The Shopps at 88th Subdivision Monitoring and Management Plan

Section 1.0 Near-term monitoring and reporting

1.1 RESPONSIBLE PARTIES

Orland 88 LLC (the developer) will be responsible for funding and implementing a five-year "near-term" management and maintenance plan for establishing a naturalized landscape associated with the proposed Shopps at 88th Commercial project stormwater facility located at the southeast corner of 159th and 88th. The developer may elect to contract management and maintenance services to a third party to ensure proper implementation.

1.2 MONITORING METHODOLOGY

Areas of naturalized revegetation will be monitored following methodologies as outlined herein. Meander survey monitoring will be performed on an annual basis for five years after planting is substantially complete, or until the landscape is accepted by the Village. Annual vegetation monitoring will occur in August, September, or early October. Meander survey methodology will involve taking five to 10 representative site photographs and performing a review of at least 20 percent of each vegetative community to identify the following:

- a. the limits of all vegetation areas by general community type and dominant species within each planting zone (e.g., wetland and prairie zones),
- b. all plant species (native and non-native) in each planting zone,
- c. the approximate percent ground cover by native species within each planting zone,
- d. the percent ground cover by non-native or invasive species in each planting zone,
- e. erosion and sedimentation problems,
- f. water level or drainage problems,
- g. areas of bare soil larger than one square-meter, and
- Observations on specific management strategies necessary to achieve acceptance requirements.

1.3 REPORTING REQUIREMENTS

The developer will provide the Village with notification 24-hours prior to the start of planting installation. Following substantial completion, the developer will document that natural area landscape revegetation has been completed. Nursery packing lists indicating the species and quantities of materials installed will accompany this notice.

In addition, the developer (or their designated representative) will submit an annual monitoring report to the Village of Orland Park by February 28th of the following year evaluating the progress of the naturalized landscape toward design goals. The report will contain a location map, a summary of annual monitoring observations, a description of management performed during the year, a tabular summary of annual progress relative to acceptance standards, and a list of recommendations for management during the upcoming year.

1.4 ACCEPTANCE REQUIREMENTS

Satisfactory landscape development associated with naturalized vegetation in the stormwater facility will be based on the following items. The attainment of these items is expected to result in acceptance of the landscape improvement by the Village of Orland Park.

- Within three months of seed installation (or three months after the start of the growing season following dormant seeding), at least 90 percent of the seeded area, as measured by aerial cover, will be vegetated or otherwise stabilized against erosion.
- Naturalized landscapes shall have more than one square-meter devoid of vegetation, as measured by aerial coverage
- Seeded areas shall have no rills or gullies greater than four inches wide by four inches deep, and basin shorelines shall not have more than six inches of cut as a result of erosion.
- Areas seeded to turfgrass or low-maintenance turf shall have 95 percent ground cover.
- Emergent areas shall have minimum of 35 percent ground cover (avg. 50 percent) and other wetland and prairie areas shall have a minimum of 35 percent ground cover (avg. 60 percent) by species in the approved plant list and/or native species with native coefficient of conservation (C-) values 32 (per Swink and Wilhelm 1994 or more current version).
- Naturalized landscapes shall have a minimum of 30 percent presence by species seeded or planted for the permanent matrix and/or native species with C-value ∃2 (per Swink and Wilhelm 1994 or more current version).
- Installed woody materials shall be alive, in healthy condition, and representative of the species.
- No more than 25 percent of any specific plant community shall be individually or collectively dominated by non-native or weedy species.
- None of the three-most dominant species may be non-native or weedy, including but not limited to Canada thistle (*Cirsium arvense*), common reed (*Phragmites australis*), reed canarygrass (*Phalaris arundinacea*), sweetclover (*Melilotus* spp.), Kentucky bluegrass (*Poa pratensis*), purple loosestrife (*Lythrum salicaria*), barnyard grass (*Echinochloa crus-galli*) or sandbar willow (*Salix interior*) unless otherwise indicated on the approved planting plan.
- Cattails (*Typha* spp.) do not count towards the 25 percent weed criterion provided they represent no more than 20 percent cover.

