stations, libraries, city hall, garages, storage sheds are all classified as different facility types.

Facility: A structure or collection of adjacent structures consisting of at least a building envelope and a roof that share a common purpose. Examples: A school, City Hall, salt storage shed, pump station, garage buildings. 'Building' and 'Facility' are commonly used interchangeably (*but note that a Facility may be made up of several auxiliary buildings, such as a ball park with dug-outs and rest rooms*).

Asset: A physical object that might consist of a collection of parts that is most cost effectively maintained collectively over its life cycle for a specific purpose or function.

Examples: a roof section, a boiler, a pump. (*The term 'Asset' includes 'Asset Collection' within this Scope of Work unless otherwise indicated.*)

Asset Collection: A collection of objects with uniform characteristics and age that are most cost effectively managed as a single asset. Examples: all exterior windows of the same manufacturer and material (size may vary) in the same facility, all carpet on the same floor, all lights of same type within a facility.

Asset Type: A collection of one or more assets that share a common purpose within the same system that exhibit similar characteristics such as manufacturer, material and model. Examples: asphalt shingle roofs, membrane roofs, an HVAC compressor, oil fueled burners, gas fueled boilers.

System: A collection of one or more asset types that collectively are used to achieve a primary function within a facility. Examples: roofs, HVAC, electrical, plumbing. 'System' and 'Asset Class' may be used interchangeably.

Component: A part of an asset that is typically replaced if it fails or as a maintenance activity for an asset. Examples: belts, screens, filters, flashing, gutters, glass panes, light bulbs.

Systems to be considered in this Scope of Work include:

1. **Roofs.** Components include roof surface, flashings, gutters, drip edges and similar components typically included with roof systems. Each contiguous roof area of the same material and general slope is considered an asset.

2. **HVAC.** Assets and components include boilers, furnaces, ductwork, steam pipes, condensers, air conditioning, ventilation, compressors, air handlers, controllers and similar components typically included with HVAC systems.

3. **Building Envelope**. Assets include exterior facades, walls, doors and windows, skylights. *Note that roofs are considered to be a system separate from the building envelope.*

4. **Exterior Site.** Assets include fences, driveways, parking lots, sidewalks, drainage and grounds.

5. **Interior Spaces.** Assets includes walls, floors, interior windows and doors.

6. **Structural.** Assets include the structural members for building frames, floors, walls and roof structures as well as foundations. *Note that only visible parts of structural systems will be evaluated, unless specific problem areas are identified.*

7. **Electrical.** Assets include wiring, services, service panels, junctions, emergency generators, permanent lighting, outlets, ceiling fans, and similar components typically included with electrical systems. *Note – Electrical systems do not include any electrical assets connected to outlets such as monitors, projectors and lighting.*

8. **Plumbing**. Assets include piping (supply and waste), sinks, showers, toilets, pumps, vents, hot water heaters and similar components typically included with plumbing systems.

9. **Fire Protection.** Assets include sprinklers, alarms, hoses, smoke and heat detectors and fire alarm panels.

10. **Safety and Accessibility.** Assets include, railings, ramps, and similar assets required for ADA compliance.

Task 1 - Establish Preliminary Facility Assessment Parameters

Facility assessment parameters will be documented to establish criteria for target levels of service, condition, and performance for the City's facility assets. The following sub-tasks will be followed in order to establish the initial assessment parameters used in the pilot program. These preliminary facility assessment parameters will be finalized in Task 8 at the conclusion of the pilot program.

Task 1A. Prepare a draft preliminary facility assessment parameters document for City staff to review that defines the following assessment parameters:
- Level of service criteria for systems and asset types as applicable.
- Failure modes for asset types in terms of condition and performance as applicable.
- Inventory data fields for each asset type (size, material, year installed, model, etc.)
- Condition assessment data collection forms for each asset type including inventory data and condition ranking and inspector's recommended actions.
- Condition assessment procedures for field staff by asset type
- Consequence of failure (criticality) rating criteria.
- Specify how assets will be prioritized for capital projects.
- Specify guidelines for how maintenance plans will be developed

Task 1B. Conduct two facility assessment parameters workshops with City staff. Risk based prioritization methods require input from City staff in order to establish the level of service criteria, consequence of failure ratings, and other criteria used to rank assets and projects. To achieve this goal, Kleinfelder will conduct two, four hour, workshops focused on these parameters using the draft document developed in Task 1A as a guide for discussion. The first workshop will focus primarily on educating City staff on how the process works. The second workshop will focus on reviewing and updating the level of service, consequences, factors and parameters in the draft document developed in Task 1A.

Task 1C. Finalize the preliminary facility assessment parameters document based on City staff feedback.

Task 1 Deliverables:

1. Two facility assessment parameters workshops with meeting minutes (electronically distributed to all participants).
2. Preliminary facility assessment parameters document with workshop summaries (electronic distribution).

