#### Green Area Ratio (GAR): Background, Administration & Process

ELLER AND

Photo credit: Oculus, Inc.

#### AGENDA

- Zoning Regulations Review
- Green Area Ratio Regulation
- Regulatory Triggers
- Administrative Process
- Related Regulations (Pervious Surface/Parking Lots)
- Landscape Elements & Guidebook Status
- Examples

# **Zoning Regulations Review**

- Revision to zoning regulation passed January 2016
- Improve clarity, ease of use, relevance
- Diagnosis of barriers to sustainability policy area
- Zoning Commission weighed in on recommendations on....
  - Integrating Land Use and Mobility
  - Energy Conservation and Renewable Energy
  - Water and Sensitive Resource Protection
  - Food Security
  - Green Jobs
  - Large Area Development

# ZRR and changes to GAR

- Zoning Regulations Review passed January 2016
- GAR regulation revisions became effective
   September 6, 2016 for building permit applications submitted after this date or as otherwise noted in regulation
- For additional information on transition: http://dcoz.dc.gov

# Green Area Ratio

#### What is it?

 A flexible green site design requirement that varies by zone.

#### **How Achieve?**

 Choose from a range of environmental landscape practices each of which have been assigned an environmental performance ranking.

#### Examples may include...

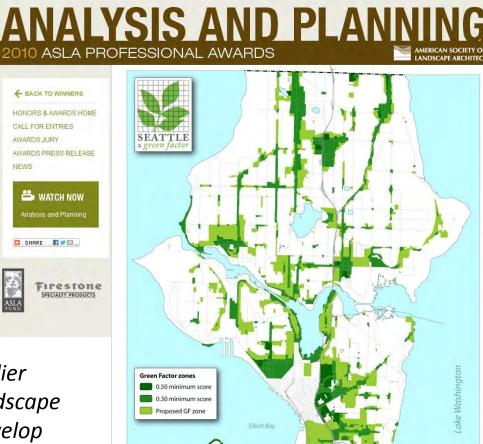
- Permeable pavement
- Green roofs
- Natural ground cover
- Rain gardens
- Trees & shrubs
- Green facades



# Seattle Green Factor

#### Stated Priorities:

- Livability
- Ecosystem Services
- Climate Change Adaptation



*"Emphasizing landscape in site planning. Earlier involvement in the design process allows landscape architects to exercise more creativity and develop innovative design solutions."* 

#### GAR: How Does it Work?

#### How to calculate:

# Add up landscape elements by number or size

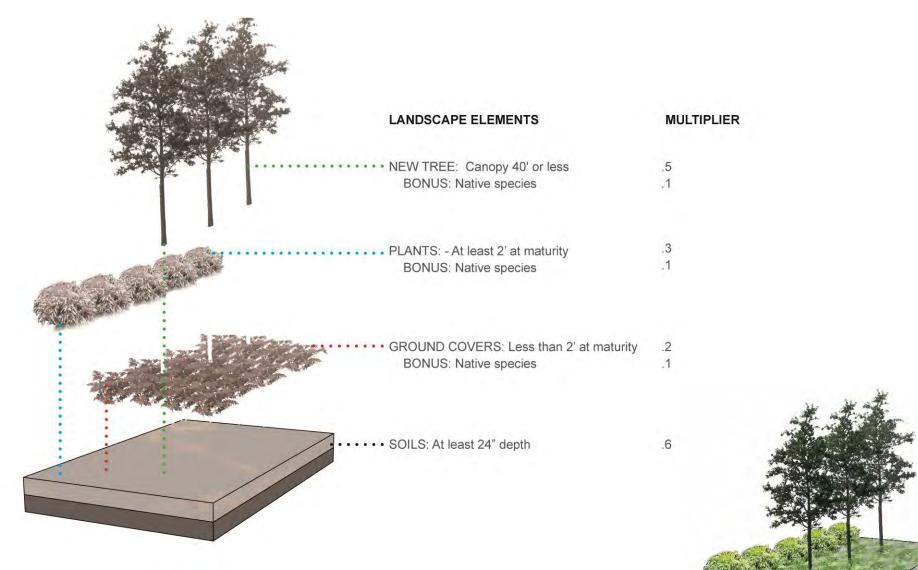
- # trees
- Size of green roof
- Size of rain garden
- # of plants
- Soil depths
- Divide by lot area
- = GAR score