Although not acceptance requirements, the following milestones will be assessed for Year 2 natural landscape development to help determine the need for and level of management appropriate to achieve Year 3 landscape acceptance:

• Minimum ground cover of 25 percent by species in the approved plant list and/or native species with C-value greater than or equal to 2.

• Minimum presence of 20 percent by species seeded or planted for the permanent matrix and/or native species with C-value greater than or equal to 2.

Section 2.0 Near-term management for naturalized landscapes

Near-term (i.e., five-year) management for naturalized landscapes associated with the Shopps at 88th Commercial development will involve monitoring and management to promote germination and establishment of desired plants. The following is a near-term maintenance plan for naturalized landscapes associated with the development.

2.1 NEAR-TERM MANAGEMENT TASKS

For several years after installation, naturalized landscapes will be managed on a regular basis to ensure successful establishment. Site characteristics influence how management and maintenance techniques are implemented. Vegetation management actions may differ from the tasks and frequencies indicated below based on specific recommendations from a Village-approved native landscape restoration specialist.

2.1.1 Undesirable Plant Control

The developer acknowledges that it is best to perform corrective actions for vegetation management early in the revegetation effort. Aggressive and/or non-native species will be managed such that their presence and density does not threaten the attainment of acceptance requirements.

Depending on the type of plant being targeted, control of undesirable plant species may involve removing all above-ground and below-ground stems, roots, and flower masses prior to development of seeds. Weeding practices will avoid damaging the native plantings and be timed to prevent development of weed seeds. The ability to differentiate between weeds and native seedlings is important. Plants may be left untreated until they can be positively identified.

Various means of weed control will be employed, as appropriate, and may include mechanical control, chemical control, and/or biological control.

Mechanical Control: Mechanical control of nuisance plant species typically includes cutting, mowing and/or the digging up individual plants by hand. In many cases, cutting or mowing a plant before its seeds mature will minimize further spread. Cutting or mowing close to the ground surface with a weed-eater or hand-scythe can be an effective means of control for species such as sweet clover, various thistles, and ragweed. For general mowing of swaths of vegetation, mowers will be set to a height of 12+ inches above the ground surface or to a height that treats weedy species yet minimizes impacts on desirable plants.

For species such as common reed, purple loosestrife, Canada thistle, and reed canarygrass, mowing actually encourages the spread of underground stems. Hand digging these species and woody undesirables such as multiflora rose can result in control if there are fewer than 100 plants throughout the entire site. Where more than 100

individuals of such plants are present, chemical control will be the primary method of control. (Note: Pulling and digging out weeds generally is discouraged because the soil disturbance can uproot desirable plants and encourage the growth of more weeds.)

Chemical Control: When employed in conjunction with prescribed burning and mechanical control, the judicious use of herbicides can be an important component of management programs for controlling weeds. Some weeds such as purple loosestrife, buckthorn (*Rhamnus* spp.) and honeysuckle (*Lonicera* spp.), reed canarygrass, common reed, sandbar willow, and cattails are controlled more effectively by chemical treatment than by most mechanical control measures.

For aggressive weeds, an appropriate herbicide will be applied. Because of the potential for damage to native plant communities, the use of preventative herbicides will be limited to problem areas and problem species for which manual control is ineffective. Aquatic herbicides will not be used to treat algal blooms.

Glyphosate herbicide (trade names Rodeo or Roundup) is often recommended for use in naturalized landscape areas. Other herbicides such as Transline, Plateau, and Garlon are also used. The application of herbicides will be performed only by persons licensed or certified in the State of Illinois for pesticide/herbicide application. Herbicide use will be in strict compliance with all application rates, procedures, warning labels and applicable codes, standards and best management practices.

Generally, wick application will be preferred over spray application, which is less selective. Wicking applies herbicide only to individual plants, using a canvas-covered, perforated, chemical filled PVC pipe. Trained personnel walk the area, swinging the eight foot pipe from side to side above the native plants but deliberately striking invasive species. The pipe strikes and bends the weeds, smearing them with the chemical and destroying them within a few days. If used, spray applications will not occur on gusty days because non-target species could be affected.

