CIP Building Electrification Project Pre-Scope/ Design Checklist

Capital Improvement Program, Architecture & Engineering

This CIP Building Electrification Field/Pre-Scope Design Checklist is a required component of CIP Electrification Scoping and part of a necessary process for Local Law 51/23 compliance - Green Building Standards: Update of Local Laws 31/32

It is a tool to be completed as a collaborative effort between SCA MEP and Building Envelope design teams at the beginning of the development of the CIP Building Electrification Field Report and is critical in the creation of a comprehensive Final Scope Report for the electrification of the existing building.
The purpose of the CIP Building Electrification Field Report is to evaluate as many of the relevant and significant existing building envelope and MEP systems conditions found at the existing school building in order to explore the feasibility of converting from on-site fossil fuel use to the exclusive use of all electric energy.

Objectives

- To develop a standard scoping methodology to evaluate the opportunities/challenges in existing school buildings to achieve an acceptable design for the elimination of on-site fossil fuel use and the application of all electric HVAC, Domestic Hot Water (DHW), food service/culinary art cooking and other types of educational program space (Science Labs, Vocational Shops, other) use of fossil fuels.

- To examine an existing building for the purpose of developing an Electric Power Budget (EPB) and the assessment/coordination of Architectural/Structural work impacted from the selection of electric space heating, air-conditioning, domestic hot water heating, food service cooking, and the replacement of educational program use of natural gas to all electric energy.

- To evaluate the possibility of a Geothermal system using screening tool and engineering analysis of the comparison with other heating/cooling alternatives: Greenhouse gas emissions, air pollutants, annual electricity consumption and peak demand reduction, a potential revenue stream generated from the peak demand reduction using a dollar metric and fuel and power cost, etc.

- To create strategic building electrification by prioritizing the strategic coordination with planned building envelope performance improvements, and where feasible, to facilitate the potential impact to reduce electric service requirements and HVAC equipment building heating, cooling, domestic water heating and electrical service loads to prioritize the strategic coordination with planned building envelope performance improvements and, where feasible, facilitate the potential to reduce building heating, cooling, domestic water heating and electrical service loads.

- This Project Pre-Scope/Design Checklist is intended as a starting point to perform a thorough and complete analysis of the feasibility of implementing different HVAC & DHW equipment/system selection(s) to achieve the Project Goals & Objectives. Further development and refinement of this Checklist is expected with its beneficial use.

A. **Mechanical/Plumbing Scoping - Preliminary Considerations**

1. Categorize the existing Space Heating System:

    a. Central oil/gas-fired boilers generating:
        1) Steam
        2) Hot water

Serving (all that apply):

1) Air-handling unit coils
2) Duct heating coils
3) Fan-coil units
4) Unit ventilators
5) Cast iron/fin-tube heating elements

b. Packaged oil/gas-fired warm air furnace supplying air to:

1) Gymnasium/Gymatorium
2) Auditorium
3) Cafeteria/Kitchen
4) Other Public Assembly Spaces or Common areas
5) Classrooms/Offices

2. Categorize the existing domestic hot water heating system, including:

a. Tankless boiler DHW heating coil(s)
b. Boiler steam to DHW converter(s)
c. Indirect boiler steam DHW storage tank
d. Oil/gas-fired DHW storage tank
e. Electric heated DHW storage tank

3. Identify opportunities to de-couple the dependence of Public Assembly Spaces and other Common areas in the building on the Central oil/gas-fired boilers, including:

a. Electric Single Zone Air-source Heat Pump Air-handling/Rooftop Units equipped with Energy Recovery Wheel (ERW), electric heating coil, and Demand Controlled Ventilation (DCV) control.

4. Identify opportunities to de-couple the dependence of Classroom and Administrative areas in the building on the central oil/gas-fired boilers, including:

