

DEPARTMENT OF PUBLIC WORKS
OFFICE OF THE COMMISSIONER
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

February 17, 2022

To: Public Facilities Committee
From: James McGonagle, Commissioner of Public Works
Subject: Library Lot Construction Project



Councilors,

Please see the attached additional information on the library lot construction project. The attachments include:

Estimate of the probable construction costs
Information on stormwater mitigation via a letter to the Massachusetts Department of Environmental Protection
Executive Summary of the stormwater report from the consultant
Drainage and utility plan
Parking plan
Traffic sign and pavement marking plan
Landscape design information

This project has been vetted and approved by the Newton Library Board of Trustees and DPW has kept the Library Board and Library Director updated throughout the planning process.

Since the Public Facilities Committee last discussed this project in April 2021, additional lighting was included to enhance safety and to meet lighting level specifications at the request of the Library Director and Board of Trustees. The attached drainage and utilities plan highlights the light locations in red.

In addition to the lighting change, there is a reduction of one parking space making the total number of spaces 205 instead of 206, which is an increase of 20 spaces from existing conditions. One parking space was lost to create one additional striped access aisle to provide for an EV charger space that is ADA accessible. Prior to the construction of the solar panel canopy, there were five (5) marked accessible spaces. The five marked accessible spaces were one short of the required number, and they were not fully compliant with all ADA standards. The proposed parking lot will include seven (7) fully ADA-compliant accessible parking spaces, with five (5) "standard" accessible spaces and two (2) van accessible parking spaces. In addition, there will be an eighth space that meets ADA requirements at the EV charging stations.

Please feel free to reach out with any questions prior to the Public Facilities Committee meeting.

City of Newton
Department of Public Works



Opinion of Probable Construction Cost
Newton - Free Library Parking Lot Improvements

DATE: 25-Jan-22

| ITEM | UNIT | ITEM DESCRIPTION | PRICE | QTY | TOTAL |
|-----------|------|--|-------------|--------|---------------|
| * 102.1 | FT | TREE TRIMMING | \$ 18.00 | 500 | \$ 9,000.00 |
| * 102.511 | EA | TREE PROTECTION ARMORING AND PRUNING | \$ 375.00 | 14 | \$ 5,250.00 |
| 102.521 | FT | TREE AND PLANT PROTECTION FENCE | \$ 15.00 | 200 | \$ 3,000.00 |
| * 120.1 | CY | UNCLASSIFIED EXCAVATION | \$ 50.00 | 1,780 | \$ 89,000.00 |
| * 141.1 | CY | TEST PIT FOR EXPLORATION | \$ 120.00 | 10 | \$ 1,200.00 |
| 146. | EA | DRAINAGE STRUCTURE REMOVED | \$ 1,100.00 | 9 | \$ 9,900.00 |
| * 151 | CY | GRAVEL BORROW | \$ 50.00 | 110 | \$ 5,500.00 |
| 151.2 | CY | GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES | \$ 60.00 | 300 | \$ 18,000.00 |
| 156. | CY | CRUSHED STONE | \$ 50.00 | 280 | \$ 14,000.00 |
| * 158 | SY | TEMPORARY ACCESS DRIVE | \$ 30.00 | 140 | \$ 4,200.00 |
| * 170. | SY | FINE GRADING AND COMPACTING - SUBGRADE AREA | \$ 12.50 | 9,300 | \$ 116,250.00 |
| * 201. | EA | CATCH BASIN | \$ 5,000.00 | 9 | \$ 45,000.00 |
| * 202. | EA | MANHOLE | \$ 5,000.00 | 4 | \$ 20,000.00 |
| * 203. | EA | MANHOLE (6 FOOT DIAMETER) | \$ 8,200.00 | 2 | \$ 16,400.00 |
| 220. | EA | DRAINAGE STRUCTURE ADJUSTED | \$ 500.00 | 1 | \$ 500.00 |
| 220.2 | FT | DRAINAGE STRUCTURE REBUILT | \$ 500.00 | 1 | \$ 500.00 |
| 220.6 | FT | SANITARY STRUCTURE REBUILT | \$ 500.00 | 4 | \$ 2,000.00 |
| 220.7 | EA | SANITARY STRUCTURE ADJUSTED | \$ 500.00 | 4 | \$ 2,000.00 |
| * 222.3 | EA | FRAME AND GRATE (OR COVER) MUNICIPAL STANDARD | \$ 975.00 | 20 | \$ 19,500.00 |
| * 223.1 | EA | FRAME AND GRATE (OR COVER) REMOVED AND STACKED | \$ 100.00 | 9 | \$ 900.00 |
| * 251.041 | FT | 4 INCH PERFORATED HIGH-DENSITY POLYETHYLENE PIPE (HDPE) | \$ 50.00 | 590 | \$ 29,500.00 |
| * 251.06 | FT | 6 INCH HIGH-DENSITY POLYETHYLENE PIPE (HDPE) | \$ 60.00 | 170 | \$ 10,200.00 |
| * 251.118 | EA | 18 INCH HIGH-DENSITY POLYETHYLENE PIPE (HDPE) FLARED END | \$ 1,000.00 | 1 | \$ 1,000.00 |
| 251.121 | FT | 12 INCH PERFORATED HIGH-DENSITY POLYETHYLENE PIPE (HDPE) | \$ 120.00 | 710 | \$ 85,200.00 |
| * 251.18 | FT | 18 INCH HIGH-DENSITY POLYETHYLENE PIPE (HDPE) | \$ 180.00 | 30 | \$ 5,400.00 |
| 258. | SY | STONE FOR PIPE ENDS | \$ 75.00 | 10 | \$ 750.00 |
| 358. | EA | GATE BOX ADJUSTED | \$ 250.00 | 1 | \$ 250.00 |
| * 403. | SY | RECLAIMED PAVEMENT FOR BASE COURSE AND/OR SUB-BASE | \$ 12.00 | 7,960 | \$ 95,520.00 |
| 440. | LB | CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL | \$ 0.50 | 1,940 | \$ 970.00 |
| * 450.23 | TON | SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) | \$ 150.00 | 860 | \$ 129,000.00 |
| * 450.31 | TON | SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) | \$ 160.00 | 1,070 | \$ 171,200.00 |
| * 461 | SF | POROUS PAVEMENT | \$ 15.00 | 10,600 | \$ 159,000.00 |
| * 472. | TON | TEMPORARY ASPHALT PATCHING | \$ 200.00 | 290 | \$ 58,000.00 |
| * 504. | FT | GRANITE CURB TYPE VA4 - STRAIGHT | \$ 60.00 | 1,870 | \$ 112,200.00 |
| * 504.1 | FT | GRANITE CURB TYPE VA4 - CURVED | \$ 70.00 | 380 | \$ 26,600.00 |
| * 509. | FT | GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - STRAIGHT | \$ 65.00 | 130 | \$ 8,450.00 |
| * 509.1 | FT | GRANITE TRANSITION CURB FOR PEDESTRIAN CURB RAMPS - CURVED | \$ 75.00 | 70 | \$ 5,250.00 |
| * 580. | FT | CURB REMOVED AND RESET | \$ 30.00 | 860 | \$ 25,800.00 |
| * 594. | FT | CURB REMOVED AND DISCARDED | \$ 6.00 | 400 | \$ 2,400.00 |
| * 657. | FT | TEMPORARY CONSTRUCTION FENCE | \$ 25.00 | 400 | \$ 10,000.00 |
| * 697. | FT | SEDIMENTATION FENCE | \$ 7.00 | 1,210 | \$ 8,470.00 |

City of Newton
Department of Public Works



Opinion of Probable Construction Cost
Newton - Free Library Parking Lot Improvements

