Instructions:
Upon completion of project construction the following O&M procedures shall take effect and be conducted for a minimum of ten (10) years from the date that implementation was completed.

Each stormwater Best Management Practice (BMP) included in this guidance is defined in the BMP guide sheets found in the City of Chicago Stormwater Ordinance; the particular O&M needs of each BMP are also defined.

The minimum O&M requirements outlined in this document shall be incorporated into the CPS inspection and maintenance regimen and should contain BMP-specific information. If a BMP is installed that is not listed in this guidance document, an O&M specification section must be created.

An inspection and maintenance schedule should be created as part of the O&M plan. This schedule should provide for routine examination of all BMPs and incorporate the varying maintenance needs of each BMP. Each BMP-specific O&M sheet should serve as a checklist for design elements that require inspection, the frequency of inspections, conditions that indicate that maintenance is needed and correlate to the log book. The O&M plan must be signed by the Owner and notarized using the Owner's certification statement found in the regulations. A copy of the O&M plan must be provided to each new owner before the consummation of a sale, and the O&M plan must be signed by the new owner, notarized, and kept on record.

A. General Operations and Maintenance Scope

1. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

a. The owner shall keep an updated log book documenting the performance of the required O&M activities for perpetuity. Log books must be produced upon the request of a city inspector or Space to Grow partner. In general, the log book should note all inspection dates, facility components inspected, and any maintenance performed and repairs made. All inspections and maintenance, both routine and emergency, should be recorded in the log book. The log book shall correlate to the O&M schedule and checklist.
b. Vegetation shall be maintained on a regular basis.
c. Pest control measures shall be implemented to address insects and rodents.
d. Signage and fencing shall be maintained, cleaned and repaired where necessary to protect property and the public.

2. Twice per year: May, Nov

a. Drainage structures and flow restrictor shall be inspected and cleaned semi-annually.
b. Volume control BMPs shall be inspected semi-annually and after significant rainfall events exceeding 1.5 inches.

3. Once per year: Jul (Note: July is recommended here based on less activity occurring at sites during the summer months)

a. O&M plan procedures and practices must be reviewed and assessed annually. Assign specific individuals specific O&M responsibilities for all onsite BMPs.
b. Access routes including roadways and sidewalks shall be inspected annually and maintained as needed.

B. Structure Maintenance

1. Four times per year: Feb, May, Aug, Nov

a. Inspect drainage and stormwater structures including, but not limited to, catch basins, pipes, backflow preventers, flow restrictors, cleanouts, surface cisterns, and subsurface vaults for sedimentation and debris.
b. As needed, use a jetvac system to remove sediment and debris from structures and subsurface vaults when the sediment zone or sedimentation chamber is full as well as from inlet and outlet pipes. Sediments should be tested for toxicants in compliance with applicable disposal requirements, or if indications of pollution are noticed. Maintain a photo record of the chamber and main pipes in a manner so as to view the entire length of the chamber.
c. Floating debris should be removed.
d. Contact CPS Central Office if the chamber, structure or equipment is in need of repair.
e. Structure access and maintenance procedures must meet OSHA confined space entry requirements.

C. Surfaces

1. Synthetic Turf Field

a. Monthly within 1 week of a 1,5" Storm Event: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Volume control BMPs (synthetic turf) shall be inspected after significant rainfall events exceeding 1.5 inches.
ii. Ensure turf is free of sediment.
iii. Monitor field and adjacent area regularly to ensure that the synthetic field drains properly after storms.
iv. Perform surface raking and brushing per manufacturer's warranty requirements.

b. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Inspect turf field
ii. Keep landscaped areas well-maintained and prevent soil, mulch and other debris from being transported onto the turf field.
iii. Ensure turf is free of sediment.
iv. Monitor field and adjacent area regularly to ensure that the synthetic field drains properly after storms.
v. Perform surface raking and brushing per manufacturer's warranty requirements.
vi. Remove chewing gum, weeds, moss, and algae. Remove any mud that has been tracked on to the surface. Ensure products used are acceptable for use on surface.

c. Twice per year: Mar, Sept

i. Perform mechanical aeration of field per manufacturer's instructions.
ii. Groom and clean turf to keep free of sediment.
iii. Clean out inlet structures draining to the subsurface bedding beneath surface and underdrain system.

d. Once per year: Jun

i. Inspect synthetic field for signs of deteriorating or settling.