a. Electric Multi-zone, Air-source Heat Pump Variable Air Volume Air-handling/Rooftop Units equipped with an Energy Recovery Wheel (ERW), electric heating coil and Demand Controlled Ventilation (DCV) control.
b. Electric Single Zone Air-source Heat Pump Vertical Unit Ventilator (VUV) Units equipped with Energy Recovery Wheel (ERW). Provide supplemental and/or backup redundant electric heating (electric baseboard, integral electric coils in VUV Units) to spaces with high perimeter heating load.
c. Electric Multi-zone Air-source Heat Pump Variable Refrigerant Flow (VRF) ductless/ducted Fan-Coil Units FCU) coupled with electric Air-source Heat Pump Dedicated Outdoor Air System (DOAS) Air-handling Unit equipped with ERW and electric heating coil. Provide supplemental and/or backup redundant electric heating (electric baseboard, integral electric coils in FCUs) to spaces with high perimeter heating load. As an option to utilizing a DOAS Air-handling Unit, an Energy Recovery Ventilator (ERV) could be used in each space utilizing two window louvers (one for outdoor air intake and the other for exhaust) if there is limited room to run DOAS ductwork.
d. Where Classroom and Administrative area space heating is provided by a central building hot water heating system, consideration can be given to the application of an electric Air-source Chiller/Heater Heat Pump to replace existing oil/gas-fired boiler equipment. Electric boilers

will be provided to provide supplemental and/or backup redundant heating capacity for the central system.

e. A condition assessment of existing hot water supply/return piping configuration (primary, primary/secondary pumping), space heating and ventilation equipment (air-handling units, unit ventilators, fan-coil units, cast iron/fin-tube heating elements), hot water pumps and system controls (pneumatic, electric, direct digital control-DDC) should be performed and ranked in terms of remaining useful life, design justification for continued use, replacement in kind (note existing pneumatic systems are not to be replaced in kind) or upgrade to more effective/efficient space terminal/central plant equipment and control.
f. Identify the opportunities to de-couple entrance vestibules, stairway, corridor spaces, toilet rooms, utility spaces and janitor closets in the building from dependence on steam/hot water heating systems, and utilize electric cabinet heaters, electric convectors, electric baseboards, electric door air curtains (for entrance vestibules) and electric unit heaters.

5. Where new HVAC equipment (Rooftop Unit, Condensing Unit, Air-source Chiller/Heat Pump) is located at the exterior of the building (Roof, @ grade in the school yard), consideration should be given to the potential for exterior noise transmission outside to inside (affecting school program spaces, affecting neighboring properties). Sound Power Data: Lw (in the appropriate Octave Band Center Frequencies) should be obtained from the HVAC equipment manufacturer for performing a preliminary acoustical analysis.

   a. The design of noise control is to be checked by an acoustic consultant. This needs to be done early in the process.
   b. Multiple options should be given to the acoustical consultant for review for equipment in classrooms early in the process.

6. Where all air heating/cooling systems (air-handling units, rooftop units) are existing or proposed as new, evaluate the extent of existing ductwork that can be abandoned, demolished or kept intact for beneficial use. Consider the age and operating condition of existing ductwork and that existing ductwork typically lacks air-tightness integrity (leakage), adequate insulation level and balancing capability. Only re-use existing ductwork where strategic value can be justified or if significant challenges are present to the proper sizing, arrangement (interior, exterior) and routing (horizontal, vertical) of new ductwork through the building. Provide inspection of fire dampers and functional testing of combination fire smoke dampers (FSD) and control devices for existing duct systems that will remain in use. If existing ductwork is proposed to be reused that has unacceptable leakage rates, the ductwork must be able to be internally sealed with a mist type or liquid type sealant. Feasibility of internally sealing existing ductwork depends on if the ductwork is exposed or concealed, and what the access is to large gaps (i.e., gaps of a size where the internal duct sealant can't seal) that must be mechanically repaired. Additionally, consideration must be given to the number of existing dampers and duct sensors (temp sensors, smoke sensors, etc.) that must be isolated since they would otherwise not function if the internal sealant was directly applied to them.

7. Identify opportunities to de-couple the dependence of building domestic hot water systems (DHW) on central plant oil/gas-fired boiler equipment and/or the use of oil/gas-fired DHW storage tank equipment, including:

   a. Integrated Electric Air-source Heat Pump Storage Tank domestic hot water heater(s) equipped with an integral electric coil.
   b. Central Electric Air-source Heat Pump domestic hot water heater(s) coupled with a supplemental auxiliary/backup Electrically heated Storage Tank(s).

B. **Architectural/Structural Scoping - Preliminary Considerations**

1. Review the Building Condition Assessment Survey (BCAS) to identify Building Envelope Conditions and Deficiencies. (Note Condition Ratings for major Building Envelope components on a scale from 1 to 5).