DATE: 25-Jan-22

| ITEM | UNIT | ITEM DESCRIPTION | PRICE | QTY | TOTAL |
|------------------------|------|--|---------------|-------|---------------------|
| * 697.1 | EA | SILT SACK | \$ 215.00 | 9 | \$ 1,935.00 |
| * 697.3 | FT | SEDIMENTATION BARRIER | \$ 12.00 | 1,210 | \$ 14,520.00 |
| * 701 | SY | CEMENT CONCRETE SIDEWALK | \$ 85.00 | 320 | \$ 27,200.00 |
| * 701.1 | SY | CEMENT CONCRETE SIDEWALK AT DRIVEWAYS | \$ 100.00 | 30 | \$ 3,000.00 |
| * 701.2 | SY | CEMENT CONCRETE PEDESTRIAN CURB RAMP | \$ 125.00 | 110 | \$ 13,750.00 |
| * 707.8 | EA | STEEL BOLLARD | \$ 2,000.00 | 17 | \$ 34,000.00 |
| * 708 | EA | STEEL BOLLARD REMOVED AND RESET | \$ 750.00 | 8 | \$ 6,000.00 |
| * 748 | LS | MOBILIZATION | \$ 60,000.00 | 1 | \$ 60,000.00 |
| * 751 | CY | LOAM BORROW | \$ 55.00 | 60 | \$ 3,300.00 |
| * 756 | LS | NPDES STORMWATER POLLUTION PREVENTION PLAN | \$ 10,000.00 | 1 | \$ 10,000.00 |
| * 765 | SY | SEEDING | \$ 2.00 | 490 | \$ 980.00 |
| * 767.6 | CY | AGED PINE BARK MULCH | \$ 80.00 | 85 | \$ 6,800.00 |
| * 799 | LS | LANDSCAPING | \$ 130,000.00 | 1 | \$ 130,000.00 |
| * 804.15 | FT | 1 1/2 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC - (UL) | \$ 55.00 | 1,500 | \$ 82,500.00 |
| * 811.27 | EA | ELECTRICAL HANDHOLE (MUNICIPAL STANDARD) | \$ 2,000.00 | 18 | \$ 36,000.00 |
| * 811.37 | EA | ELECTRIC HANDHOLE ADJUSTED | \$ 350.00 | 2 | \$ 700.00 |
| * 812.09 | EA | LIGHT STANDARD FOUNDATION PRECAST | \$ 2,000.00 | 18 | \$ 36,000.00 |
| * 813.3 | FT | WIRE TYPE 7 NO. 10 GENERAL PURPOSE | \$ 2.25 | 6,000 | \$ 13,500.00 |
| * 813.521 | FT | WIRE TYPE 10 - #10 GROUNDING AND BONDING | \$ 2.50 | 1,500 | \$ 3,750.00 |
| * 813.72 | EA | GROUND ROD 10 FT LONG | \$ 150.00 | 27 | \$ 4,050.00 |
| * 823.01 | EA | PARKING LOT LIGHT POLE AND LUMINAIRE (SINGLE) | \$ 4,500.00 | 9 | \$ 40,500.00 |
| * 823.02 | EA | PARKING LOT LIGHT POLE AND LUMINAIRE (DOUBLE) | \$ 5,500.00 | 2 | \$ 11,000.00 |
| * 823.03 | EA | SIDEWALK LIGHT POLE AND LUMINAIRE | \$ 4,000.00 | 8 | \$ 32,000.00 |
| * 823.51 | EA | PHOTO ELECTRIC CONTROL | \$ 500.00 | 1 | \$ 500.00 |
| * 823.52 | EA | MULTIPLE CONTROL CONTACTOR | \$ 1,200.00 | 2 | \$ 2,400.00 |
| * 823.53 | EA | TIME CLOCK | \$ 980.00 | 1 | \$ 980.00 |
| * 823.71 | EA | PARKING LOT LIGHT POLE AND LUMINAIRE REMOVED AND DISCARDED | \$ 850.00 | 8 | \$ 6,800.00 |
| * 832 | SF | WARNING-REGULATORY AND ROUTE MARKER - ALUM. PANEL (TYPE A) | \$ 13.00 | 120 | \$ 1,560.00 |
| * 847.1 | EA | SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWY POST ASSEM.-STEEL | \$ 150.00 | 39 | \$ 5,850.00 |
| * 852.01 | LS | TEMPORARY TRAFFIC CONTROL | \$ 30,000.00 | 1 | \$ 30,000.00 |
| * 854.014 | FT | TEMPORARY PAVING MARKINGS - 4 INCH (PAINTED) | \$ 0.25 | 5,110 | \$ 1,277.50 |
| * 864.041 | SF | PAVEMENT ARROWS AND LEGENDS REFL. WHITE (THERMOPLASTIC) | \$ 22.00 | 720 | \$ 15,840.00 |
| * 866.104 | FT | 4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) | \$ 1.00 | 5,110 | \$ 5,110.00 |
| * 866.112 | FT | 12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) | \$ 5.00 | 30 | \$ 150.00 |
| * 874.2 | EA | TRAFFIC SIGN REMOVED AND RESET | \$ 100.00 | 8 | \$ 800.00 |
| * 874.4 | EA | TRAFFIC SIGN REMOVED AND STACKED | \$ 30.00 | 16 | \$ 480.00 |
| * 874.8 | EA | MISCELLANEOUS SIGN REMOVED AND RESET | \$ 2,000.00 | 1 | \$ 2,000.00 |
| * 999 | ALL | POLICE DETAILS (allowance for approx. 480 HRS at \$55/HR) | \$ 26,400.00 | 1 | \$ 26,400.00 |
| Subtotal | | | | | \$ 1,998,893 |
| 15% Contingency | | | | | \$ 299,834 |
| Total | | | | | \$ 2,298,726 |
| SAY | | | | | \$ 2,299,000 |



May 25, 2021

Ms. Danielle Mucciarone
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

**RE: DEP File # NE 239-0889
330 Homer Street, Newton, Massachusetts**

Dear Ms. Mucciarone,

This letter is regarding your comments on the above referenced project dated May 12, 2021. The project includes the reconstruction of the proposed parking lot at the Newton Free Public Library, including the installation of a high-performance stormwater management system and substantial supplemental plantings throughout the property, including adjacent to the existing intermittent stream and Bordering Vegetated Wetland. Only a portion of the site and work area are within the 100-foot buffer to the stream and BVW.

The existing site includes a stormwater management system that was installed prior to the adoption of the Massachusetts Stormwater Management Standards and currently offers no stormwater treatment. This redevelopment project has been designed to comply with the Massachusetts Stormwater Management Standards to the maximum extent practicable consistent with the requirements for redevelopment project. It has also been designed to help the City of Newton reduce phosphorus loading consistent with the Massachusetts Small Municipal Separate Storm Sewer Systems (MS4) Permit requirements. The project has been designed to collect and infiltrate the first inch of rainfall, resulting in a significant reduction of over 90% of phosphorus loading from the property.

The comments in the May 12, 2021 NOI review requests additional information regarding total suspended solids removal prior to discharge to the on-site infiltration system. The project is utilizing the stormwater 'collection and conveyance system,' which consists of perforated PVC pipe set in ¾-inch stone, to infiltrate stormwater. Stormwater collected by catch basins, designed with sumps and hoods, is discharged to the perforated PVC pipes where the stormwater is infiltrated into the ground. The proposed catch basins provide 25% Total Suspended Solids (TSS) removal per the Massachusetts Stormwater Standards; the perforated pipe system will allow further treatment of the stormwater prior to any overflow being discharged to the outfall. We have classified the project as a Land Use with Higher Potential Pollutant Loads (LUHPPL) due to the number of trips expected to be generated by the parking lot consistent with Standard 5. The proposed 25% TSS removal provided by the catch basins and the anticipated treatment resulting from the perforated pipes meets the standard of 'maximum extent practicable' required of redevelopment projects for a number of reasons. (1) Although classified as a LUHPPL, the project is not an industrial use which

generates a greater pollutant load than a parking lot. (2) The design of the system must be very shallow due to estimated seasonal high groundwater. In order to provide adequate separation to estimated seasonal high groundwater, the proposed system includes a rim to invert elevation differential of 2.5 feet. Therefore, all structures, including any water quality structures, will need to have a low profile design, which eliminates most proprietary devices. (3) Adding additional oil/grit separators would require excavation, possibly within groundwater, which would have negative dewatering, erosion, and sedimentation impacts. Due to these site constraints, we feel the proposed project meets the Stormwater Management Standards to the maximum extent practicable consistent with the requirements for a redevelopment project.

In addition, the proposed project includes significant other low impact development best management practices, including stormwater planters and porous pavements, not typically included in most redevelopment projects. The high infiltration component of the project results in the complete infiltration of 90% of all rainfall events, which is extremely high for both new development and redevelopment projects.

