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NATIVE LANDSCAPE PLAN SPECIFICATIONS (4.18.08)

1.0 INTRODUCTION

The purpose of this plan is to establish native plant communities within stormwater management facilities at the Doctor East residential development. The areas to be planted consist of 5 compensatory storage areas identified as Comp Areas #1-5 on sheets 1 and 2. Comp Areas 4 and 5 will function as stormwater detention as well as compensatory storage.

2.0 CONTRACTOR QUALIFICATIONS

The Native Landscape Contractor chosen for the establishment and enhancement of the natural areas must be experienced in the restoration, installation, and management of said areas. They must have a minimum of five years experience in the field. There shall be a supervisor available at all times that can identify non-native and native plants by genus and species. The goal of installing successful native plant communities is a long-term process. Therefore, it is imperative that a qualified Native Landscape Contractor perform the initial installation and maintenance.

3.0 QUALITY AND CONDITION

1. Native seed shall be obtained from sources east of the Mississippi River within the same EPA Level III Ecoregion as the project site (Central Corn Belt Plains). Plant origins outside of the Ecoregion shall be approved by the Wetland Consultant.

2. Native seeds shall be blended by the vendor, and the mixture and ratio shall be guaranteed in writing to be as specified. The amount of seed indicated on the specifications shall mean the total amount of pure live seed (PLS) per acre for all species listed. It is the sole responsibility of the Native Landscape Contractor to provide approved seed that meets industry-standard PLS requirements.

3. Native Landscape Contractor shall provide the Wetland Consultant with the name and location of the seed supplier, origin of the various kinds of plants, and a statement of the purity of the seed.

4. Seed shall conform to applicable State and Federal regulations as in effect on the date of letting. Unless otherwise specified, seed shall not contain in excess of 1 percent weed seeds; 0 percent is desirable.

5. All storage requirements, stratification, and scarification considerations shall be the sole responsibility of the Native Landscape Contractor.

6. Mycorrhizal inoculants shall be palletized and mixed at 1 lb. per acre with the fine seeds before installation. The inoculants shall contain a diverse mixture of Glomales fungal species (*Glomus* spp.) in palletized form.

7. Under no circumstances shall Wheat (*Triticum aestivum*), Cereal Rye (*Sacale cereale*), Perennial Rye (*Lolium perenne*), or Barley (*Hordeum vulgare*) be used as a temporary cover crop.

4.0 HANDLING

1. Native Landscape Contractor shall be solely responsible for the proper handling and storage of the seed according to the best seed handling and storage practices, including fungicide treatments and stratification considerations. Owner shall make no compensation for damage to the seed because of improper storage, cleaning, threshing, or screening operations.

2. All native seeds shall be packed and covered in such a manner as to ensure adequate protection against damage and maintain dormancy while in transit, storage, or during planting operations.

3. Seed shall be kept dry and unopened until needed for use. Seed shall not be stored or temporarily stored in locations or vehicles where the temperature will be in excess of 90 degrees F.

5.0 SITE PREPARATION

1. The General Contractor and Native Landscape Contractor shall be responsible for performing all work necessary to achieve and maintain an acceptable seedbed prior to seeding. All areas must be properly prepared before seeding begins. Underground utility location maps and plans should be reviewed prior to work. Equipment having low unit pressure ground contact shall be utilized within the planting areas.

2. Unless the Wetland Consultant agrees to another approach, the seedbed shall be prepared by working the topsoil to a depth of 3 inches. Site preparation equipment shall be of a design that can be utilized efficiently by the Native Landscape Contractor to meet the requirements for the work specified. The equipment proposed for use by the Native Landscape Contractor for disk and herbicide applications shall be subject to approval by the Wetland Consultant.

3. Prior to seeding, at least 6 inches of topsoil shall be present and free of all clods, stones, roots, sticks, rivulets, gullies, crusting, and cracking. The soil aggregate size will be no greater than 2 inches in the largest diameter.