City responsibility: Review of the draft facility assessment parameters document and attendance at the two workshops.

Task 2 - Collect Existing Information and Documentation

Meet with City staff to collect readily available existing digital and paper based information and documentation for each facility in the pilot program. Information gathered will include but not be limited to: architectural plans and sketches, maintenance records, owner manuals, operating instructions, warranties, and purchase records. The information collected will be utilized to set up the data collection and inventory system in Task 3. Prepare a memorandum summarizing the data collected and important missing data that could not be collected.

> **Task 2 Deliverable:** A memo that summarizes Kleinfelder findings (electronic distribution).

> **City responsibility:** Provide Kleinfelder available documentation as requested.

Task 3 - Set Up Data Collection and Inventory System

VUEWorks software will be utilized to collect, maintain and analyze the data for the goals of the pilot program. The software is fully licensed to Kleinfelder for these purposes, and the City will not be charged any fees for its use nor be obligated to purchase the software. After the pilot program is completed, Kleinfelder will work with the City to transfer the data residing in the VUEWorks database to the City's chosen software platform under a separate Scope of Work.

> **Task 3A**. Set up VUEWorks software on Kleinfelder servers for data collection and inventory. The system will utilize a hierarchical Facility – Systems - Asset structure to capture inventory, condition and risk data. Facilities will be represented on a GIS map, enabling users to click on the facility and drill down to the data available. Data collected in Task 2 will be used to the extent possible to develop the initial inventory. Electronic documents obtained in Task 2 will be stored in VUEWorks and made accessible through the system.

> **Task 3B**. Condition forms for tablet devices will be created in VUEWorks using the parameters established in Task 1. VUEWorks MobileVUE software will be configured on mobile device hardware such as Android or Apple IPads. Kleinfelder will purchase four tablets for use on this project, and then turn over the tablets, including configured software, to the City for use in future asset management work performed by City staff. When a wireless connection is available, inspectors will be able to connect remotely to the VUEWorks software to upload field data and photographs directly into the system. When a wireless connection is unavailable, inspectors will be able to collect data in a disconnected state and upload data and photographs to VUEWorks later when a wireless connection is available.

> **Task 3C.** Train Kleinfelder's sub-consultants and city staff on the use of the field collection devices. Also train City staff on the fundamentals of accessing the VUEWorks system, finding assets, and viewing data from desktop computers. VUEWorks MobileVUE software will be configured on any additional City-owned mobile devices, if available. Kleinfelder will not provide mobile devices for use by the City, except as provided for in Task 3B.

> **Task 3 Deliverables:**
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> 1. Field data collection and condition assessment configured and running on tablet devices.
> 2. VUEWorks software configured with available inventory data.
> 3. Four hours of MobileVUE training (up to 4 City staff may attend).

4. Four hours of introductory VUEWorks desktop application training (up to 10 City staff may attend).
5. Four mobile tablet devices, including configured software, will be delivered to the City at the conclusion of this contract.

City responsibility: Provide City staff at each training session.

Task 4 – Conduct Condition Assessments

Manage the inspection teams consisting of Kleinfelder staff and sub-consultant experts. City staff will join the teams to support logistics and to provide insight on the assets as they are being inspected.

Task 4A. Develop an inspection schedule and logistics plan for the three facilities included in the pilot program. A document will be created for each facility with dates and times, special needs (ladder access, locked door access, etc.), expertise requirements and other foreseeable logistic requirements in order to optimize inspection team time in the field. A draft document will first be circulated to City staff and inspection team members for review and comment. Meet with City staff to solicit feedback. The document will be finalized in consideration to the feedback received.

Task 4B. Conduct visual condition assessments. Visual condition assessments will be performed by field inspectors accompanied by City staff on assets in accordance with the parameters established in Task 1 and the logistics plan established in Task 4A. A support team will be located at Kleinfelder offices to monitor assessment data uploads and provide technical support as required.

The VUEWorks database will be populated as a result of this work. Set up condition report templates in VUEWorks so any user can run condition reports. City staff will be able to monitor condition assessment data in VUEWorks as it is synchronized from the tablet devices in real time.

Inspection teams may encounter life-safety situations where asset failure is imminent (or has already occurred) to the extent that immediate corrective action is required to prevent injury or property damage. Kleinfelder will immediately report these situations to City staff together with suggestions to address the condition. Follow-up meetings, design of remedial actions, additional assessments, and construction phase observations associated with addressing remedial actions will be considered as additional services.

Task 4 Deliverables:

1. Coded condition assessment forms prepared in accordance with the asset assessment criteria established in Task 1.
2. VUEWorks system populated with a complete inventory of assets, condition assessment data and photographs as taken out in the field.
3. VUEWorks report templates set up so any user can run condition reports.
4. Immediate action reports, if required (electronic distribution).