2. Inspect all building envelope components for water and air infiltration issues and other deficiencies (cracks, spalls, etc.) that will affect wall performance.

3. Evaluate the impact of Architectural and Structural Considerations on the "best fit" preliminary selection of new electric HVAC & DHW equipment, including:

    a. Floor to slab heights (including allowance for structural beams); Width of perimeter windows and clearance above for arrangement and connection to new RTU/AHU/VUV/VRF/FCU ductwork. Floor to floor, floor to slab, floor to lowest beam, consistent ceiling obstructions (piping, ducts, conduit, etc.)
    b. Impact of new louvered openings in exterior wall and window openings. (See additional notes under “Windows”)
    c. Impact of duct removal or replacement on ceiling and lighting systems.
    d. Impact of removal of existing reinforced cast-in-place roof curbs with rebar dowels anchored to the roof slab.
    e. Impact of new duct work on the interior of PA spaces, especially Auditoriums
    f. Impact of new HVAC equipment on Classroom layout (seating, occupancy).
    g. Location, arrangement and size and of existing floor openings/shafts for routing new ductwork, piping and electrical conduit.
    h. Roof repairs (a roof under warranty, shall be repaired by a certified contractor). (See additional notes under “Roofs”)
    i. Impact on Kitchen Exhaust System.
    j. Structural load-bearing capacity of existing roof construction.
    k. Structural load-bearing capacity of existing floor construction.
    Impact of existing cinder concrete and terra cotta arch framed slabs where they occur.
    l. Weldability of existing building steel and equipment dunnage.
    m. Existing equipment/utility room floor space, clearance/service clearance, floor-to-slab heights, and available louvered wall openings.

4. Evaluate the impact of Architectural and Structural considerations on the configuration of all new/supplementary electric service equipment, including transformers, switchboard equipment (including conduit pull space, fire pump tap, main breaker/CT/utility meter cabinet, distribution load breakers section), distribution lighting/power panels, additional incoming electrical service conduits, and other equipment.

5. Electric service equipment of 1,000 kVA or more (new or modified) will require the review and evaluation of allowable clearance requirements and path of egress and egress door hardware requirements that must be accounted for in the design of equipment spaces.

6. If electric service and distribution equipment is recommended for replacement, provide for dual egress requirements where service equipment is over 1200 amperes and board lineup is over six (6) feet or justify using allowable exceptions. Non-compliance must be supported with proper documentation showing approval from the New York City Department of Buildings. Where there is a condition of non-compliance, a written justification (using allowable exceptions) must be prepared for review/approval by the New York City Department of Buildings.

7. When the utility company requires a transformer vault, the vault room shall be constructed of fireproof materials with a minimum fire resistance separation rating of three (3) hours. Sidewalk vaults should be evaluated for impact to street trees and filing with Parks, especially if trees are required to be removed.

8. Address the need to comply with the ADA requirements based on the value of alterations to a school compared to the value of the existing school.

C. **<u>Building Envelope Scoping - Preliminary Considerations</u>**

a. Evaluate Building Envelope conditions to determine deficiencies that may require repair or replacement to bring the building into good repair and achieve a water-tight building enclosure. Such investigations shall be performed to identify opportunities to also enhance building envelope performance and reduce loads. An Early Scope Energy Model shall be performed during the Field Report phase to determine the potential impacts of proposed building envelope improvements on the load estimation and potential energy use and carbon reductions that could be anticipated. Local Law 51 compliance requires an early assessment that could result in mechanical system downsizing and working toward LL51 compliance.

b. An initial comprehensive investigation of all Building Envelope categories and components shall be documented in the Electrification Field Report. The AEOR shall perform an initial review of the latest Building Conditions Assessment Survey (BCAS) Report to identify documented Building Envelope Deficiencies, conduct an interview and walkthrough of the building with the Building Custodian and compile an Interior Active Leak Record Form confirmed by the Custodian to identify areas of water infiltration and interior damage that may require building envelope repairs prior to implementation of the Electrification project. Refer to the Building Envelope Scoping Guidelines for a further description of Building Envelope investigations. The preliminary findings (deficiencies) shall be documented in the Electrification Field Report. If building envelope deficiencies are significant and must be addressed prior to completion of the Electrification project, a Building Envelope Field Report may be required to document the preliminary findings and proposed Specialty Testing to confirm the source(s) of water infiltration and other deficiencies that need to be addressed as SCA Additional Recommended Items in the Scope Report.