4. If present, compacted soils shall be disked or raked prior to seeding. Remedial measures for the access area may, at the direction of the Wetland Consultant, involve ripping from 12 to 18 inches of the soil horizon prior to disking. If compaction is not a concern and the seedbed needs to be loosened prior to seeding to ensure good seed-soil contact, disking or raking shall be performed using equipment and the approach recommended by the Native Landscape Contractor, subject to approval by the Wetland Consultant.

5. If needed, cultivation shall occur within 24 hours prior to seeding. Seeding should occur immediately after the last cultivation preferably before a rain.

6.0 PLANT MATERIALS

Scientific Name	Common Name	Lbs/Ac
Festuca brevipila	Hard Fescue	51.0
Festuca ovina	Sheeps Fescue	45.0
Festuca rubra	Longflower W Fescue	65.0
Festuca rubra sub. Fallax	Chewing Fescue	54.0
Total		215.00

Table 2. Temporary Matrix Seed Mix - to be installed within the Low Profile Prairie, Wet to Mesic prairie, and sedge meadow planting zones planting zones.

Scientific Name	Common Name	Lbs/Ac
Avena sativa	Seed Oats	32.0
Elymus virginicus	Virginia Wild Rye	4.0
Lolium multiflorum	Annual Rye	4.0
Total		40.0

Table 3. Low Profile Prairie

Scientific Name	Common Name	Lbs/Acre
Agropyron trachycaulum	Slender Wheat Grass	1.000
Allium cernuum	Nodding Wild Onion	0.125
Amorpha canescens	Leadplant	0.125
Andropogon (Schizachyrium) scoparius	Little Bluestem	4.000
Anemone sp.	Anemone	0.063
Asclepias tuberosa	Butterfly weed	0.063
Asclepias verticillata	Whorled Milkweed	0.063
Aster azureus (olettangiensis)	Sky Blue Aster	0.031
Aster laevis	Smooth Blue Aster	0.063
Aster nova angliae	New England Aster	0.063
Astragalus canadensis	Canada Milk Vetch	0.031
Bouteloua curtipendula	Side Oats Gramma	5.000
Carex bicknellii	Bicknell's Sedge	0.125
Cassia (Chamaecrista) fasciculata	Partridge Pea	0.500
Cassia (Senna) marilandica	Maryland Senna	0.063
Careopsis lanceolata	Sand Coreopsis	0.500
Coreopsis palmata	Prairie Coreopsis	0.015
Echinacea hybrida	Pale Coneflower	0.125
Echinacea purpurea	Purple Coneflower	0.500
Elymus virginicus	Virginia Wild Rye	1.000
Eryngium yuccifolium	Rattlesnake Master	0.125
Helopsis helianthoides	Early Sunflower	0.063
Lespedeza capitata	Roundhead Bushclover	0.031
Liatris aspera	Button Blazing Star	0.015
Parthenium integrifolium	Wild Quinine	0.125
Penstemon digitalis	Foxglove Beardtongue	0.125
Petalostemum (Dalea) candidum	White Prairie Clover	0.015
Petalostemum (Dalea) purpureum	Purple Prairie Clover	0.063
Potentilla arguta	Prairie Cinquefoil	0.031
Pycnanthemum Species	ML Mint	0.031
Rudbeckia hirta	Black-eyed Susan	0.500
Rudbeckia subtomentosa	Sweet Coneflower	0.015
Silphium integrifolium	Rosinweed	0.125
Solidago (Euthamia) graminifolia	Grass-leaved Goldenrod	0.015
Solidago nemoralis	Old-field Goldenrod	0.046
Solidago (Oligoneuron) rigida	Stiff Goldenrod	0.125
Tradescantia ohioensis	Ohio Spiderwort	0.063
Verbena stricta	Hoary Vervain	0.125
Zizia aurea	Golden Alexander	0.063
Total		19.156