City responsibilities:

1. Provide feedback on inspection schedule and logistics plan.
2. One or more City staff will accompany the Kleinfelder inspection team to provide insight and logistic support during inspections.

Task 5 – Apply Risk Ranking to Assets

Utilize VUEWorks software to calculate risk for each asset as a product of consequences of failure and failure probability according to the criteria established in Task 1. The results of this calculation will be stored in the VUEWorks SQL Server database. While VUEWorks will be used to perform the calculations for the pilot program, the results can be migrated to other systems with data connection or import capabilities. For software that does not have compatible risk calculation capabilities, the calculations can be replicated using spreadsheets or other database programs.

Create report templates in VUEWorks that can be run at any time to list assets by risk ranking for each facility and system.

Evaluate the initial risk ranking results and make adjustments to the weighting factors available to produce reasonable results (a process referred to as calibrating the risk model). Meet with City staff for review and comment. Perform further calibration based on City feedback.

> **Task 5 Deliverables:**
> 1. Calibrated risk model for all assets in the system.
> 2. Report templates set up so any person can run a risk report.
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> **City responsibility:** Provide feedback on risk ranking results.

Task 6 – Develop a Prioritized List of Capital Projects

Develop a prioritized list of recommended capital projects for the three facilities included in the pilot program resulting from inspector recommendations for each facility. Cost data will be applied to each project to arrive at an engineer's opinion of probable cost. Projects will then be ranked according to the risk rating of the assets affected as defined in Task 1.

> **Task 6A.** Develop a list of default unit costs for capital replacement and rehabilitation projects for each asset type. Sources for the costing data will be prioritized in the following order:
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> 1. City-provided costing data
> 2. Costing data possessed by Kleinfelder
> 3. RS Means
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> **Task 6B.** Develop an engineer's opinion of probable cost tabulation for each capital improvement or maintenance project for each facility. Each project will be broken down to the asset level and use units of measure relevant to the type of asset as practical (ex: roof area is measured in square feet).   The project scopes will be defined by logistical concerns and construction requirements. Each line item in the engineer's opinion of probable cost will include description quantity, unit cost, cost basis, and total cost.
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> **Task 6C.** Prioritize projects according to risk ranking of the assets contained within. Projects will be prioritized according to the asset within the project according to the criteria established in Task 1. Project rankings will be presented in a colored coded table generated in Excel.
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> **Task 6D.** Prepare a condition assessment report containing all the condition assessment data collected for each facility.
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> Meet with City staff to present the draft versions of each report for review and comment. Incorporate feedback from City staff and finalize the reports.

Task 6 Deliverables:

1. A ranked list of projects/recommendations for the three facilities included in the pilot program (electronic distribution)
2. A condition assessment report for each of the three facilities (one printed copy and an electronic file.)

City responsibilities: Provide a review and feedback on draft reports.

Task 7 – Develop Preventive Maintenance Plans

Collaborate with City staff to develop Preventive Maintenance Plans for the three facilities included in the pilot program. Maintenance activities for each asset will include activity description, frequency, and responsible party. Provisions will be provided in the maintenance plan to include budget information for each task, including estimated durations and costs for outside vendors. Asset criticality will be used to determine frequency for certain types of activity (for instance a highly critical boiler that is used to heat a school may be scheduled for annual cleaning and inspection, while an auxiliary sump pump may be tested every 2 years). The plan will be created in a tabular spreadsheet using Excel.

Meet with City staff up to five times and present the Preventive Maintenance Plans for review and feedback during stages of development.

Task 7 Deliverable: Preventive Maintenance Plans for each Asset (electronic distribution).

City responsibilities: Provide review and feedback during development of the Preventive Maintenance Plans.

Task 8 – Finalize Facility Assessment Parameters

The preliminary facility assessment parameters developed in Task 1 will be updated in accordance with what was learned and modified during the course of the pilot program.

- Meet with City staff to discuss lessons learned and adjustments to be made to the facility assessment parameters.
- Produce a final version of the facility assessment parameters document based on discussions with City staff.

The facility assessment parameters document will be used as the basis for standard processes, criteria and methods to be used to assess the condition and develop comprehensive Capital Improvement Plans and Preventive Maintenance Plans for the entire portfolio of facilities owned by the City in future tasks.

Task 8 Deliverable: Final facility assessment parameters document (electronic distribution)

City Responsibilities:

1. Meet with Kleinfelder to discuss lessons learned and adjustments made.
2. Provide review and feedback on the final facility assessment parameters document.

Task 9 – Develop Specifications for a Computerized Maintenance Management System
Utilizing the facility assessment parameters document and knowledge gained about City operational needs during the pilot program, develop a specification for a Computerized Maintenance Management System (CMMS) for the City.