Biological Control: An alternative to chemical treatment, use of biological controls for purple loosestrife will be considered provided site conditions are appropriate to support and maintain the insect population. Through this method, host-specific insects (one a root infesting weevil; others are leaf-eating chrysomelid beetles) are released to feed on the roots or leaves of purple loosestrife. If purple loosestrife becomes abundant, biological control can prove a cost-effective means of management.

2.1.2 Wildlife Management.

It is generally accepted that the long-term use of even the most benign pesticides has effects on wildlife that are still only barely researched. Therefore, pesticides will not be used broadly or routinely at the mitigation site other than for mosquito abatement (should that be necessary). Pesticides will be used only for specific and localized problem areas as determined by a native landscape restoration specialist with experience in installation and development of native plant communities, should such areas occur. Standard application procedures and precautions for chemical application in wetland areas will be followed.

Control of nuisance species such as geese and ducks, which often forage on young emergent wetland plants, may be performed if monitoring indicates such species are responsible for poor plant establishment and performance. The method will be determined by a native landscape restoration specialist.

2.1.3 Debris Management

Debris (e.g., paper, plastic, metal, concrete, etc.) will be removed from the developed area every other month between March and November. Debris will be disposed of at an appropriate off-site trash receptacle or hauled to an approved dump site.

2.1.4 Fertilizer Application

For ecological reasons, a conservative approach to the application of fertilizers will be taken. Turf management chemicals will not be used within areas of naturalized plantings unless specifically prescribed by and per the direction of a native landscape restoration specialist. If used, special care will be taken to not apply fertilizers when inclement weather is forecast.

2.2 SCHEDULE OF NEAR-TERM MANAGEMENT ACTIVITIES

Table 1 and the following text provide a general schedule of management and maintenance tasks for installation and establishment of naturalized landscapes. The actual schedule and tasks performed in any given year may differ from those indicated based on specific recommendations from a natural landscape restoration specialist.

2.2.1 Typical First-Year Management Actions

To prevent weed seed development, mowing to a height of 6 inches will be performed when vegetation reaches a height of 12 inches. (Note: Weekly mowing at turf lawn height will NOT be performed, as mowing too often can set-back native planting development.) A rotary or flail-type mower will be used to finely chop the cut material. If clippings shade the ground or smother the remaining plants, they will be bagged for off-site disposal or otherwise dispersed. The last mow will be timed so that vegetation can grow to a height of eight to 10 inches before winter.

Weeding practices will avoid damaging the native plantings and be timed to prevent development of weed seeds. For aggressive weeds, herbicide will be selectively applied (e.g., wick application, not spraying). Turf management chemicals will not be used on native plantings except as directed by a Village-approved landscape restoration specialist.

Debris and litter (e.g., paper, plastic, metal, concrete, grass clippings, brush, etc.) will be removed every other month between 1 March to 31 October to prevent floating materials from clogging the outlet. Debris will be disposed of at an appropriate off-site trash receptacle.

Other potential responsibilities may include, but are not limited to, access restriction enforcement, insect/pest control, erosion repairs, and wildlife management (e.g., control of carp, muskrats, geese, etc. as needed). The need for other management actions will be determined on a quarterly basis when performing general maintenance visits for dam embankments and control structures.

2.2.2 Typical Second-Year Management Actions

During the second growing season, the seeded area will be mowed as close to the ground as possible in early spring and the cuttings raked or bagged. If annual weeds remain a problem, an additional mow will be performed during mid- to late June, with the mow height set to 12 inches.

Weed management will emphasize control of biennial and perennial weeds. Biennial weeds targeted for control include sweetclovers (*Melilotus* spp), Queen Anne's lace (*Daucus carota*), and teasel (*Dipsacus* spp.). Proper weed control may require multiple treatments and will be performed at times that will provide maximum treatment effectiveness.