 $GAR = \frac{(area of landscape element 1 x multiplier) +}{Lot Area}$ 



| GAR LANDSCAPE ELEMENTS  | MULTIPLIER |  |  |  |  |  |  |
|---|------------|--|--|--|--|--|--|
| Landscaped area (select one of the following for each area)                 |            |  |  |  |  |  |  |
| Landscaped areas with a soil depth of less than 24"                         | 0.3        |  |  |  |  |  |  |
| Landscaped areas with a soil depth of 24" or more                           | 0.6        |  |  |  |  |  |  |
| Bioretention facilities   | 0.4        |  |  |  |  |  |  |
| Plantings   |            |  |  |  |  |  |  |
| Ground covers, or other plants less than 2' tall at maturity                | 0.2        |  |  |  |  |  |  |
| Plants at least 2' tall at maturity   | 0.3        |  |  |  |  |  |  |
| Tree canopy for all new trees with mature canopy spread of 40' or less      | 0.5        |  |  |  |  |  |  |
| Tree canopy for all new trees with mature canopy spread of 40' or greater   | 0.6        |  |  |  |  |  |  |
| Tree canopy for preservation of existing trees 6" to 24" in diameter        | 0.7        |  |  |  |  |  |  |
| Tree canopy for preservation of existing trees 24" diameter or larger       | 0.8        |  |  |  |  |  |  |
| Vegetated wall, plantings on a vertical surface                             | 0.6        |  |  |  |  |  |  |
| Vegetated roofs   |            |  |  |  |  |  |  |
| Extensive vegetated roof over at least 2" but less than 8" of growth medium | 0.6        |  |  |  |  |  |  |
| Intensive vegetated roof over at least 8" of growth medium                  | 0.8        |  |  |  |  |  |  |
| Permeable paving  |            |  |  |  |  |  |  |
| Permeable paving over at least 6" and less than 2' of soil or gravel        | 0.4        |  |  |  |  |  |  |
| Permeable paving over at least 2' of soil or gravel                         | 0.5        |  |  |  |  |  |  |
| Other   |            |  |  |  |  |  |  |
| Enhanced tree growth systems  | 0.4        |  |  |  |  |  |  |
| Renewable energy generation (area of)                                       | 0.5        |  |  |  |  |  |  |
| Water features (using at least 50% recycled water)                          | 0.2        |  |  |  |  |  |  |
| Bonuses   |            |  |  |  |  |  |  |
| Native plant species  | 0.1        |  |  |  |  |  |  |
| Landscaping in food cultivation   | 0.1        |  |  |  |  |  |  |
| Harvested stormwater irrigation   | 0.1        |  |  |  |  |  |  |