With regard to construction related erosion and sediment control impacts, the plan set provided with the Notice of Intent application and as revised in response to staff comments includes an erosion and sedimentation control plan located on Sheet C-07 of the plan set. This plan will be supplemented by a Stormwater Pollution Prevention Plan (SWPPP) as required by the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP). The SWPPP is required to be prepared two weeks prior to construction. We will prepare the SWPPP consistent with the NPDES CGP requirements.

Our project team has had extensive coordination with the Newton Conservation Office staff. We understand they are supportive of the proposed design and submittal documentation. This project was heard by the Newton Conservation Commission on May 13. At this hearing, the Commission voted to close the hearing and issue an Order of Conditions. I hope this letter addresses any concerns you may have regarding the project. If you have any additional questions, please call me at 617-429-3288.

Sincerely,



Environmental Partners Group, Inc.
Scott D. Turner, PE, AICP, LEED AP ND
Director of Planning
C: 617.429.3288
E: sdt@envpartners.com

SECTION 1 EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of site improvements to the Newton Free Library at 330 Homer Street in Newton, Massachusetts (subsequently referred to as the "site"). This report also supports the Notice of Intent application for the proposed redevelopment. The site, which contains approximately 4.61 acres of land, contains an existing parking lot, the Newton Free Library building, associated landscaping, and wetland resource areas.

The proposed site improvements consist of redesigning the existing parking lot to include 21 additional parking spaces; 0.25 acres of porous pavement; an innovative stormwater collection system that collects, treats, and infiltrates all stormwater generated for the 1-inch storm; and a 95% removal rate of generated stormwater phosphorus loads (compared to a current phosphorus removal rate of 0%). The redesign also accommodates the installation of solar panels above the proposed parking areas that were approved previously under a separate Order of Conditions. This report addresses a comparative analysis of the pre- and post-development site runoff conditions.

Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the supplemental development plans prepared by Environmental Partners. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at one (1) "design point" where stormwater runoff currently drains to under existing conditions. This design point is the existing bordering vegetated wetland located between the existing parking lot and library building. A summary of the existing and proposed conditions OF peak runoff rates for the 1-inch, 2-, 10-, 25-, and 100-year storms can be found in Table 1 below. In addition, the project has been designed to meet or exceed the following: Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards; The Newton Department of Public Works' Requirements for On-Site Drainage (Stormwater Management) 2017; and phosphorus removal requirements as detailed herein.

90% of all 24 hour storm events in Massachusetts include less than one-inch of total rainfall. This project has been designed to infiltrate all flows generated by the parking lot up to the 1-inch storm even in order to maximize the amount of phosphorus removal, consistent with the requirements of the 2016 Massachusetts Small Municipal Separate Storm Sewer System (MS4) permit.

Table 1: Design Point Peak Runoff Rate Summary

| | Peak Flow Discharge in cubic feet per second (cfs) | | | | | | | | | | | | | | |
|------------|--|-------|-------|--------|-------|-------|---------|-------|-------|---------|-------|-------|----------|-------|-------|
| | 1-inch | | | 2-year | | | 10-year | | | 25-year | | | 100-year | | |
| | Exist | Prop. | Delta | Exist | Prop. | Delta | Exist | Prop. | Delta | Exist | Prop. | Delta | Exist | Prop. | Delta |
| DP1 | 0.34 | 0.00 | -0.34 | 4.40 | 3.75 | -0.65 | 8.32 | 6.76 | -1.56 | 10.78 | 8.63 | -2.15 | 15.94 | 12.35 | -3.59 |

**Flows are represented in cubic feet per second (cfs)*



Environmental Partners
A Partnership for engineering solutions.

MARK DATE DESCRIPTION

| | | | | |
|-------|-----------|--------------|------------|-------------|
| Scale | DATE | Drawn by | Checked by | Approved by |
| | JULY 2019 | R229-1055 CO | | |

THIS LINE IS ONE INCH AT FULL SCALE ON A 22" X 34" SHEET

NEWTON FREE LIBRARY PARKING LOT
NEWTON, MASSACHUSETTS

Sheet No.

3

AS NOTED



NO. OF PARKING SPACES:
EXISTING: 185
PROPOSED: 206 (+21)

ALTERNATIVE 3

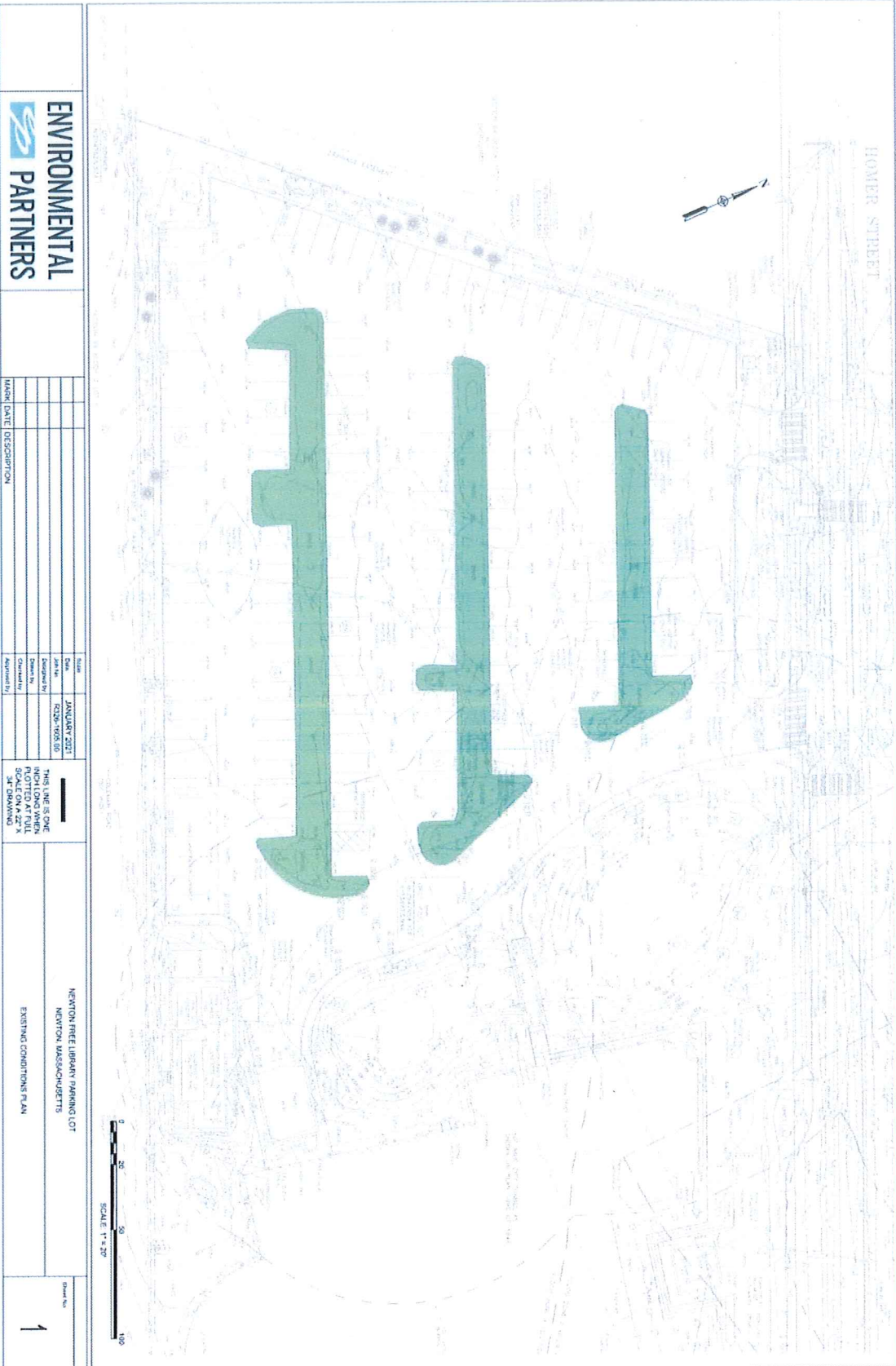
HOMER STREET

SCALE: 1" = 20'

Newton Free Library

Parking Lot Renovation Program and Objectives

- ◆ Landscape mitigation for loss of landscape islands due to solar canopy construction
- ◆ 3 areas to address:
 - ◆ *NEW LANDSCAPE ISLANDS*: combination of upland (dry) and rain garden plantings
 - ◆ *HOMER STREET ISLAND*: removal of invasive Burning Bush shrubs, Shadblow trees in poor condition, and a refresh of the landscape
 - ◆ *WETLAND BASIN*: sloped monoculture grass area to be replaced with a “Designed Plant Community” of diverse natives to provide stabilization and improved habitat