2. Poured in Place Playground Surfaces

a. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Brush surface to keep clean of moss, leaves, or other litter as needed.
ii. Remove chewing gum, weeds, moss, and algae. Remove any mud that has been tracked on to the surface. Ensure products used are acceptable for use on poured in place surface.
iii. Monitor regularly to ensure that the surface drains properly after storms.

b. Once per year: Jun

i. Annually inspect for signs of deterioration to the surface. Contact poured in place vendor if damaged and requiring repair. Note: warranty covers all defects and items listed below for a period of **(Insert number of years for which surface is warranted)** years from acceptance:
- Reduction in impact attenuation.
- Deterioration of surface, and other, materials beyond normal weathering.
- Separation of surfacing material at changes in finish color or seams.
- Separation of material at border.
- Telegraphing of joints in substrates through finish surface.

3. Permeable Pavement Surfaces

Permeable pavement drainage is achieved through infiltration. As with most stormwater management practices, permeable pavement systems require regular maintenance to ensure a prolonged lifespan. Routine maintenance involves street sweeping, similar to that used on conventional asphalt and concrete paving. The Owner should budget for sweeping permeable pavement twice per year - once in spring and once in fall after buds, leaves, and other tree and landscape debris have fallen for the season. The following requirements and maintenance recommendations for permeable pavement systems must be performed.

a. Winter maintenance: Nov, Dec, Jan, Feb, Mar

i. Do not use sand during winter months as it will clog the openings and lead to the premature need for remedial maintenance. If abrasives are used to provide traction, stone chips should be used rather than sand.
ii. Where/when possible, a rubber or nylon-tipped blade for snow removal activities rather than steel is recommended. Where plowing speeds are low, steel plow blades may be used on pavers with chamfered top edges. The Morton Arboretum in Lisle, Illinois reports that they originally used a rubber tipped plow for their porous unit pavement but later switched to a steel tip with no negative consequences.
iii. Due to the very short flow distance from the permeable paving surface to the point of infiltration, the opportunity for ice formation is greatly reduced. For this reason, regular deicing may not be necessary and is not recommended for water quality reasons.

b. After storms exceeding 1,5" of precipitation: May, Jun, Jul, Aug, Sep

i. Inspect permeable paving surface areas to identify areas of sediment accumulation and evidence of extended periods of ponding (ponding for more than a minute after cessation of heavy rainfall).
- Inspect cleanouts to determine if the underdrain or downstream storm line are clogged as evidenced by standing water in the cleanouts to the elevation of the surface ponding on the permeable paving.
- If no water is standing in the cleanouts, the permeable paving surface is clogged. Address the clogged surface as described under remedial maintenance.

ii. To maintain the infiltration capacity of the system, the permeable paving should be inspected twice annually 24-48 hours after a large rain event for clogged openings in the pavement as evidenced by ponding within the pavement's openings or standing water on the paving surface.
iii. Areas that exhibit ponded water on the surface will require remedial maintenance. Remediation can be achieved using a vacuum sweeper with water jets, sweeper, and vacuum bar attachment to evacuate sediment and joint material. Evacuated joint material can be washed and replaced, or new joint material can be used to refill the joints.

c. Every 4 weeks During Growing Season: Apr, May, Jun, Jul, Aug, Sep, Oct

i. Keep landscaped areas well-maintained and prevent soil, mulch and debris from being transported onto the pavement.
ii. Weed edges of permeable paving near mown lawn areas.
- Do not blow or discharge grass clippings onto the pavers
- If grass begins to grow in the openings, it should be easy to hand remove provided that the sprouts are pulled early.
- Because weeding will be difficult where roots have been allowed to grow, inspecting and pulling grass sprouts from the permeable pavement should be incorporated into the weekly lawn mowing routine surrounding the pavement system.

iii. Remove vegetation established in gravel spaces in pavement.
iv. Monitor regularly to ensure that the paving surface drains properly after storms.
v. Ensure that surface is free of sediment.
vi. Provide new joint material or use displaced joint material to refill the joint spaces between pavers.

d. Twice per year: Apr, Aug

i. Mechanically sweep pavement surface with either high-efficiency vacuum sweepers or broom sweepers.
- High-efficiency vacuum sweepers are more effective at capturing and removing fine sediment. When vacuum equipment is used, vacuum settings should be adjusted to prevent uptake of aggregate from the porous unit paving openings and joints.