Other management practices will include debris and litter removal, access restriction enforcement, and erosion control and repairs (as needed). Additional management tasks may include insect/pest control, reseeding/replanting in targeted areas, wildhip management as determined on a quarterly basis. If there is sufficient fuel, a prescribed burn may be attempted at the end of the second growing season, provided proper permits from the Illinois Environmental Protection Agency are obtained and notice is provided to the Village and local authorities.

2.2.3 Typical Third-Through Fifth Year Management Actions

Typical management in the third growing season will involve the use of prescribed fire in combination with mechanical and chemical methods for controlling aggressive biennial and perennial weeds.

A permit will be obtained from the Illinois Environmental Protection Agency prior to conducting a prescribed burn. The burn will occur between mid-October and April as weather and site conditions permit. Prior to conducting a prescribed burn, notice must be provided to the Village and local authorities. If prescribed burning is not practical, mowing in late fall or very early spring will be substituted for burning. The burn-replacement mow will be done at a height of two inches, with cut material bagged for off-site disposal.

As in the first two years, management of aggressive weeds will continue. Other management practices will include debris and litter removal, access restriction enforcement, and erosion control and repairs (as needed). Additional management tasks may include insect/pest control, reseeding/replanting in targeted areas, wildlife management as determined on a quarterly basis when performing general maintenance visits for dam embankments and control structures.

Section 3.0 Long-term management for naturalized landscapes

Traditional turfgrass maintenance practices are not appropriate for naturalized landscapes. Proper management is essential and will be performed by parties experienced in native landscape maintenance.

3.1 CONTACT INFORMATION

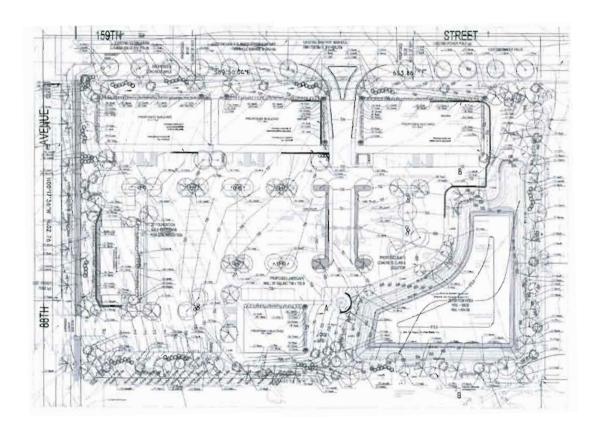
Orland 88 LLC, or an authorized representative, will be responsible for the timely execution of all long-term maintenance activities within the naturalized landscape. The following party should be contacted regarding management activities:

Names, addresses, contacts, and telephone numbers of the property owner(s): Orland 88 LLC 707 Skokie Boulevard Suite 210 Forthbrook, IL 60062

Names, addresses, contacts, and telephone numbers of the party or parties legally responsible for operations and maintenance:

Orland 88 LLC 707 Skokie Boulevard Suite 210 Northbrook, IL 60062 Phone: (847) 509-3600

3.2 LOCATION INFORMATION



3.3 PROHIBITED ACTIVITIES

This section outlines various activities restricted or prohibited within areas of naturalized landscaping except as needed to achieve and maintain a naturalized landscape consistent with the approved plan as directed by a natural landscape maintenance specialist:

- · dumping of yard waste or debris
- · replacement of approved vegetation with non-approved materials
- · construction or placement of structures
- · application of pesticides fertilizer, or herbicides
- · mowing other than for meeting specific management goals
- commercial, industrial, agricultural, residential developments, buildings, or structures, including but not limited to signs, billboards, other advertising material, or other structures
- removal or destruction of trees or plants, mowing, draining, plowing, mining, removal of topsoil, sand, rock, gravel, minerals or other material
- operation of snowmobiles, dune buggies, motorcycles, all-terrain vehicles or any other types of motorized vehicles.

Village approval will be obtained for any amendments that alter the site beyond the approved design condition. The land use restrictions may be changed, modified or revoked only upon written approval of the Village of Orland Park.