ENVIRONMENTAL PARTNERS

| DATE | DESCRIPTION | APPROVED BY |
|--------------|-------------|-------------|
| JANUARY 2011 | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

THIS LINE IS ONE FOOTING WHEN PLOTTED ON TOLL SCALE DRAWING

NEWTON FREE LIBRARY PARKING LOT
NEWTON MASSACHUSETTS
EXISTING CONDITIONS PLAN

Sheet No. 1

EXISTING ISLANDS LOST TO CONSTRUCTION

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1. NEW LANDSCAPE ISLANDS

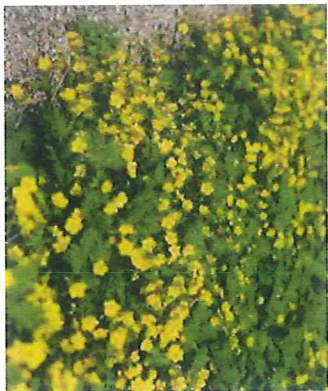
169-22



LITTLE BLUESTEM



PENNSYLVANIA SEDGE



BARREN STRAWBERRY



BLACK-EYED SUSAN



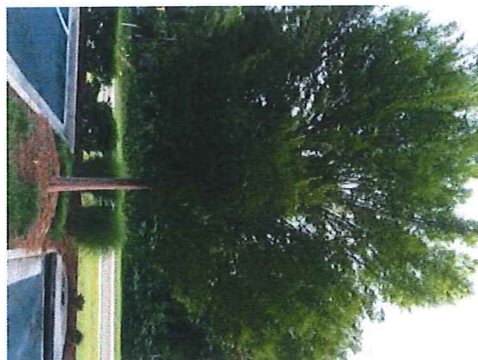
WILD BERGAMOT



COREOPSIS



BUTTERFLY MILKWEED



LACEBARK ELM



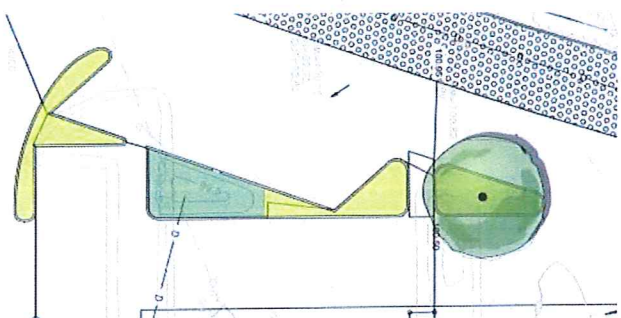
JAPANESE LILAC

UPLAND ISLAND PLANTINGS

| Latin Name | Common Name |
|---------------------------------|---------------------|
| ULMUS PARVIFLORA | LACEBARK ELM |
| SYRINGA RETICULATA | JAPANESE LILAC |
| ASCLEPIAS TUBEROSA | BUTTERFLY MILKWEED |
| COREOPSIS LANCEOLATA | WHORLED TICKSEED |
| MONARDA FISTULOSA | WILD BERGAMOT |
| RUDEBECKIA 'AMERICAN GOLD RUSH' | BLACK-EYED SUSAN |
| CAREX PENNSYLVANICA | PENNSYLVANIAN SEDGE |
| SCHIZACHYRIUM SCOPARIUM | LITTLE BLUESTEM |
| WALDSTENIA FRAGARIOIDES | BARREN STRAWBERRY |



UPLAND ISLAND PLANTINGS



1. NEW LANDSCAPE ISLANDS

169-22



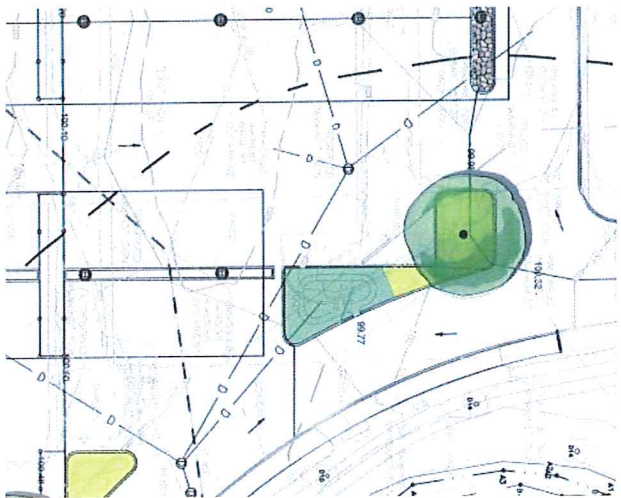
EROSION CONTROL SEED MIX - SIDE SLOPES



WILD BERGAMOT

RAIN GARDEN PLANTINGS

| Latin Name | Common Name |
|---------------------------------|---------------------|
| ASTER NOVAE-ANGIAE | NEW ENGLAND ASTER |
| LIATRIS ASPERA | ROUGH BLAZING STAR |
| LOBELIA CARDINALIS | CARDINAL FLOWER |
| MONARDA FISTULOSA | WILD BERGAMOT |
| RUDEBECKIA 'AMERICAN GOLD RUSH' | BLACK-EYED SUSAN |
| CAREX PENSYLVANICA | PENNSYLVANIAN SEDGE |
| PANICUM VIRGATUM | SWITCH GRASS |



RAIN GARDEN PLANTINGS



ASTER



ROUGH BLAZING STAR



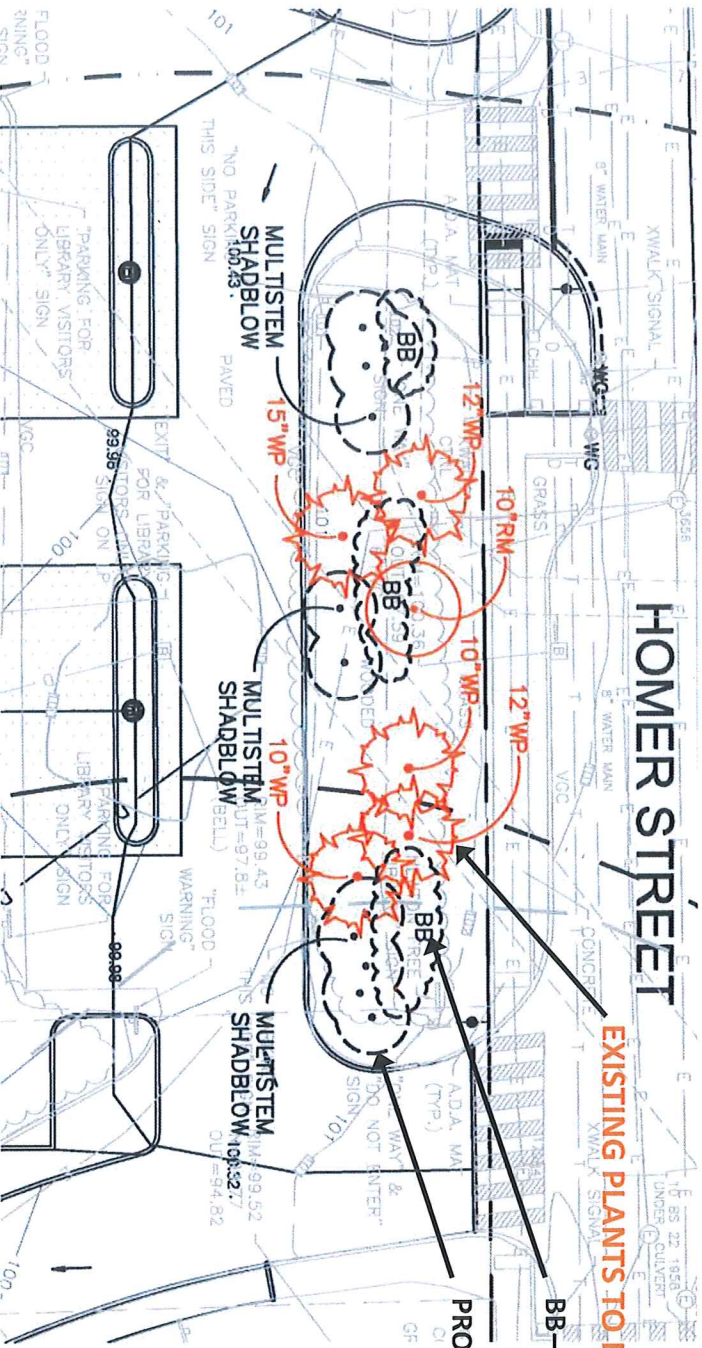
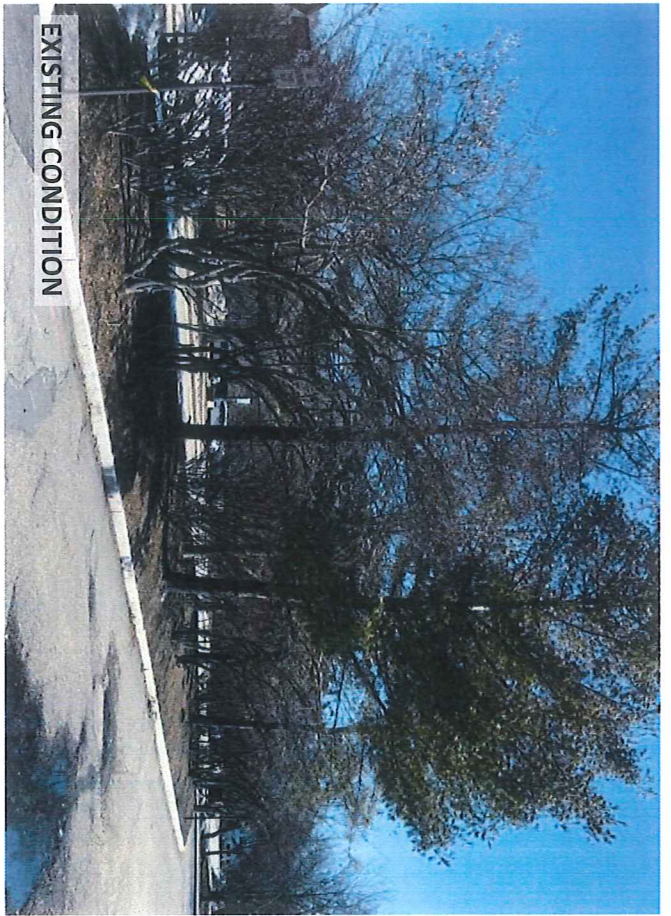
SWITCH GRASS