ii. However, mechanical sweeper equipment is able to dislodge surface encrusted sediment that typically clogs permeable pavement systems. When mechanical sweepers are used, permeable paving surface should be dry-swept (water should be turned off) in dry weather to remove encrusted sediment that appears as small, curled "potato chips" in the joints between pavers. Clean out inlet structures within or draining to the subsurface bedding beneath surface.

e. Once per year: Jun

i. Inspect surface for signs of deterioration or settling.
ii. Inspect void areas and replace or add joint material.

4. Textured Acrylic Surfaces

a. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Clean leaves, dust, dirt and remove from surface using soft nylon type or waterbroom with less than 70 pounds per square inch (psi)
ii. Inspect surfaces and clean spillage and soiling as needed using procedures recommended by manufacturer.
iii. Remove chewing gum, weeds, moss, and algae. Remove any mud that has been tracked on to the surface. Ensure products used are acceptable for use on the surface.

b. Once per year: Apr

i. Perform annual spring inspection on all surfaces:
- Repair surfaces as needed following standard patching and resurfacing procedures as recommended by product manufacturer and applied by appropriate vendor or installer.
- Seal cracks with sealant in appropriate color scheme to prevent further damage to adjacent textured acrylic surfaces as recommended by product manufacturer and applied by appropriate vendor or installer.

5. Asphalt Pavement Markings

a. Twice per year: Mar, Sep

i. Inspect surfaces and clean spillage and soiling as needed using procedures recommended by manufacturer.

6. Site furnishings and Playground Equipment

a. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Inspect site furnishings and playground equipment for graffiti and clean surfaces per manufacturer's instructions.

b. Twice per year: Mar, Aug

i. Inspect surfaces and clean spillage and soiling as needed using procedures recommended by manufacturer.
ii. Inspect surfaces for abrasion, scratching, or coating failure. Apply paint and/or coating following manufacturer's instructions and colors.
iii. Inspect for loose fittings and surface mountings and ensure bolts are tight. Follow manufacturer's instructions for proper equipment and processes.

D. Irrigation Systems

1. Three times per year: Apr, Jun, Aug

a. Periodically check the irrigation controls and system heads at least three times annually.
b. Check the system for operation, leaks, or other problems.

2. Spring Start Up: Apr

a. Start up system in the spring.

3. Fall Shut Down: Nov

a. Shut down system in the fall. Blow and bleed all lines and shut off all valves and connections at source.

E. Landscape

1. Rain Gardens, Vegetated Swales, Bioretention Areas and Detention Systems

Properly designed and installed rain gardens, swales, bioinfiltration and detention systems require maintenance similar to traditionally landscaped areas after a successful establishment period, typically three years. During periods of extended drought, these systems may require watering approximately every 10 days. See Plant Maintenance and Tree Care sections herein for other plant based maintenance requirements.

a. Monthly During Growing Season: Apr, May, Jun, Jul, Aug, Sep, Oct

i. Identify the source of ponding when extended periods of ponding greater than 48 hours occur within the bioretention area.
- Inspect cleanouts to determine if the underdrain or downstream storm line are clogged as evidenced by standing water in the cleanouts to the elevation of the surface ponding in the bioretention area.
- If no water is standing in the cleanouts, the bioretention surface is clogged. The clogged soil should be remediated by removing the top one to two inches of bioretention soil until the area drains. Removed soil should be replaced in November after the growing season ends. Replacement bioretention soil must meet project specifications.

ii. Mow and trim vegetation to ensure safety, aesthetics, proper swale operation, and to suppress weeds and invasive vegetation; mow only when swale is dry to avoid rutting.
iii. Re-seed and/or replant bare areas in accordance with project plans and specifications; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
iv. Re-mulch void areas.
v. Plant alternative grass species in the event of unsuccessful establishment or bare areas measuring larger than 2 feet by 2 feet (9 square feet (SF)).
vi. Remove, as needed, matted organic debris such as large leaves and other layered matter that prevents transmission of water into the soil.
vii. Rake accumulated sediment from the rain garden, swale or bioretention surface, taking care to protect plants. Minor accumulations may be raked into the soil.
viii. Remove litter and debris.
ix. Inspect and clear obstructions inlet and outlet pipes as needed.