c. Following are items to be evaluated for each Building Envelope Capital Category:

a. <u>Exterior Masonry (Exterior Walls, Chimneys, etc.) and Parapets</u>

1) Evaluate the condition of exterior walls beneath the window openings where any terminal units (e.g., radiators or convectors) will be removed and/or when refinishing of the interior surface is required. Where the existing terminal units are removed and refinishing will be required, provide a hygrothermal analysis and assess the potential for the installation of interior insulation comprised of continuous board insulation (not batt insulation) in a metal stud wall) and air vapor barrier to mitigate thermal discomfort and simultaneously improve the hygrothermal performance of the wall. Interior insulation is typically done only on the wall beneath the windows, though there may be instances where the entire wall is justified. The design team shall assess obstructions and utilities on the walls to determine installation requirements.
2) Evaluate the condition of existing stairway enclosures, elevator shaft vents and other outdoor air- intakes and exhaust openings integral to the building envelope to provide motorized or (where permitted) non-motorized gravity weather dampers. Outdoor intake and exhaust dampers shall be capable of closing automatically when the air-handling systems and/or spaces they serve are unoccupied.

3) Evaluate the condition of abandoned chimneys, incinerator chutes and other building utility shafts that communicate directly with the outdoors to provide weather closure, seals or weather dampers to minimize the uncontrolled movement of air into or out of the building (stack effect).

b. Windows

1) Evaluate the condition of existing windows and intake/exhaust louver openings that may require replacement or that may be considered collateral work with other interior renovation work or building envelope project work. Include a description of the existing window types and locations (double hung, projecting (outward or inward type), fixed), glazing type(s), framing materials (wood, metal), configuration (single, ganged, triple, etc.), and if there are any obscured glazing, insect screens or interior/exterior guards. Where the replacement of windows is to be performed, upgrade windows to match the SCA standard. Evaluate the benefits of adjusting the solar heat gain coefficient of the window glazing based on the orientation utilizing energy modeling to optimize building Energy Use Intensity (EUI) and to reduce cooling energy and electric service loads. If existing buildings have ribbon type windows, evaluate what structural reinforcements would be required if window lites were to be removed and replaced with louvers. Consider the cost of reinforcement of the existing windows versus replacing the ribbon windows instead.

c. Exterior Doors/Building Entrances

1) Evaluate the condition of existing building entrances for opportunities to improve weather protection with the provision of an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules should be designed so that in passing through the vestibule the interior and exterior doors don't need to open at the same time. Equipment provided for heating vestibules shall be provided with automatic controls capable of shutting off the heating function when the outside air temperature is greater than 45°F. When the outdoor temperature is less than 45°F, vestibules shall be maintained at an interior temperature of not greater than 60°F during scheduled occupied periods and 55°F during scheduled unoccupied periods.
2) Evaluate the condition of existing access opening assemblies (passage doors, access doors/hatches, door frames) to shafts, chutes, stairways, and elevator lobbies from conditioned spaces for the provision/replacement of gasketing, weather stripping and air barrier sealing to reduce uncontrolled air movement into or out of the building.
3) Evaluate the condition of existing loading dock/cargo door openings for the provision/replacement of weather seals to restrict outdoor air infiltration and to form a tight seal along the top and sides of vehicles engaging the dock entry/doorway.

d. Roofs

1) With the placement of major Mechanical/Electrical equipment at the building roof level, evaluate whether the entire (or select roof) area(s) should be replaced. Consider the potential for roof warranty issues or damage to existing roofing systems if equipment supports are replaced at a later date (support curb or steel dunnage installed beyond the scope of work related to roof replacement projects). Refer to Design Requirements for roof access requirements. Additional roof ladders or other means of access may be required. Evaluate zoning requirements for rooftop equipment.
2) Where the replacement of an entire existing roof deck or roof assembly is to be performed, provide a "Sustainable Roofing Zone" (Ref. NYC Local Laws 92 and 94 - 2019), 100 percent of which must be a solar photovoltaic electricity generating system, a green roof system, or a combination, in compliance with NYC Electrical, Fire Code, and

NYC Zoning Resolution. FDNY access to the rooftop(s) is required by Code (2022 MC 304.13, FC 504.4). Existing and potentially new obstacles must be taken into account during the scoping process.