BLACK-EYED SUSAN



CARDINAL FLOWER



HOMER STREET

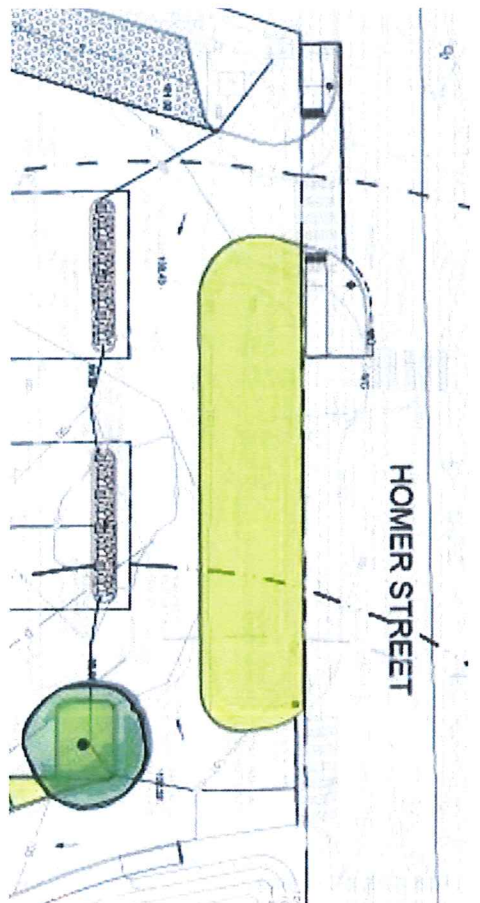
EXISTING PLANTS TO REMAIN

BB—BURNING BUSH

PROPOSED REMOVALS

WP = White Pine
 RM = Red Maple

2. HOMER STREET ISLAND



HOMER STREET



GRAY DOGWOOD



WITCHHAZEL



DIERVILLA



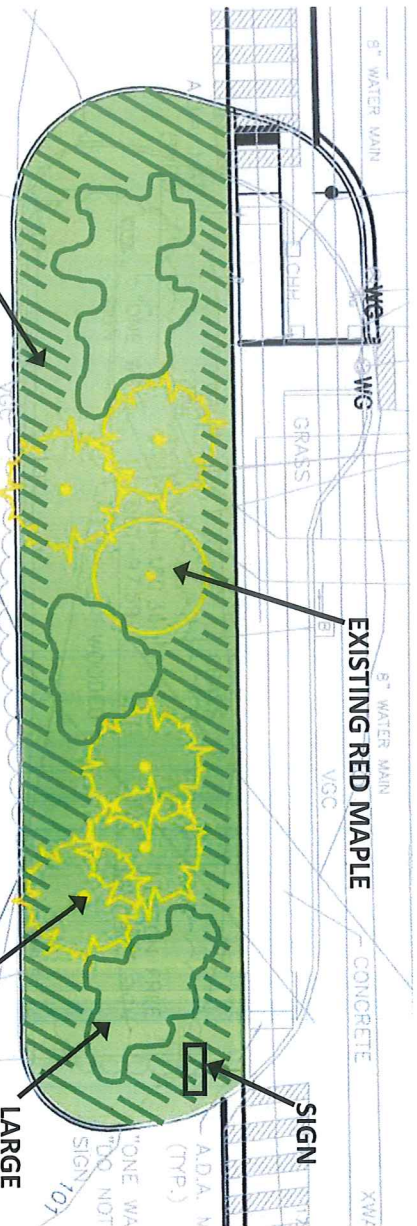
INKBERRY



NORTHERN BAYBERRY



WINTERGREEN



GROUNDCOVERS, PERENNIALS, GRASSES
2. HOMER STREET ISLAND

| Latin Name | Common Name |
|---------------------------|-------------------------|
| CORNUS RACEMOSA | GRAY DOGWOOD |
| HAMAMELIS VIRGINIANA | AMERICAN WITCHHAZEL |
| DIERVILLA 'KODIAK ORANGE' | KODIAK ORANGE DIERVILLA |
| ILEX GLABRA | INKBERRY |
| MYRICA PENNSYLVANICA | NORTHERN BAYBERRY |
| GAULTHERIA PROCUMBENS | WINTERGREEN |
| LIATRIS ASPERA | ROUGH BLAZING STAR |
| ASCLEPIAS TUBEROSA | BUTTERFLY MILKWEED |
| SOLIDAGO SPECIOSA | SHOWY GOLDENROD |
| OENOTHERA FRUITICOSA | EVENING PRIMROSE |
| DESCHAMPSIA FLEXUOSA | WAVY HAIR GRASS |
| MOLINIA CAERULEA | PURPLE MOOR GRASS |
| ANDROPOGON GERARDII | BIG BLUESTEM |