b. Twice per year: May, Aug

b. Inspect areas to identify accumulation of sediment and matted organic debris that could seal the surface as well as extended duration of ponding (ponding for more than 24 hours after cessation of rain). Inspections should be conducted semi-annually and after rainfall events exceeding 1.5".
ii. Inspect trees, shrubs and plants to evaluate health.

c. Once per year: Aug

i. Inspect and correct erosion problems, damage to vegetation, sediment and debris accumulation, and pools of standing water.
ii. Inspect for uniformity in cross-section and longitudinal slope, correct as needed.
iii. Inspect facility and pretreatment areas for erosion, vegetative conditions, etc.

2. Plant Maintenance

Basic maintenance services should include the maintenance of trees, shrubs and ornamental perennials to maintain the property by the owner. The schedule for maintenance activities should be designed to promote the healthy growth and enhance the natural beauty of these areas and will include mowing, weed control, pest management, mulching, pruning, watering and fertilization to ensure healthy, vigorous plant growth. Like any garden, weeding will be one of the most important tasks to maintaining the planting areas. It will be important for those weeding these areas to be familiar with the appearance of each plant used in the design in all stages of growth. As the plants flower and release seed they may begin to grow in new locations. Comparing the location of the plants observed in the planting areas with the planting plans will be a valuable aid in learning their identification.

a. Weekly During Growing Season: Apr, May, Jun, Jul, Aug, Sep, Oct

i. Water plants 2 to 3 times per week during first growing season.
ii. Water plants during dry periods after first growing season.
iii. Weed vigorously during the first 3 years after installation while plants establish and until they can out-compete weeds.

b. Monthly During Growing Season: Apr, May, Jun, Jul, Aug, Sep, Oct

i. Weeds should be removed before they are allowed to set seed. Hand-pull weeds, taking care to remove the entire root mass and shake any loose soil back into the planting bed is preferred. If herbicide applications are used, care should be taken to avoid contact with non-weed plants.
- It is easiest to pull weeds when the soil is soft after a rain.
- At a minimum, the flowers of these undesirable species should be cut and removed before they set seed.
- As the plantings mature they should become more robust and the unwanted weeds should be reduced.
- Weeding the perennial beds will take approximately 90 minutes for every 1,000 square feet of planting (using a push hoe). The weeding should be done 3 to 4 times between April and mid-June and on an as-needed basis between mid-June to Nov.
- When uncertain about whether a plant is a weed, it may be helpful to let it grow for a period of time. As the leaves mature it will be easier to match it to the plants that were planted deliberately as part of the design. It may be helpful to maintain a weed identification picture of the weeds that are commonly found, as well as a Space to Grow plant identification chart for all perennials meant to be in the gardens.
- Iowa state university is a good source for weed identification resources. See http://www.weeds.iastate.edu/mgmt/qtr97-1/weedid.htm.

ii. Pest management: integrated pest management (IPM) procedures should be followed to control insects and diseases within shrub and ornamental perennial plant beds. IPM methods shall include establishing action thresholds for certain diseases/pests, monitoring disease/pest levels, developing prevention strategies, and identifying control strategies. Control methods may include mechanical removal (trapping), or highly targeted chemical treatments, such as pheromone applications. Broadcast spraying of non-selective pesticides should be avoided and used only as a last resort.

c. Once per Year Spring Clean-up: Apr

i. The spring clean-up should be performed to remove accumulated winter debris from plant beds, and pavement areas.
ii. Clean up should include cutting back ornamental grasses and flower stalks from herbaceous plants from the previous season's growth. Clean up should be completed by April 30 each year.
iii. Spring clean should include the removal of winter protection devices such as tree wrapping and burlap snow fence.
iv. Tree Staking: Inspect installed tree staking or remove tree staking for young trees. Note: trees should not be staked for more than 1 total calendar year.
v. When fertiiizing is required: shrubs, groundcover, and perennials in plant beds should be fertilized in the spring. Fertilizer shall be of a 1:1:1 ratio, should consist of at least 50% slow release nitrogen, should be acidic in soil reaction, and should be applied at a rate of three pounds of nitrogen per 1000 SF.