3) Where the replacement of an entire roof membrane is to be performed, upgrade roof insulation to R-40. Evaluate if the upgrade from R-33 code minimum to R-40 will trigger additional work beyond what would be required for R-33. Assess parapet heights, door sills, roof vents, scuttle hatches, and anything else that may need to be moved to ascertain the elements impacted, with the caveat to return to the 2020 NYC Energy Code (EC) minimum R-33 insulation if the R-40 target results in significant changes to the elements.
4) Where an existing roof smoke vent/roof hatch is to be replaced or a new roof smoke vent/roof hatch is to be installed, upgrade to be thermally isolated and to have minimum 3" thick rigid polyisocyanurate insulation per Section 07720.
5) Major Rooftop Mechanical and Electrical equipment shall be mounted on steel dunnage with raised walkways for equipment service, concrete curbs, or prefabricated seismic/vibration isolation curbs. Preference for RTUs and AHUs is to utilize steel dunnage. Steel dunnage reduces the chances for condensate leaks from units entering the building and also allows more space to place silencers and other items to meet acoustic requirements.
6) Equipment support elements should not restrict clearance to roof systems for inspection, repair, or replacement. Specify dunnage materials (painted steel, galvanized steel) and identify any requirement to protect metal surfaces (remove rust, prepare and paint, cold galvanizing).
7) The height of the steel dunnage above the finished roof surface shall be adequate to maintain and replace the roof assembly in the future. Follow the recommendations presented in "Guidelines for Roof Mounted Outdoor Air-Conditioner Installations", ARI/SMACNA June 1977 and SCA Design Requirement 4.4.2.5.
8) Elevated roof-mounted equipment service walkways, if required, shall be metal platform, a minimum 24" wide. The length of the platform shall be sufficient to serve one or multiple equipment access panels. At locations where access panel/door swings into the platform, the width of platform shall be such that it is at least 20" in width beyond the swing of the panel/door.
9) The surface of platforms shall be non-skid with open grates. Platforms shall have an OSHA compliant ladder/stair. Platforms shall be located at "sill level" or such that the relative height between the platform surface and the top of the access panel/door is no more than 7'-0".
10) Platforms are to have a minimum 3'-6" high railing system at all open sides. For platforms greater than four feet above the adjacent roof, provide a toe board along all open sides (i.e., sides that are not against the side of the equipment served). Where the top of roof mounted equipment must be serviced, provide an OSHA compliant ladder for access.
11) Service walkway platforms ladder/stair structures shall be constructed to be removable to facilitate roofing and flashing during roof replacement or any other related work that requires re-roofing.
12) Curbs shall be used at duct and piping roof penetrations. For smaller equipment (exhaust fans), or if project requirements limit height of units above the roof, curb mounted equipment is to be used such that the height of the curb is 12” to 18” above the finished surface of the roof (top of paver in a protected membrane assembly). For reroofing applications, 20” minimum clearance is typically sufficient to allow reroofing as long as penetrations are reachable from the side to be flashed.

e. Below Grade Components (Flood Elimination Capital Category)
   1) Evaluate the condition of below grade components and identify if there are areas of active water infiltration that are occurring that may affect building critical equipment that will remain or be added at the below grade areas. Perform a visual inspection and interview the building custodian to determine the location and frequency of water infiltration or interior flooding. In conjunction with the project Civil/Geotech Engineer(s) investigate the source(s) of building deficiencies that are contributing to the water infiltration and perform testing as appropriate to confirm sources and conditions.
   2) Perform a Flood Risk Analysis to identify entry points and areas of flood risk. Review the Flood Risk Analysis, Mitigation and Flood Emergency Preparedness Scoping Guidelines and the requirements of DOB Appendix G and other Local Laws where applicable. Determine if the school site falls within a Flood Zone or is subject to local flooding conditions that may affect placement of the building equipment in below grade spaces or portions of the building below the established Design Flood Elevation.

D. **Electrical Scoping - Preliminary Considerations**

1. Establish an Electrical Power Budget (EPB) for the building, including:

   a. Existing electric service capacity (Ampacity, kVA, kW)
   b. Existing Connected load (Ampacity, kVA, kW) including:
      1) Lighting load
      2) Plug load
      3) Large motor loads (elevator, chiller, fire pump, large fan/pump)
   c. Connected load utilization (30%, 60%, 90%, other)
   d. Existing electric service capacity allocated for future space cooling equipment.