Table 4. Wet Mesic Prairie

Scientific Name	Common Name	Lbs/Ac
Andropogon (Schizachyrium) scoparius	Little Bluestem	2.000
Asclepias Species	Milkweed	0.063
Aster laevis	Smooth Blue Aster	0.031
Aster novae-angliae	New England Aster	0.031
Calamagrostis canadensis	Blue Joint Grass	0.031
Carex annectens xanthocarpa	Yellow Sedge	0.063
Carex bebbii	Bebb's Sedge	0.063
Carex bicknellii	Bicknell's Sedge	0.500
Carex normalis	Normal Sedge	0.063
Carex vulpinoidea	Fox Sedge	0.250
Cassia fasciculata	Partridge Pea	0.188
Elymus canadensis	Canadian Wild Rye	1.000
Elymus virginicus	Virginia Wild Rye	1.000
Epilobium coloratum	Cinnamon Willow Herb	0.015
Eupatorium perfoliatum	Boneset	0.015
Glyceria striata	Fowl Manna Grass	0.063
Hypericum pyramidatum	Great St. John'swort	0.063
Iris virginica shrevei	Blue Flag Iris	0.125
Juncus tenuis	Path Rush	0.031
Juncus torreyi	Torrey's Rush	0.031
Leersia oryzoides	Rice Cut Grass	0.031
Liatris pycnostachya	Prairie Blazingstar	0.313
Liatris spicata	Spike Blazingstar	0.188
Lobelia siphilitica	Blue Lobelia	0.031
Mimulus ringens	Monkey Flower	0.031
Monarda fistulosa	Bergamot	0.016
Panicum virgatum	Switch Grass	0.031
Parthenium integrifolium	Wild Quinine	0.125
Petalostemum (Dalea) purpureum	Purple Prairie Clover	0.250
Physostegia virginiana	False Dragonhead	0.063
Poa palustris	Marsh Blue Grass	0.063
Pycnanthemum virginicum	Common ML Mint	0.016
Ratibida pinnata	Yellow Coneflower	0.250
Rudbeckia hirta	Black-eyed Susan	0.250
Scirpus atrovirens	Dark Green Rush	0.500
Silphium laciniatum	Compass Plant	0.188
Silphium perfoliatum	Cup Plant	0.125
Solidago (Oligoneuron) riddellii	Riddell's Goldenrod	0.063
Solidago (Oligoneuron) rigida	Stiff Goldenrod	0.125
Spartina pectinata	Cord Grass	0.250
Sporobolus heterolepis	Droopseed	0.500
Verbena hastata	Blue Vervain	0.063
Vernonia fasciculata	Common Ironweed	0.016
Vernoniastrum virginicum	Culver's Physic	0.063
Zizia aurea	Golden Alexander	0.031

Table 5. Sedge Meadow/Wet Meadow

Scientific Name	Common Name	Lbs/Ac
Aster novae-angliae	New England Aster	0.125
Aster puniceus	Swamp Aster	0.031
Biens cernua	Nodding Bur Marigold	0.250
Calamagrostis canadensis	Sweet Indian Grass Plantain	0.031
Calamagrostis Species	Blue Joint Grass Reed Grasses	0.031
Carex annectens xanthocarpa	Yellow-fruited Sedge	0.125
Carex comosa	Bottlebrush Sedge	0.188
Carex granularis	Meadow Sedge	0.031
Carex hystericina	Porcupine Sedge	0.250
Carex lupuliformis	Knobbed Hop Sedge	0.125
Carex projecta	Necklace Sedge	0.125
Carex retrorsa	Retorse Sedge	0.063
Carex utriculata	Yellow Lake Sedge	0.031
Carex vulpinoidea	Fox Sedge	1.000
Eleocharis Species	Spike Rush Species	0.125
Elymus canadensis	Canada Wild Rye	1.000
Elymus virginicus	Virginia Wild Rye	2.000
Eupatorium maculatum	Spotted Joe Pye Weed	0.063
Eupatorium perfoliatum	Boneset	0.031
Gentiana andrewsii	Bottle Gentian	0.125
Helianum autumnale	Sneezeweed	0.063
Juncus dudleyi	Dudley's Rush	0.063
Juncus effusus	Common Rush	0.063
Juncus torreyi	Torrey's Rush	0.063
Liatris spicata	Spiked Gayfeather	0.125
Leersia oryzoides	Rice Cut Grass	0.125
Lycopodium americanum	Common Water Horehound	0.063
Lysimachia hybrida	River Loosestripe	0.031
Lythrum alatum	Winged Loosestripe	0.015
Mimulus ringens	Monkey Flower	0.015
Monarda fistulosa	Bergamot	0.125
Onoclea sensibilis	Sensitive Fern	0.031
Penstemon digitalis	Foxglove Beardtongue	0.125
Penthorum sedoides	Ditch Stonecrop	0.031
Physostegia virginiana	False Dragonhead	0.063
Poa palustris	Marsh Blue Grass	0.375
Polygonum Species	Smart Weed Species	0.750
Pycnanthemum virginianum	Common Mt. Mint	0.031
Rosa palustris	Swamp Rose	0.015
Rudbeckia subtomentosa	Sweet Coneflower	0.094
Scirpus atrovirens	Dark Green Rush	0.500
Scirpus cyperinus	Wool Grass	0.031
Solidago gigantea	Late Goldenrod	0.015
Solidago (Oligoneuron) ohioensis	Old Goldenrod	0.015
Solidago (Oligoneuron) riddellii	Riddell's Goldenrod	0.125
Spartina pectinata	Cord Grass	0.500
Sphenopholis intermedia	Shrill Meadow Grass	0.063
Thalictrum dasycarpum	Purple Meadow Rue	0.188
Veronica hastata	Blue Vervain	0.188
Vernonia fasciculata	Common Ironweed	0.125
Zizia aurea	Golden Alexander	0.063
Total		9.829