ROUGH BLAZING STAR



SHOWY GOLDENROD



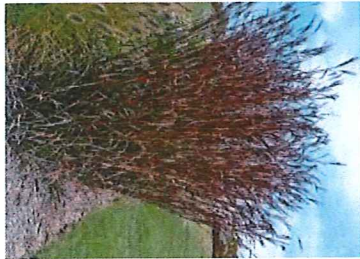
BUTTERFLY MILKWEED



EVENING PRIMROSE



PURPLE MOOR GRASS

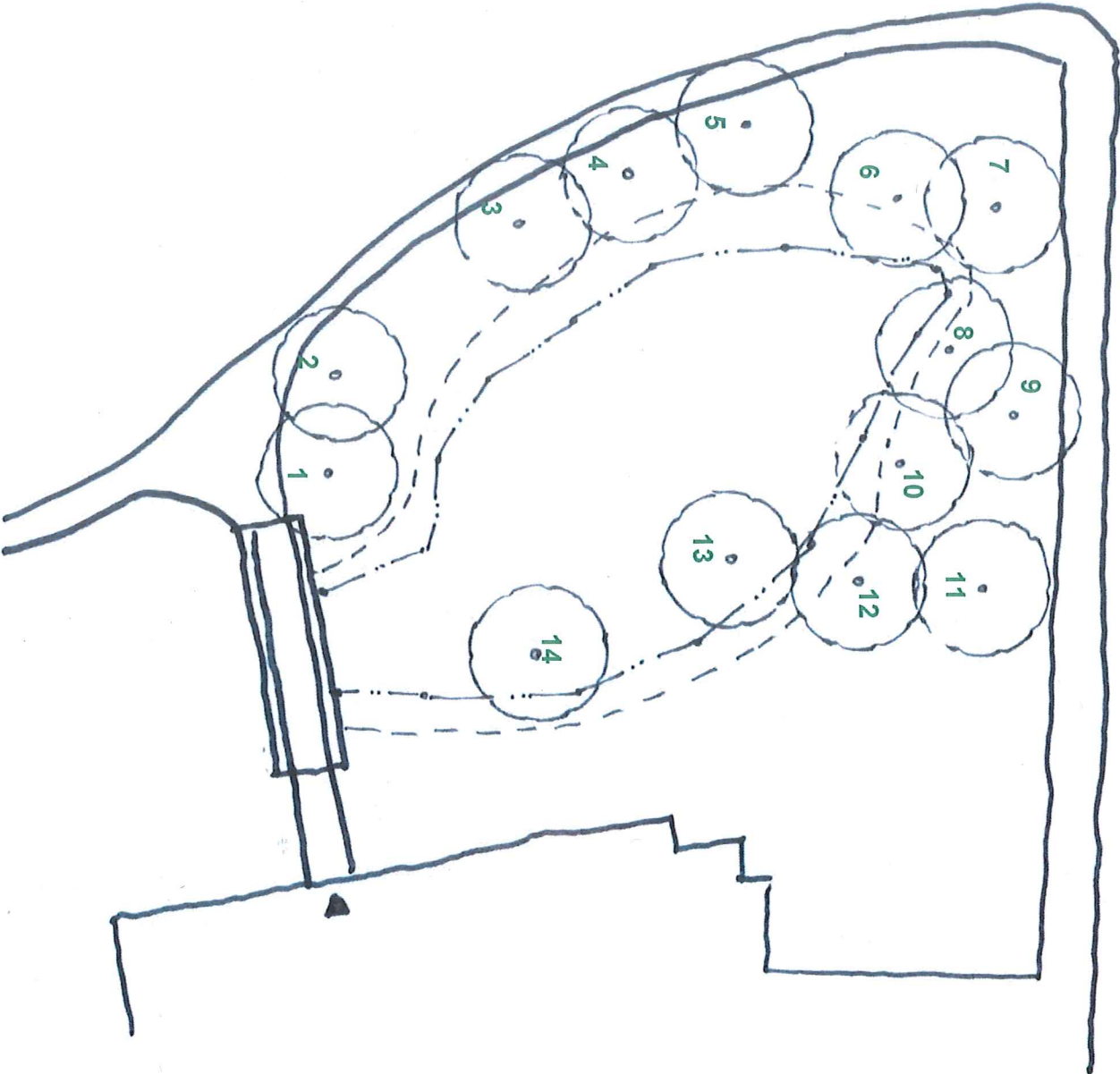


BIG BLUESTEM



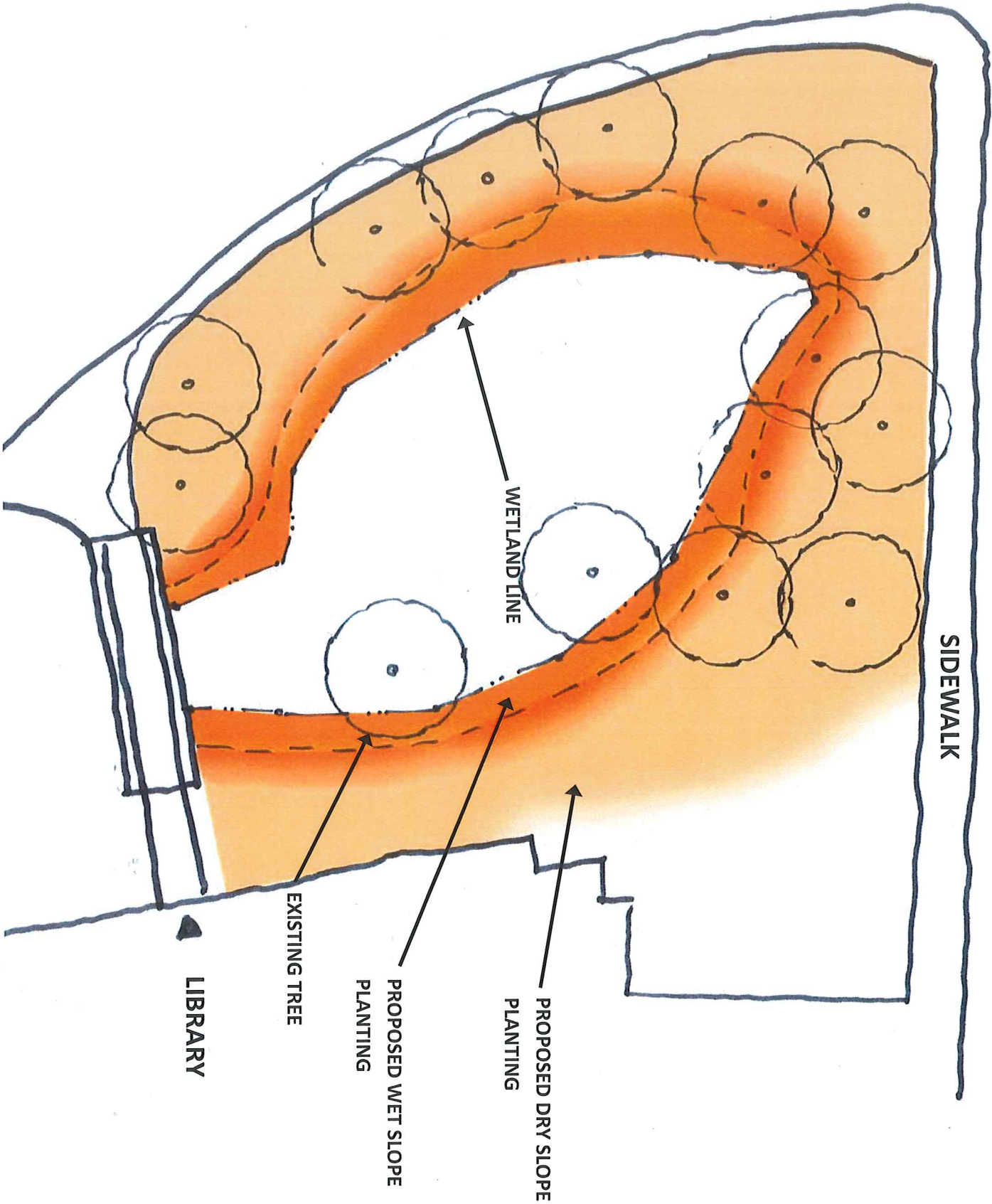
WAVY HAIR GRASS

3. WETLAND BASIN—EXISTING TREES TO BE PRESERVED



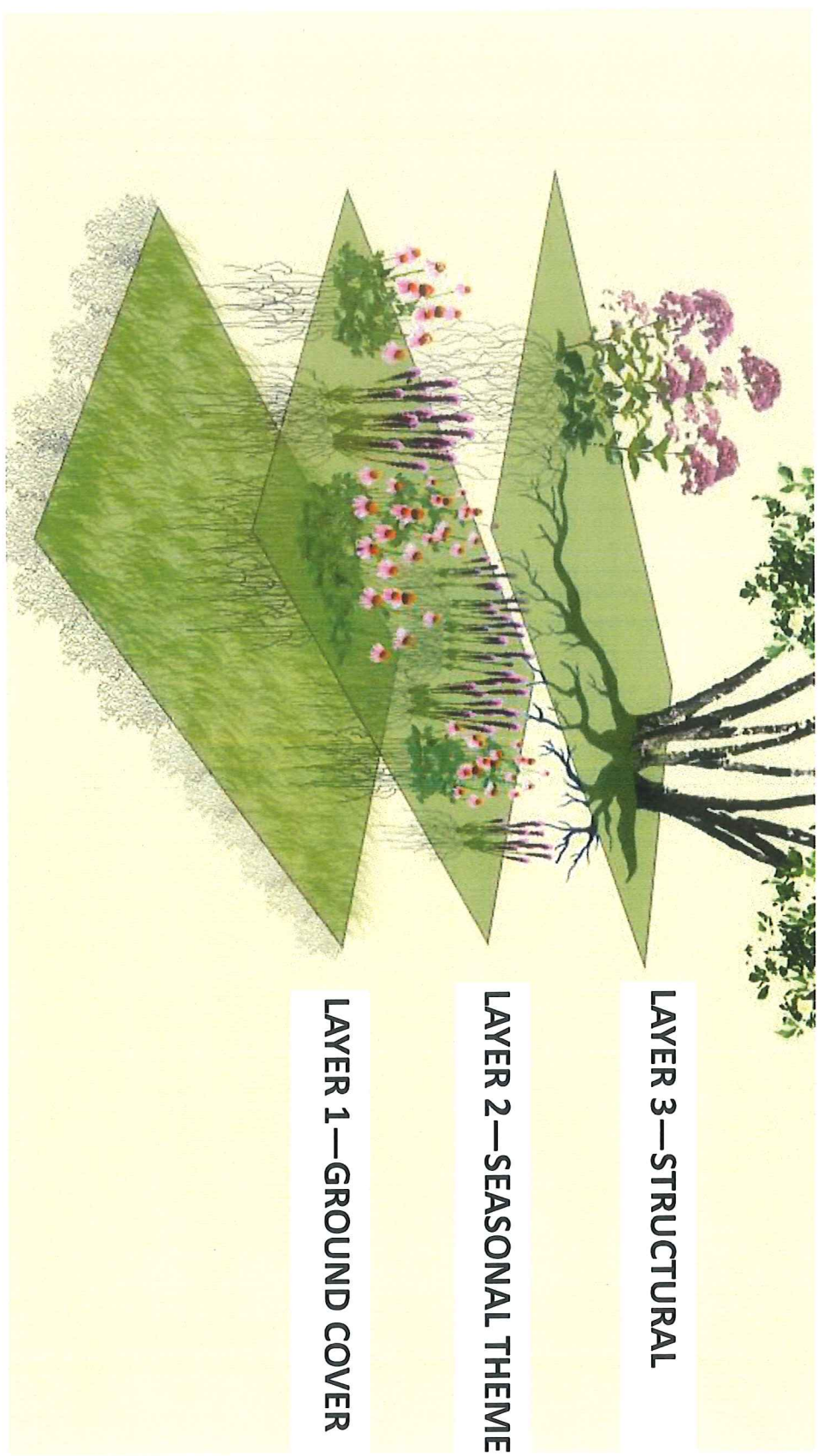
| Tree # | Species |
|--------|-----------|
| 1 | Beech |
| 2 | Beech |
| 3 | Red Maple |
| 4 | Birch |
| 5 | Red Maple |
| 6 | Red Maple |
| 7 | Cherry |
| 8 | Red Maple |
| 9 | Red Maple |
| 10 | Red Maple |
| 11 | Beech |
| 12 | ? |
| 13 | Willow |
| 14 | Willow |