2. Based on the EPB established for the building, determine the Reserve Electric Service Capacity (RESC) available for converting space heating, Domestic Hot Water (DHW), food service/culinary art cooking and Science Lab/Vocational Arts educational program equipment to an all-electric fuel source.

   a. To calculate the RESC, utilize existing electric demand (kW) history available from DCAS to check the base building peak electric load. All major HVAC, Plumbing and other electric appliance/equipment to be removed shall be deducted from the historic peak demand to determine the adjusted peak load and Reserve Electrical Service Capacity.

3. With a "best fit" preliminary selection of new electric HVAC & DHW equipment, identify the net shortfall of available electric service capacity required to undertake the electric conversion of space heating, DHW, food service/culinary art cooking and Science Lab/Vocational Arts educational program equipment. Note that HVAC heat pumps utilized for space heating shall be provided with electric backup redundancy heating to provide 75% of the heat pump heating capacity (assuming 50% energy recovery wheel efficiency to account for fouled energy recovery wheel).

4. Prepare a Draft Electric Utility Load Letter for the proposed scope of work to meet the net shortfall in existing electric service capacity. The Load Letter should describe the required scope of work; list all new connected electric loads including the largest electric motor size(s), list all existing connected electric loads to be removed, identify the request for the requirement for providing a new Point of Entry (POE), identify existing POE must remain operational at the same time, request determination of the available Utility service and fault current. State that the new proposed load is resistive heating and that the winter load is the highest load to ensure Con

Edison evaluates the service request in accordance with the proper loads since Con Edison does not currently have historical figures on electrical resistive heating.

5. The following method for preliminary sizing of new/supplementary building electric service may be considered:

   a. Confirm the Utility Supplier for the Project location (e.g., PSEG-QN, Con-Edison-BX-NY-BK-QN-SI). Confirm available Utility voltage (208 V, 460 V). Note that the preference is 460V, since the large HVAC equipment is typically powered by 460V. A transformer is required for step up if 208V service is provided to match the 460V mechanical equipment.
   b. Calculate new/supplementary electric service load as per NEC guidelines - Limit each service switch and switchboard size to no more than 4,000 Amps, evaluate the potential growth in connected load, and evaluate existing/new large motor starting method(s).
   c. Obtain short circuit values from the Utility based on their distribution system model (sub-station, transformer, breakers) suitable to perform short circuit analysis calculations.
   d. Review available specifications of the Utility transformer feeding the building electric service including kVA rating and % Impedance (Z) where available (pad mounted transformers when provided). Allow for an increase in available short circuit current from large building motor loads.
   e. Select a standard interrupting rating (AIC, kAIC, kA) value greater than the available Utility fault Current and appropriate for the type of building service/distribution equipment used (e.g., switchboard, switchgear, main distribution panel).

6. Where affected by the primary scope of work, identify the impact on building interior/exterior lighting systems, low voltage electrical systems, including fire detection and alarm systems (including Ansul system, emergency voice/alarm communication, deluge water curtain), carbon monoxide detection and monitoring, natural gas and A2L refrigerant leak/overpressure alarm systems, auxiliary signal systems, etc.

E. **<u>Fire Protection Scoping - Preliminary Considerations</u>**

1. Categorize the existing sprinkler and standpipe system(s) (including):

   a. Supply of water

      1) House tank
      2) Pressure tank
      3) Dedicated City water fire service
      4) Combined City domestic water/fire service
      5) Sprinkler booster pump/Fire pump

   b. Sprinkler system

      1) Limited area(s) sprinkler protection
      2) Fully sprinklered building
      3) Wet system (other)

   c. Standpipe

      1) Wet automatic
      2) Combination sprinkler/standpipe
      3) Dry Manual
      4) Class I (other)

2. Evaluate the cost impact of the primary scope of work to determine if derivative sprinkler/standpipe work is required by Code

    a. As per Section BC 901.9.4.2, if the value of alterations of a space is between 30% and 60% of the value of the existing school those portions of the school being altered shall be made to comply with the sprinkler/standpipe fire protection requirements of Section BC 901.
    b. As per Section BC 901.9.4.1, if the value of alterations to a school equals or exceeds 60% of the value of the existing school, the entire school shall be made to comply with the sprinkler/standpipe fire protection requirements of Section BC 901, as if the school were hereafter erected.