Table 6. Emergent Seed Mix

Scientific Name	Common Name	Lbs/Ac
Acorus americanus	Sweet Flag	0.250
Alisma subcordatum	Water Plantain	0.094
Carex comosa	Bottlebrush Sedge	0.375
Cephalanthus occidentalis	Bulbous Bush	0.125
Echinochloa crusgalli	Barnyard Grass	2.000
Eleocharis palustris	Marsh Spike Rush	0.063
Eleocharis Species	Spikerush Species	0.063
Glyceria grandis	Reed Manna Grass	0.031
Hibiscus laevis	Halberd-leaved Rose Mallow	0.063
Iris virginica shrevei	Blue Flag Iris	0.250
Juncus Species	Rush Species	0.188
Leersia oryzoides	Rice Cut Grass	0.500
Polygonum Species	Smart Weed Species	1.500
Pontederia cordata	Pickerehweed	0.063
Sagittaria latifolia	Common Arrowhead	0.500
Scirpus (Schoenoplectus) acutus	Hard Stem Bulrush	0.063
Scirpus fluviatilis	River Bulrush	0.125
Scirpus pungens	Chaimakers Rush	0.125
Scirpus validus	Great Bulrush	0.250
Spartanium eurycarpum	Bur Reed	1.000
Spartina pectinata Cord	Grass	0.375
Total		8.063

7.0 SEED INSTALLATION

1. Wetland Consultant shall be notified at least 24 hours prior to beginning the seeding operations.

2. Except where site conditions preclude their use, seeding shall be performed using a Truax drill, Truax Trillion seeder, or comparable equipment designed specifically for installation of native seed. For areas where site conditions preclude the use of specialized equipment, seed may be installed through hand broadcasting and lightly raking in the seed. Hand broadcast seed shall be spread at twice the specified rate. Other methods of seed installation may be used with prior approval from the Wetland Consultant.

3. Seasonal Considerations:

November 1 through February 28: Seed must be protected from displacement due to water and wind erosion. Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

March 1 through June 29: Seeding during this period is appropriate but germination of a portion of the seed may not occur until the following season due to lack of cold stratification to break seed dormancy. Cover crop generally germinates within 2-3 weeks of seeding operation.

June 30 through September 15: Installation of native seed should be suspended unless irrigation can be provided or unseasonably cool conditions persist. Also, any annual forbs planted with the mix during this time period may germinate but not have sufficient time to flower before fall senescence.

September 15 through October 31: Seeding on bare, graded surfaces must be protected with double netted erosion control blankets on slopes. Less cover crop will be observed during the following spring due to frost damage.

