NEW YORK CITY SCHOOL
CONSTRUCTION AUTHORITY
ARCHITECTURE & ENGINEERING

2005-2009 FIVE YEAR CAPITAL PLAN
CAPITAL IMPROVEMENT PROGRAM (CIP)
CAPITAL CATEGORIES
PLUMBING & DRAINAGE SCOPING GUIDLINES

GENERAL GUIDELINES

Following is a description of the major Capital Categories funded for the Capital Improvement Program that have Plumbing & Drainage work either as a P&D Capital Category project or for a Capital Category of another trade for which P&D work in involved. The categories and associated nodes have been mostly generated from the Baseline Condition Assessment Survey (BCAS). In general, the designer is required to perform a comprehensive and thorough inspection of the funded Capital Categories and prepare a detailed Scope Report to include the findings and recommendations.

For the Plumbing & Drainage Capital Categories, the Scope Report under 'Building History' heading should include relevant facts about the school such as: date of construction, total area, number of floors, number of students, maximum elevation, property line, school building property line in reference to the adjoining properties, school academic function (Health Professions, Performing Art, Automotive, Aviation, etc.), community use of the building, number of schools housed in the same building and SHPO eligibility.

It is imperative to provide a historical, detailed narrative describing the P&D upgrades the building has undergone including the LLW# & Design # and date of completion. The designer must check the Alchemy database to review the previous P&D design projects. Also, attached to the Scope Report should be photographs showing the equipment and devices. All major observations stated in the findings must be supported with cross referenced photographs.

The goal is, in a cost effective manner, to upgrade the P&D systems to serve the school premises for the foreseeable future.

1. FLOOD ELIMINATION

Flood elimination projects run the gamut of a simple sump pump replacement task to the more sophisticated design of a storm water management plan and possibly groundwater infiltration.

During scoping, investigation of flooding condition is sometimes quickly solved by replacing a simplex with a duplex pumps and calling out for cleaning the underground lines. A reliable design approach to solving a persistent back-up in

the sanitary drainage system is to elevate the building drain lines above the plumbing fixtures installed at the lowest level. Sewer ejector pumps, at least two (2), are then employed to convey the sanitary waste to the street sewer. Use of a backwater valve that could potentially help to mitigate a recurring sanitary sewer back up is not a preferred design solution. In the CIP system, the "nodes" will indicate what the intent of the flood elimination project is. Flood elimination can also entail groundwater infiltration problems, and are beyond the scope of a Plumbing and Drainage project.

2. PLAYGROUND REDEVELOPMENT

Playground Redevelopment projects in terms of Plumbing and Drainage involves the scoping of new surface run-off that must be captured due to an impervious area being paved or the repair of an existing site drainage system that is causing ponding or flooding after a rain event. The design plan includes replacement of missing catch basin covers, rodding out catch basins full with sediment or debris, providing additional yard drains to collect storm water due to new pavement on natural or grassy areas, fixing damaged or collapsed underground lines. Also included is making a permanent street sewer connection for surface water run-offs that discharge into overflowing drywells. On site-detention of the storm water is routinely provided by means of a manifold high density polyethylene pipe system. The HDPE pipe, at a minimum, must have 12" in diameter. Concrete tanks, which are an alternative to the HDPE pipe, are acceptable design elements of the storm water management plan if the HPDE pipe system will not work. However, the use of HPDE manhole structures is not acceptable as they do not afford access.

3. HEATING PLANT UPGRADE

A heating plant upgrade automatically brings forth concern about the gas service. The scoping report should mention that a gas load letter for boilers / roof top units and other appliances needs to be forwarded early to the utility company as a first step in ensuring that the gas requirement will be met. In that load letter, a request is also made for firm gas for appliances and interruptible for boilers. Depending if the school is supplied with high pressure or not, a gas boosting system including pump, heat exchanger, flow control module, low pressure switch and regulators are some of the featured elements in the design of the gas system.

The school may not have had gas service and thus the scope report must call for a gas meter room with 3-hr fire rated walls, explosion proof light fixtures and a gas leak detection system. Another alternative is an exterior gas meter assembly in a fenced enclosure, which is the preferred design option as per the latest SCA design requirement. However, acceptance of the location is required from the utility company.