3. WETLAND BASIN—PLANTING



3. WETLAND BASIN—PROPOSED PLANTING SCHEME

169-22



LAYER 3—STRUCTURAL

LAYER 2—SEASONAL THEME PLANTS

LAYER 1—GROUND COVER

Designed Plant Community

3. WETLAND BASIN—PLANTING

LAYER 1—GROUND COVER

169-22

UPPER SLOPE



PENNSYLVANIA SEDGE, COVER CROP

* DRY CONDITION

LOWER SLOPE

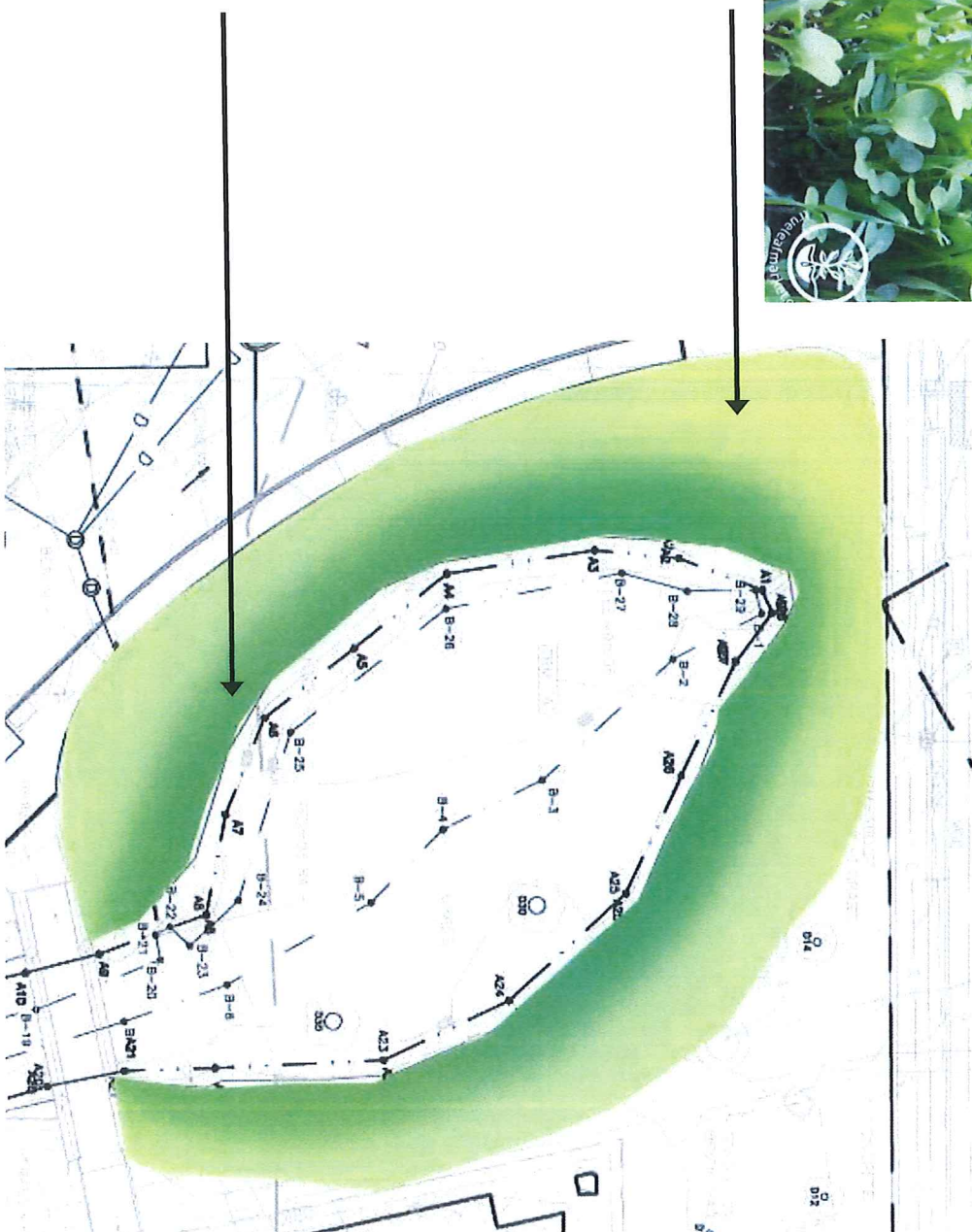


SEERSUCKER SEDGE

* WET CONDITION

BASIN - LAYER 1

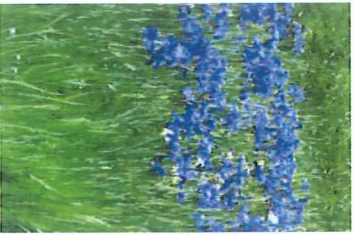
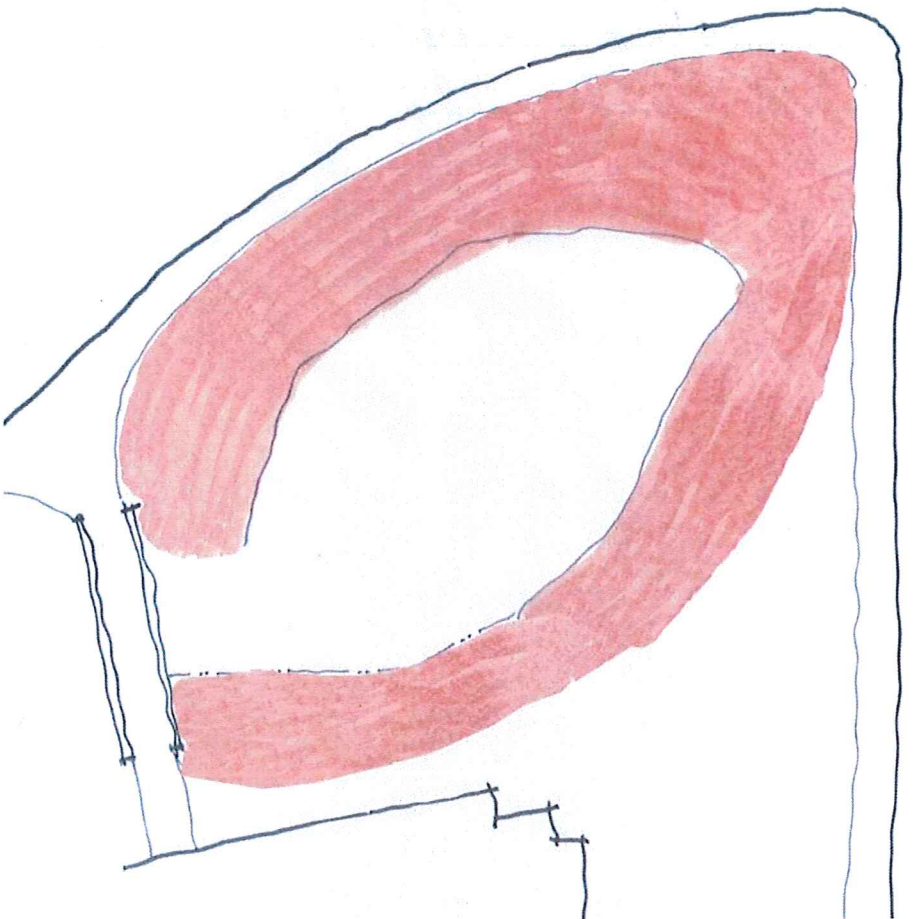
| Latin Name | Common Name |
|---------------------|---------------------|
| CAREX PENNSYLVANICA | PENNSYLVANIAN SEDGE |
| CAREX PLANTAGINEA | SEERSUCKER SEDGE |
| | COVER CROP |



3. WETLAND BASIN—PLANTING LAYER 2—SEASONAL THEME PLANTS



| Latin Name | Common Name | Type |
|------------------------------------|--------------------|------------|
| ASCLEPIAS TUBEROSA | BUTTERFLY MILKWEED | PERENNIAL |
| AMSONIA TABERNAEMONTANA 'BLUE ICE' | BLUE STAR AMSONIA | PERENNIAL |
| MONARDA FISTULOSA | WILD BERGAMOT | PERENNIAL |
| RUDEBECKIA 'AMERICAN GOLD RUSH' | BLACK-EYED SUSAN | PERENNIAL |
| IRIS VERSICOLOR | BLUE FLAG IRIS | PERENNIAL |
| LIATRIS ASPERA | ROUGH BLAZING STAR | PERENNIAL |
| DRYOPTERIS SP. | WOOD FERN | PERENNIAL |