4. Prior to starting work, all seeding equipment shall be calibrated and adjusted to sow seeds at the proper seeding rate. In general, the optimum seeding depth is 0.25 inch below the soil surface. Areas where the seed has not been incorporated into the soil to the proper depths will not be accepted, and no compensation for materials or labor for the rejected work will be made by the Owner.

5. Equipment shall be operated in a manner to ensure complete, uniform coverage of the entire area to be seeded and to avoid damage to existing woody plants. Any area inadequately covered, as solely determined by the Wetland Consultant, shall be retreated at no additional cost to the Owner.

6. Seeding and soil tracking/firming shall not be done during periods of rain, severe drought, high winds, excessive moisture, frozen ground, or other conditions that preclude satisfactory results.

7. To achieve best results, seed boxes should be kept more than one-quarter full at all times and ground speed should be no more than 2 to 3 mph.

8. Seeding operations must occur when soil moisture is appropriate for seeding operation.

9. Native plant seed shall not receive fertilizer.

10. Wet seed that is moldy or otherwise damaged in transit or storage shall not be used.

11. After seeding operation is completed, install erosion control blanket per manufacturer's specifications as necessary.

8.0 EROSION CONTROL

1. The Native Landscape Contractor shall be fully responsible for implementing erosion control measures within prescribed planting areas.

2. All areas are recommended to be covered with erosion control blanket; North American Green S150 or equivalent will be used at a minimum. The outlets into the stormwater management facilities shall be stabilized with C-360. Erosion control blanket shall be installed within 24 hours after an area is seeded. See manufacturer's specifications for erosion control blanket composition.

9.0 "NO MOWING AND/OR DUMPING" SIGNAGE

1. "No Mowing and/or Dumping" or other signage approved by the Wetland Consultant shall be installed along the perimeter of the native plantings as indicated on the plan to define the boundary of the naturalized areas.

10.0 CLEAN-UP AND PROTECTION

1. During landscape work, store materials and equipment where directed. Keep pavements clean and work areas and adjoining areas in an orderly condition.

2. Protect landscape work and materials from damage due to landscape operations or operations by other trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed by the Wetland Consultant.

11.0 INSPECTIONS AND ACCEPTANCE

1. Owner reserves the right to inspect all seeds and plants either at place of growth or at site before planting for compliance with requirements for name, variety, size, quantity, quality or mix proportion.

2. Native Landscape Contractor is to keep records of the certificates of composition or invoices of seed mixtures and integrity of plant materials with respect to species, variety, and source after purchase.

3. Native Landscape Contractor is to notify Owner within five days after completing initial and/or supplemental plantings in each area.

MONITORING AND MANAGEMENT PLAN

1.0 MONITORING METHODOLOGY

The naturalized areas will be monitored annually for a three-year period to ensure successful establishment of the desired plant communities. The primary objective of the monitoring program is to track the success of the planted species over the 3-year monitoring period. The monitoring documents changes in plant community composition and reveals the need for management changes to improve floristic quality. Specific goals of the monitoring are to determine the vegetative species present, the percent cover by vegetation, and identify hydrology and erosion problems.

Monitoring within the naturalized areas shall be conducted annually utilizing a meander survey methodology during August, September, or early October of each year. The meander survey methodology involves reviewing at least 20 percent of each vegetative community, per location. The monitoring shall identify 1) the three most dominant vegetative species within each planting zone, 2) the percent survival of planted species, 3) the approximate total percent of vegetative coverage, 4) the approximate percent vegetative coverage by native, non-invasive species within each designed planting zone, 5) water level or drainage problems, and 6) the presence of bare soil areas larger than 0.25 square-meter. Observations shall be made during the monitoring to identify specific management strategies necessary to reach design goals. Site conditions shall be photo documented during monitoring sessions.

No woody plant materials are proposed within the naturalized areas. Any and all woody plantings within the parkways and other open space areas will be covered under the traditional landscape warranty.

2.0 PERFORMANCE CRITERIA

1. By the end of the first full growing season, the planted areas shall exhibit 90% vegetative cover, primarily by species contained in the temporary erosion control seed mix. There shall be no areas greater than 0.25 square meters devoid of vegetation and 25% of the species present as measured by aerial coverage shall be native and non-invasive.