3.4 LONG-TERM MANAGEMENT TASKS

Long-term maintenance of naturalized landscapes involves significantly less effort and cost than for landscapes vegetated with traditional turfgrass. Routine maintenance activities for naturalized landscapes include debris management, structural inspections, vegetation maintenance, and pest species management. Non-routine maintenance and management actions are performed as site-specific conditions warrant and include sediment/pollutant removal, structure replacement, and replanting

3.4.1 Debris and Litter Management

Debris and litter (e.g., paper, plastic, metal, concrete, grass clippings, brush, etc.) will be removed be removed every other month between 1 March to 31 October and disposed of at an appropriate off-site trash receptacle.

3.4.2 Structural Management

Water control structures will be inspected quarterly and within 24 hours of each major rainstorm (>1 inch rainfall). Inspections will include an evaluation on the stability of the outlet, embankments, and inlets. Observations will be made on the presence and extent of erosion, lack of vegetation, or other problems such as soil cracking, the outlet/inlet structure degradation, sink holes, or wet areas on the slopes. An engineer will perform or participate in these inspections.

Capture of sediment and pollutants eventually results in a decrease in pool volume and/or water quality in a stormwater facility and sediments need to be removed. Because each facility is different, there are no set timeframes for sediment/pollutant removal. The need for sediment removal is expected when the pool volume is reduced by 15 to 20 percent of the design volume.

3.4.3 Vegetation Management

Long-term management actions emphasize regular prescribed burning, accompanied by periodic herbicide treatment, mowing, or a combination of these practices. Accurate plant identification is essential. The type of vegetation management will be based on recommendations from a native landscape restoration specialist.

Prescribed Burning: Established naturalized landscapes will be burned every two to three years or as directed by a landscape restoration specialist/ecologist. Large areas will be divided into management sections and burned on a rotational basis, with only a portion burned each year and the entire area burned over a three period. The timing of the burn will be determined based on weather conditions and management goals as recommended by the landscape restoration specialist/ecologist.

Burning is to be conducted by a qualified burn contractor experienced in grassland fire control and only upon receipt of a permit from the Illinois Environmental Protection Agency. In addition, permission is needed from local authorities, including the Village.

Weed Management: Aggressive plants can overtake naturalized landscapes in the absence of management intervention. The "worst offenders" typically include purple loosestrife (Lythrum salicaria), cattails (Typha spp.), bush honeysuckles (Lonicera spp.), buckthorn (Rhamnus spp.), multiflora rose (Rosa multiflora), black locust (Robinia pseudoacacia), teasel (Dipsacus spp.), garlic mustard (Alliaria petiolata), wild parsnip (Pastinaca sativa), thistles (Cirsium and Carduus spp.), common reed (Phragmites australis), and reed canarygrass (Phalaris arundinacea).

Mechanical, chemical, or biological control of these and other aggressive weeds will be performed as directed by the native landscape restoration specialist.

Mechanical Control — Mechanical control of nuisance plant species typically includes mowing and/or the digging up individual plants by hand.

The timing and height of the mow depends on the species being controlled but typically is between 12 to 18 inches high. A rotary or flail mower will be used to chop the cut material into fine pieces that will not smother native plants

Hand pulling or digging of these species and woody undesirables can provide control if there are fewer than 100 plants.

Chemical Control — Use of preventative herbicides will be limited to selected problem areas with a dominance of plant species that do not respond well to prescribed burning and/or mechanical control measures.

Herbicide application is to be performed by a licensed professional applicator in strict compliance with all warning labels and applicable codes, standards and best management practices.

Herbicides will be applied selectively (e.g., wick application rather than spraying).

Biological Control — Special attention will also be given to purple loosestrife control, should it occur on the site. Where the plant is abundant, biological control can prove a cost-effective means of management. Through this method, host-specific insects are released to feed on the roots or leaves of purple loosestrife.

Supplemental Planting/Revegetation: Remedial actions may be needed as site conditions warrant. Such actions may include spot reseeding. Installation of supplemental plugs and/or seed using species in the approved mix (or as modified based on coordination with the Village) will be performed under any of the following circumstances: 1) more than half of the area of emergent plantings does not establish or persist; 2) the slope has any area greater than 0.25 square-meter in size devoid of vegetation; 3) the shoreline has any area more than five feet in length devoid of vegetation; or 4) any area (regardless of size) is actively eroding.