## Stackable Elements



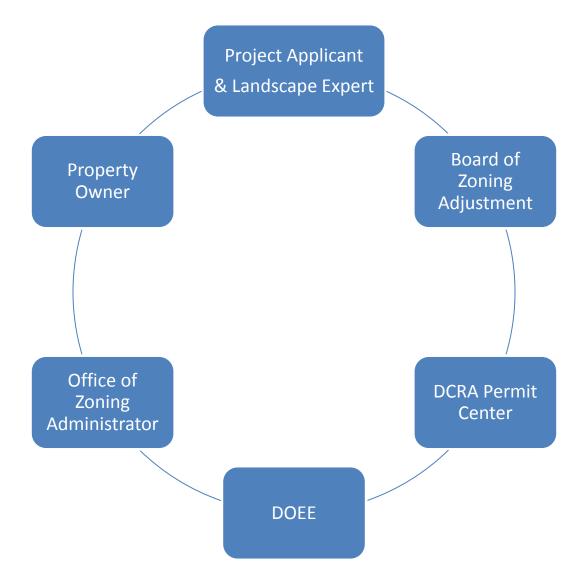
#### GAR required by Zone District

new zone districts, effective September 6, 2016

| Zone District   | Green Area Ratio       |
|---|------------------------|
| RA-1, RA-2, RA-6, RA-7, RA-8<br>RC-1; WR-2, WR-3, WR-4, WR-5, WR-7, WR-8  | 0.40                   |
| RA-3, RA-4, RA-5, RA-9, RA-10<br>MU-1, MU-2, MU-3, MU-4, MU-5, MU-6, MU-12, MU-13, MU-14, MU-<br>15, MU-16, MU-17, MU-18, MU-19, MU-23, MU-24, MU-25, MU-26,<br>MU-27,<br>NC-1, NC-2, NC-3, NC-4, NC-5, NC-7, NC-9, NC-10, NC-11, NC-14, NC-16,<br>NC-17<br>SEFC-2, SEFC-3, CG-1, CG-2, RC-2, RC-3<br>ARTS-1, ARTS-2, D-2, CG-5 | 0.30                   |
| MU-7, MU-8, MU-28<br>NC-6, NC-8, NC-12, NC-13, NC-15, ARTS-3, CG-5  | 0.25                   |
| MU-9, MU-10, MU-20, MU-21, MU-22, MU-29<br>D-3, D-4 , D-5, D-1-R, D-4-R, D-5-R, D-6, D-6-R, D-7, D-8<br>SEFC-1, CG-4, ARTS-4, CG-3  | 0.20                   |
| <ul> <li>PDR (all lots unless otherwise noted):</li> <li>Lot with principal building that is one (1) story in height</li> <li>Lot with principal building that is two (2) stories in height</li> </ul>  | 0.30<br>• 0.1<br>• 0.2 |

## REGULATION TRIGGERS & & ADMINISTRATIVE PROCESS

## **Involved** Parties

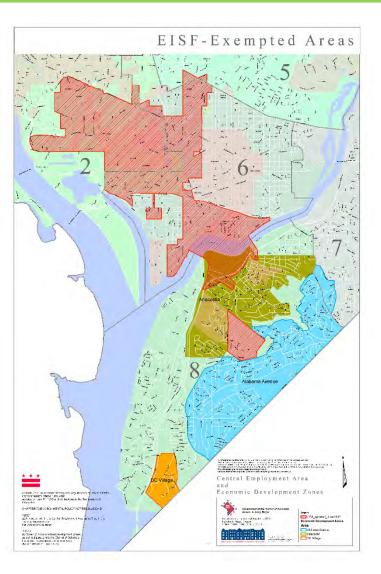


# Who does not have a GAR?

- Buildings that do not require a certificate of occupancy,
  - Single family residences
- DC Water wastewater treatment facilities.
- Interior renovations of existing buildings when,
  - Central Employment Area,
  - 100 percent lot occupancy,
  - Existing roof not capable of supporting vegetated system, and
  - Proposed work does not result in a roof capable of supporting vegetated roof.
- Buildings or structures deemed "historic resources",
  - Except when additions increase the gross floor area by 50 percent.

# Who does not have a GAR?

- Buildings that do not require a occupancy,
  - Single family residences.
- DC Water wastewater treatme
- Interior renovations of existing
  - Central Employment Area,
  - 100 percent lot occupancy,
  - Existing roof not capable of supp and
  - Proposed work does not result in supporting vegetated roof.
- Buildings or structures deemed
  - Except when additions increase percent.



#### **Exemption Form**

#### **GOVERNMENT OF THE DISTRICT OF COLUMBIA** DEPARTMENT OF CONSUMER REGULATORY AFFAIRS



APPLICATION FOR EXEMPTION STATUS FROM D.C. ZONING REGULATION GREEN AREA RATIO

[APPLICANT TO FILL OUT]

Thereby request evidence of exemption from the Green Area Ratio (GAR) Subinle C Chapter 6 of DCMR Title TI for the proposed construction on the property identified below.