- Meet with City staff to discuss software system needs.
- Produce a draft version of the software system specification and submit to the City for review and comment.
- Incorporate feedback from the City and finalize the software specification document.

The document will be written so that it can be easily incorporated into a request for proposals from software vendors.

Kleinfelder is available, as an additional service, to assist the City in the software system selection process and in the ensuing implementation.

> **Task 9 Deliverable:** Specification for a Computerized Maintenance Management System
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> **City Responsibilities**:
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> 1. Meet with Kleinfelder to discuss software system needs
> 2. Provide review and feedback on the draft version of the specifications

Task 10 – Project Management and Administration
Coordinate contractual issues with the City; monitor and coordinate workload, staffing, and sub-consultant's schedules and budgets; coordinate sub-consultant duties and review vendor invoices and schedules.

Prepare monthly detailed invoices including a report of monthly activities and a cover letter for submission to the City. Invoice details will include contract amount, amount previously invoiced, current invoice amount, amount invoiced to date and the remaining contract amount.

Prepare a monthly status report indicating work completed, work on-going, and upcoming work as well as a summary of issues addressed and issues remaining. Prepare an initial project schedule and monthly schedule updates, including tracking work completed during the monthly reporting period, new work added to the schedule, and changes in logic or anticipated durations.

> **Task 10 Deliverable:** Monthly invoices and monthly status reports.

Phase 2 – Consolidation Planning – Program Analysis

Task 1 – Develop Organization Chart
Meet with City staff to develop an up-to-date organization chart for all city departments in consultation with City staff.

> **Task 1 Deliverables:** Updated organization chart showing key City Departments (electronic distribution).
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> **City Responsibilities**: Attend meeting and provide information on City organization

Task 2 – Department Head Interviews

Task 2A. Interview Department Heads and key staff to identify:
- Department mission and long-range vision.
- Services currently being provided, and services that the department would like to provide in the future.
- Current administrative and operational issues affecting the delivery of services.
- Intra- and inter-departmental relationships.
- Locations of current offices and department staff.
- Future trends that will affect future administration, operation, delivery of services, space requirements, number of personnel and IT needs.

We propose to conduct up to 22 interviews with the following City departments, Boards, Commissions and Authorities:
- Animal Control
- Communications
- Constituent Services
- Department of Public Works
- Elections
- Environment
- Mayor's Office (including Board of Alderman)
- Finance (including Board of Assessors)
- Fire Department
- Health and Human Services (including the Council on Aging)
- Information Technology
- Law Office
- Libraries (including Library Board of Trustees)
- Personnel
- Police Department
- Recreation and Youth (including Recreation Commission)
- Strategic Planning and Community Development
- Traffic and Parking (including Traffic Commission)
- Veteran's Services
- Land use boards (Planning Board, Conservation Commission, Board of Health, Historic Preservation Commission and Zoning Board of Appeals)
- Commission for Persons with Disabilities
- Somerville Housing Authority (including Affordable Housing Trust Fund and Fair Housing Commission)

We do not propose to include the School Department in this consolidation planning study.

Task 2B. Develop a summary report summarizing the department interviews, including current and long-term needs, especially as these needs affect future space needs.

Task 2 Deliverables: Summary reports for each department interviewed (electronic distribution).

City Responsibilities: Have Department Heads and key staff attend interviews.

Task 3 – Program Analysis

Task 3A. Develop a city-wide program analysis describing current and projected program requirements for each department with potential options for programmatic consolidation to balance the needs of improving service delivery and reducing costs. Options might include:

- Administrative consolidation
- Operational consolidation
- Selected geographical consolidation and space optimization
- Full or partial merging with other departments

Develop graphics to illustrate programmatic adjacencies and geographic distribution for current conditions.   Also show graphics of how these adjacencies and geographic distribution graphics would be affected by implementation of the various options for modifying programs.

Obtain and review information from City departments regarding availability of floor plans as CADD files for existing space, and identify gaps in available data. Identify where conversion from paper documents to CADD is required. Also identify where no floor plans are available, requiring the need to take field measurements and develop CADD plans.

Task 3B. Meet with City staff (up to three meetings) to review the program analysis and the available and missing floor plan data. Together with City staff, develop the scope of services to be implemented in a subsequent phase of space analysis and consolidation planning.

Task 3 Deliverables:

1. Program analysis for each department studied (electronic distribution).
2. Summary of available and missing floor plan data.
3. Draft scope of services and fee for space analysis and consolidation planning to be performed in a subsequent phase.

City Responsibilities:

1. Review program analyses for all departments included in the study.
2. Assist in obtaining available floor plan information.
3. Attend meetings.
4. Review and comment on proposed scope and fee for follow-up phase of space analysis and consolidation planning.