Except for the cover crop, seed from native species will be used, with an emphasis on establishment of the grass matrix, which will support prescribed burn management. The type and quantity of seeds will be determined based on site-specific conditions by a native landscape management specialist. A cover crop will be used when seeding bare areas, with seed oats comprising the primary cover crop species. If used, annual ryegrass will be applied at a rate not to exceed 5 lbs/ac.

If desired, a showy annual wildflower mix may be periodically seeded into the naturalized landscape to increase the color and coverage by wildflowers.

3.4.4 Pesticide and Fungicide Use

Pesticides will not be used broadly or routinely. Instead, pesticide use will be performed at specific and localized problem areas. Particular care will be exercised in the areas near or directly tributary to surface waters. Standard application procedures and precautions will be followed.

Insecticides and fungicides are generally unnecessary. If public perception or the identification of a specific mosquito problem warrants the use of insect controls, biological measures will be considered. This could include stocking a wet basin with fish that feed on mosquito larvae and/or the use of BTI (*Bacillus thuringiensis israelensis*) to selectively kill mosquito larvae. (Iabitat structures also could be installed to encourage the nesting and feeding of tree swallows, purple martins, bats, or other insectivorous wildlife.

3.4.5 Fertilizer Use

For ecological reasons, turf management chemicals will <u>not</u> be used on naturalized plantings except as directed by a native landscape restoration specialist.

3.4.6 Other Management Actions

Other potential responsibilities could include, but are not limited to, access restriction enforcement and wildlife management (e.g., including control of carp, muskrats, and geese). The need for other management actions will be determined when performing other maintenance visits.

On a periodic basis, the fees collected to cover maintenance costs will be reevaluated and updated, contracts with contractors will be renewed, and contact information will be updated in the project files.

3.4.7 Estimated Annual Costs for Long-Term Management.

Regular maintenance program work execution will lead to less frequent and less costly long-term maintenance and repair, possibly requiring replacement. The business association, Orland 88 LLC, will establish source(s) of funding for continued inspection, operation, maintenance, and repair of the naturalized stormwater basin facility. Funds may be secured by such means as regular periodic assessments, special assessments, and loans and will be earmarked separately from general site maintenance funds. Budget considerations for the naturalized basin should include annual maintenance expenses, a cushion for unexpected expenditures, and a contribution to a reserve fund (to cover non-routine expenses).

The estimated annual cost for long-term management, including routine maintenance expenses such as debris/litter management, structural management, and weed control, is \$2,400 (in 2009 dollars). Should supplemental planting or prescribed burning be implemented, an additional \$2,200 of expenses is anticipated for the annual budget. Non-routine expenses such as removal of sediment when more than 50 percent of the volume below NWL has been lost (or as otherwise determined) and substantial replanting following die-off of more than 50 percent of the vegetation in any zone should be determined by requesting cost proposals from qualified contractors. The following table summarizes anticipated long-term management costs. The indicated long-term maintenance provisions may need to be adjusted based on experience recorded over the initial period of establishment.

Tasks to be Completed Annually	Unit	No. Units	Unit	Cost	Total Co	ost
Debris and Litter Management	Each	2	5	500.00	S	1,000.00
Structural Management	Each	2	S	200.00	\$	400.00
Weed Control	Each	1	S	1,000.00	\$	1,000.00
Subtotal Annual Management Activities					\$	2,400.00
Tasks to be Completed Every Three Years	Unit	No. Units	Unit	Cost	Total Co	ost
Prescribed Burn	Each	1	\$	1,000.00	S	1,000.00
Supplemental Planting/Seeding (if necessary)	Acre	0.4	\$	3,000.00	5	1,200.00
Subtotal for 3-Year Management Activities					\$	2,200.00
Average Annual Cost for Long-Term M&	M		-		\$	3,133.33

Note: Values reflect 2009 dollars.

Table 1. Near-term Management & Maintenance Tasks for Naturalized Landscapes.

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