2. By the end of the second growing season, 80% of the ground as measured by aerial coverage shall be vegetated and 30% of the species present, within each planting zone, as measured by aerial coverage shall be native and non-invasive.

3. By the end of the third growing season, 90% of the ground as measured by aerial coverage shall be vegetated. No more than 25% cover in any plant community shall be individually or collectively dominated by non-native or weedy species or by annuals. The native floristic quality index value (native FQI) must be greater than or equal to 15 as measured over all the planted areas. The floristic quality assessment method is described in Swink and Wilhelm, *Plants of the Chicago Region*.

4. During all years, none of the three-most dominant species may be non-native or weedy, including but not limited to: Canada Thistle (*Cirsium arvense*), Purple Loosestrife (*Lythrum salicaria*), Reed Canary Grass (*Phalaris arundinacea*), Sweet Clover (*Melilotus spp.*), Kentucky Bluegrass (*Poa pratensis*), Barnyard Grass (*Echinochloa crusgalli*), Common Reed (*Phragmites australis*), or Sandbar Willow (*Salix interior*) unless otherwise indicated on the approved planting plan. Cattail species (*Typha* spp.) do not count towards the 25% weed criterion provided they represent no more than 20% cover and there are at least two other native, non-weedy perennial species as dominants.

5. 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.

3.0 REPORTING

An annual vegetation monitoring report will be submitted to Gallagher & Henry, U.S. Army Corps of Engineers and the Village of Orland Park by January 31 following the monitoring season each year.

4.0 MANAGEMENT PLAN

1. **First Year:** Mow the planted areas to a height of 6-8 inches 2-4 times during the early growing season and as needed to control non-native and invasive species. Mowing (including weed whipping) shall take place prior to or when non-native and invasive species are flowering so as to prevent seed set. Control undesirable plant species, when present in small quantities, by hand pulling prior to the development and maturity of the plant. Hand removal shall include the removal of all aboveground and belowground stems, roots and flower masses prior to development of seeds. Apply herbicide (as necessary) to non-native and invasive species within the naturalized areas with appropriate herbicide.

Herbicides should be applied by a trained and licensed applicator. Non-selective herbicides can be used but with utmost caution. Non-selective herbicides are absorbed through the plant tissues and work their way into the root system, effectively killing the plant. The only acceptable non-selective herbicides are glyphosate based such as Roundup, Rodeo, or Razer. The only acceptable selective herbicides (i.e. targeting broad leaf and woody plants) are 2,4-D (2,4-Dichlorophenoxyacetic acid) based or triclopyr based such as Galion 4.

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.

2. **Second Year:** Control of undesirable plant species during the second growing season shall consist primarily of herbicide application. Mowing (including weed whipping) shall be conducted two to four times during the early growing season and as needed to a height of 6 to 8 inches to prevent annual weeds from producing seed.

3. **Third Year:** Undesirable plant species will be controlled (as necessary) by mowing (including weed whipping), hand pulling, and/or spot herbicide application. At the completion of the third growing season (dependent on fuel availability, dominance of graminoid species, i.e. grasses and sedges, is required for successful burning), fire may be introduced to the planted areas as the primary management tool. Trained professionals experienced in the fuel types present shall conduct burning. State and local permits shall be obtained prior to prescribed burning. Prior to a prescribed burn, surrounding property owners as well as local police and fire departments will be notified. A burn plan designating the preferred wind direction and speed, location of firebreaks, and necessary personnel and equipment shall be prepared and utilized in planning and burn implementation.

The initial burn shall be dependent on fuel availability that is directly related to the quantity and quality of grasses, sedges, and forbs present within the planting area. The burn season runs from November 1 through April 30 and burns shall be conducted whenever conditions are suitable. Generally, a new prairie/wetland area shall be burned annually for two years after the third growing season and then every other year thereafter, burning approximately 50-75% of the area.

4. **Long Term:** As the planted areas mature, required supplemental management will be significantly reduced. The plant communities will stabilize and be effectively managed through prescribed burning. Mowing to prevent seed set of undesirable species and spot herbicide application are recommended when and where applicable.