| PANICUM VIRGATUM | SWITCH GRASS | ORN. GRASS |
| SCHIZACHYRIUM SCOPARIUM | LITTLE BLUESTEM | ORN. GRASS |
| LIATRIS ASPERA | ROUGH BLAZING STAR | PERENNIAL |



IRIS *WET



WILD BERGAMOT *WET



SWITCHGRASS *WET



LITTLE BLUESTEM *DRY



BUTTERFLY MILKWEED *DRY



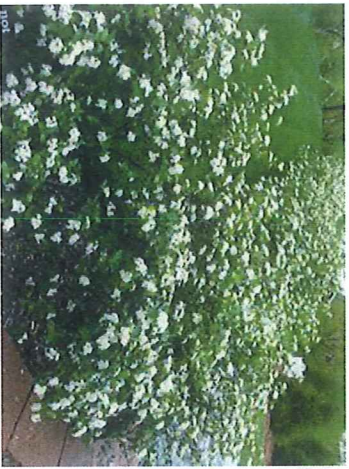
BLACK-EYED SUSAN *DRY



ROUGH BLAZING STAR *DRY

3. WETLAND BASIN—PLANTING

LAYER 3—STRUCTURAL



RED CHOKEBERRY - SUMMIER



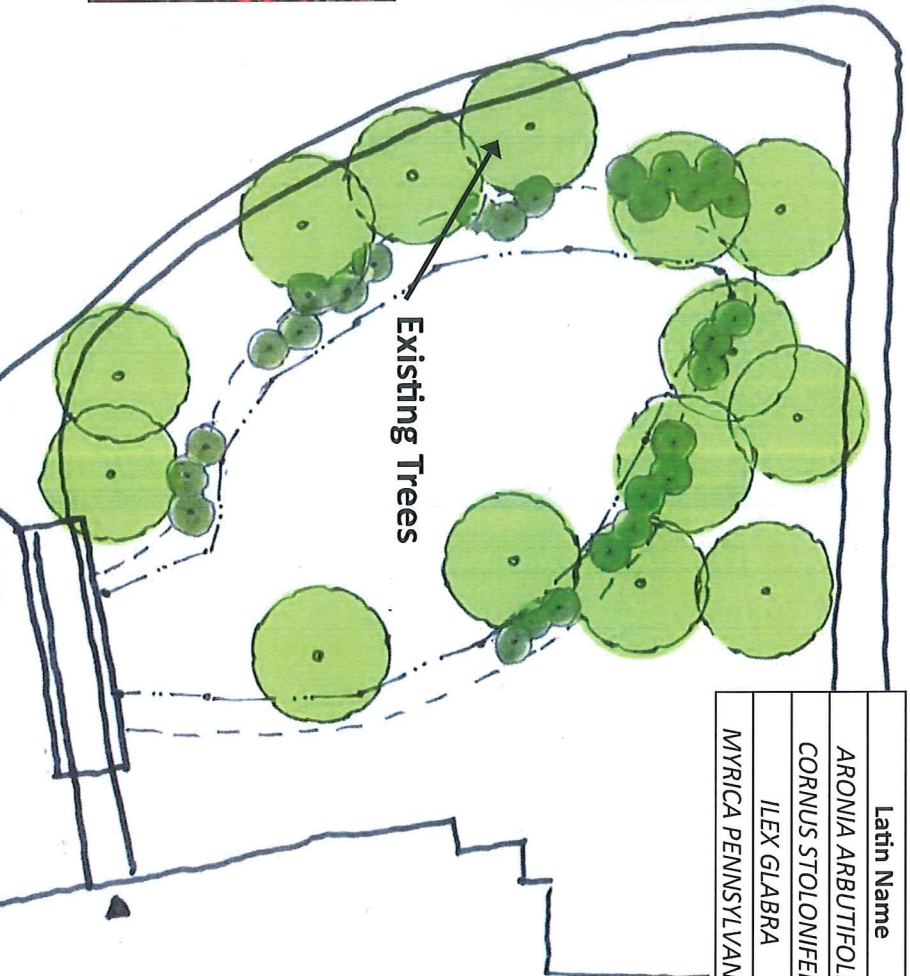
RED CHOKEBERRY - WINTER



RED CHOKEBERRY - FALL

BASIN - LAYER 3

| Latin Name | Common Name |
|----------------------|-------------------|
| ARONIA ARBUTIFOLIA | RED CHOKEBERRY |
| CORNUS STOLONIFERA | RED OSIER DOGWOOD |
| ILEX GLABRA | INKBERRY |
| MYRICA PENNSYLVANICA | NORTHERN BAYBERRY |



NORTHERN BAYBERRY



INKBERRY



DOGWOOD - WINTER



DOGWOOD - SUMMER

Design Principles

Soils are key

Mix young and old, small and large plants

As much density as possible to minimize weed growth

Construction Principles

Spring installation is best

Minimize disturbance - strip existing sod + follow up immediately with plantings

Minimize amendments to soils

Fence before and after planting to protect

Minimize heavy equipment

Will require a long term management plan