Water supply in Heating Plant Upgrade is also noted in the scope report with an emphasis that a backflow prevention device (RPZ) must be provided.

In many cases, if the boilers normally providing space heating are upgraded, a gas-fired water heater is usually called for in the scope report. If a steam heat exchanger was utilized to generate the domestic hot water, the new design must include a tank and heater assembly for producing the hot water for general purpose and the kitchen area. Hot water mixing valve over a storage tank that may need replacement and insulation over piping are ancillaries to the domestic water heating system that must be addressed.

Duplex sump pumps conveying to the building drains waste water from sump pit that was discharged from the boiler feed water system, condensate tank, steam traps, pressure relief valve and other mechanical equipments, are often replaced in the design of a heating plant upgrade.

4. DOMESTIC PIPING

Domestic piping is the only category where the referred item(s) are primarily of plumbing and drainage in nature. Often, it has to do with lack of water pressure or no water at all to operate plumbing fixtures. The areas of interest noted in the scope report are: piping that may be fitted with valves that no longer function or a domestic water system lacking backflow prevention against cross-contamination or a backflow prevention device that is not on file with DEP and for which a citation had been issued. Other design concerns of the domestic water system include items such as water services for both domestic and fire system, water metering, insulation and quality of the potable water system including sterilization of the domestic water system. Testing may be required to get an understanding of the issue and is preferred to be done during the scoping.

5. ROOF REPLACEMENT

The storm water system is affected in a Roof Replacement project. Complaints about rainwater ponding on a roof may require relocation or provision of additional roof drains. Usually, it is found during scoping field visits that roof drain covers are either missing or damaged or that the gravel stop to prevent ballasts from clogging the drain is missing. Drains are typically to be replaced during roof replacement projects unless they were recently done. Regardless, testing of the drain and piping need to be part of the project and if there is a possibility that leaks in a building are due to cracked pipes or joints, they need to be tested.

For flashing requirements, roof drains and vent stacks are to be relocated if they are too close to a parapet or other roof structure. This distance is typically 12 to 18” if existing. If the item must be relocated, the centerline should be placed 2’-6” minimum from the parapet or roof structure.

6. REHABILITATION OF PHYSICAL EDUCATION FACILITIES

Scoping for rehabilitation projects of Physical Education Facilities covers plumbing and drainage related issues that are associated with a swimming pool. Repairs to a swimming pool are a specialty technical matter requiring assessment and solutions from an expert in the field. Leaky gutters or malfunctions in the filtration or chlorination systems need to be looked into by a knowledgeable pool technician. However, the pool heater is a regular plumbing item, which in many design projects is routinely replaced.

7. SYSTEM REPLACEMENT / TOILET – STUDENT & STAFF

In the project category, system replacement / toilet for student and staff, the focus of the scope report is on the replacement of plumbing fixtures. Accessibility issues triggering the need for barrier free fixtures, floor drain in toilet room with multiple water closets, plumbing stacks and water risers that need relocation following a room conversion are some of the possible design elements in that type of project. These items must be included in the scope and a decision must be made before hand about what is needed. If there are questions, the SCA's FID department is a source for providing input on accessibility issues and what work will require the toilet to become accessible.

8. KITCHEN UPGRADE

Restoration or enlargement of a kitchen usually involves scoping issues dealing with gas, hot water supplies to the kitchen equipments and grease removal from waste water coming from the sinks. The selection of the grease interceptor must conform with DEP sizing guideline outlined in Table I & II of Chapter 19, entitled "Use of the Public Sewers". Other necessary design elements include indirect waste piping and provision of a floor sink receptor. Raising of the water temperature by the use of boosters from 140°F to 180°F is needed for sanitizing and rinsing.

9. SCIENCE LAB UPGRADE

Plumbing and drainage items to be included in the scope report are: acid waste management, gas distribution, master gas control valve, emergency plumbing fixtures and backflow prevention against cross-contamination.

An acid waste neutralization system that is appropriate for all possible scenarios and that is acceptable to the governing agency has been incorporated in SCA Design Requirement 6.1.02.