d. Once per year Fall Cleanup: Nov

i. Remove leaves, branches and spent plant material from plant and cobble bed areas. Winter protection measures as required herein shall also be installed.
ii. Cut back non-hardy woody shrubs that incur frequent die-back of stems over the winter should be pruned back to within 6 to 12 inches from the ground each. This includes plants in the following genuses: Rosa, Spirea, Potentilla and Diervilla.
iii. All ornamental grasses and certain late-flowering ornamental perennials with decorative seed heads, such as Aster, Echinacea, Rudbeckia, etc. should be allowed to keep their spent foliage and flower heads through the winter. Mulching: partially decomposed leaf mulch should be applied in a 2 inch layer to all bare areas in May of each year.
iv. Tree Staking: Inspect installed tree staking or install tree staking for young trees
- Temporary staking should be provided to young trees that are vulnerable to wind damage.
- Staking methods should include the use of adjustable, flexible tree loops made of plastic, or rubber. Rope and wire can be used as tie-downs, but should not be in contact with the tree.
- Once trees are established the staking should be removed.

3. Tree Care

Basic maintenance services should include the maintenance of trees and shrubs. The schedule for maintenance activities should be designed to promote the healthy growth and enhance the natural beauty of these areas and will include pruning, mulching, staking, pest management, and winter protection and repair measures to ensure healthy, vigorous plant growth.

a. Monthly: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

i. Inspect trees to remove any torn and hanging branches. Branches should be pruned off with sharp hand saws or loppers.
ii. Inspect for diseased wood and prune as soon as it is observed. To avoid exposure to oak wilt disease, oak trees (all varieties) should only be pruned when they plants are dormant (between November and March).
iii. Pest management
- Integrated pest management (IPM) procedures should be followed to control insects and diseases on trees and large shrubs. IPM methods shall include establishing action thresholds for certain diseases/pests, monitoring disease/pest levels, developing prevention strategies, and identifying control strategies. Control methods may include mechanical removal (trapping), or highly targeted chemical treatments, such as pheromone applications.
- Broadcast spraying of non-selective pesticides should be avoided and used only as a last resort.

a. Once per year: Dec

i. Pruning: pruning should be primarily performed during the winter season between December 1st and March 1st when plants are dormant. Pruning should be performed to remove diseased or damaged wood and to maintain general form and habit. Any pruning equipment used to remove diseased wood should be cleaned with a bleach solution before using it on other plants, or non-diseased wood from the same plant. All debris from pruning activities shall be removed and disposed of off-site. Service personnel should take care to sweep walks and drives after activities are completed. Pruning should include the following:
- Removal of diseased or damaged wood.
- Removal of sucker growths at the base of trees.
- Removal of water sprouts from dormant or adventitious buds on the trunks or main branches of trees.

ii. Removal of forked or competing leaders on smaller trees. Winter protection and repair methods: commercial-grade tree wraps should be installed on all young trees that are susceptible to sun scald in the winter. This includes plants of the following genuses: Prunus, Malus, Gleditsia, Tilia, Acer, and Platanus.
- Tree wraps shall be installed during the fall cleanup in November and removed during the spring cleanup in April.
- Any sun scald damage occurring to the outer bark of young trees should be removed with a sharp clean knife.

Chicago Public Schools
DEPARTMENT OF FACILITIES
CAPITAL IMPROVEMENT PROGRAM

ARCHITECT OF RECORD INFORMATION
UrbanWorks
213 W. INSTITUTE PLACE
SUITE 710
CHICAGO, ILLINOIS 60610
T: 312.202.1200
F: 312.202.1202

LANDSCAPE/CIVIL AND STORMWATER ENGINEER
Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
8755 W. HIGGINS ROAD
SUITE 835
CHICAGO, ILLINOIS 60630
T: 773.693.9200

NATHAN S. DAVIS
ELEMENTARY SCHOOL
3014 W. 39TH PL
CHICAGO, ILLINOIS 60632

PROJECT NO.

NO. REVISIONS

	DATE	DESCRIPTION
-	XX.XX.XXXX	XX

DRAWN BY: KSS
SCALE: SEE PLANS
JOB:
FILE:

IN PROGRESS
NOT FOR CONSTRUCTION

NORTH
KEY PLAN

SHEET TITLE

OPERATION AND MAINTENANCE PLAN I

DRAWING NO.

C3.1