| Square: Lot: Permit Number:   |   |
|---|---|
| wable Exemptions (CHECK ONE):   | Required<br>Signatures  |
| Single dwelling unit (Subtitle A §302.2); buildings otherwise not requiring a certificate of occupancy (Subtitle C §601.3).   | OZA   |
| Any property within a R-, RF-, USN, STE, HE, WR-1, and WR-6 Districts (Sublitle C §601.2).  | OZĄ   |
| Municipal wastewater treatment facilities operated by DC Water and Sewer Authority (Subutle C §601.3(b)).   | DCWater and<br>OZA  |
| Building(s) or structure(s) certified by the DC inventory of Historic Sites, or State Historic Preservation Officer, as<br>"historic resource(s)", additions increase the gross floor area by less than 50 percent (Subtitle C §601 3(d), §601 7).  | Historic and OZA  |
| Additions, interior renovations, or both are less than 100 percent of the assessed building value as set forth in the records of the Office of Tax and Revenue as of the date of the building permit application (Subtrile C \$601.3)   | OZA   |
| Interior Renovations: (a) Central Employment Area. (b)100 percent for occupancy, (c) existing roof not capable of<br>supporting végetated system, and (d) proposed work does not result in a roof capable of supporting vegetated roof.<br>(Vate: all four couldnoss are required for this essemption). (Subtitle C §601.3) | Structural and OZA  |
|   | Wable Exemptions (CHECK ONE):           Single dwelling unit (Subtitle A \$302.2); buildings otherwise not requiring a certificate of occupancy (Subtitle C \$601.3).           Any property within a R-, RF-, USN, STE, HE, WR-1, and WR-6 Districts (Subtitle C \$601.2).           Municipal wastewater treatment facilities operated by DC Water and Sever Anthonity (Subtitle C \$601.3(b)).           Building(s) or structure(s) certified by the DC Inventory of Listoric Sites, or State Historic Preservation Officer, as "historic resource(s)", additions increase the gross floor area by leas than 30 percent (Subtitle C \$601.3(b)).           Additions, interior renovations, or both are less than 100 percent of the assessed building value as set forth in the records of the Office of Tax and Revenue as of the date of the building permit application (Subtitle C \$601.3)           Interor Renovations (a) Central Employment Area, (b)100 percent to occupancy, (c) existing roof net capable of supporting vegetated system, and (d) proposed work does not real in a nof capable of supporting vegetated system, and (d) proposed work does not perate in a pathe of capable of supporting vegetated system, and (d) proposed work does not perate in a pathe of capable of supporting vegetated system, and (d) proposed work does not perate in a pathe of capable of supporting vegetated system. |

Applicant Name: Address

| Date: | Phone:  |
|-------|---------|
| Date. | r none. |

[FOR DCRA USE ONLY] 1 find there is sufficient evidence the existing roof for the property is NOT capable of supporting a vegetated system.

I find there is sufficient evidence the proposed work will NOT result in a roof capable of supporting a vegetated system.

This review does not constitute an interpretation of zaning or building codes and does not entitle the applicant to any relief nor authorized by coming or building code officials pursuant to the applicable cades.

Signature: Printed Name: Date STATE HISTORIC PRESERVATION OFFICER I hereby certify that this property is either a historic landmark or a building or structure contributing to the character of a historic district listed in the D.C. Inventory of Historie Sites. This certification does not constitute an interpretation of zoning or building codes and does not entitle the applicant to any relief not authorized by zaning or building code officials pursuant to the applicable codes. Signature: Printed Name: Date: OFFICE OF ZONING ADMINISTRATOR ONLY [Exemption Categories-Subitle C \$601] Single dwelling unit or buildings otherwise not requiring a certificate of occupancy R and RF zoning district Municipal wastewater treatment facilities operated by DC WASA Central Employment Area zoning district. Additions will NOT result in an increase to the gross floor area by more than 50 percent (Historic Site)

Additions, and/or interior renovations will NOT exceed 100 percent of the assessed building value

Printed Name:

Signature: Printed Name:

#### DC WATER AND SEWER AUTHORITY OFFICER

Address:

Signature:

Signature:

DCRA STRUCTURAL

Thereby certify that this property is a municipal wastewater treatment facility operated by DC Water & Sewer Authority. This certification does not constitute an interpretation of zoning or building codes and does not entitle the applicant to any relief not authorized by zoning or building code officials pursuant to the applicable codes.

Dates

Date:

DCRA, 1100 4th Street, SW, Suite E650 Washington, DC 20024 phone 202-442-4400 fax 202-442-9445

## **Transition Period: No GAR**

- Building Permit Filed prior to October 1, 2013,
  - DCRA officially accepted as being complete.
- Building Permit Filed on or after October 1, 2013,
  - Unexpired approval, provided the vote to approve occurred prior to October 1, 2013,
    - A first stage, second stage, or consolidated planned unit development,
    - A variance, special exception, design review under the CG or SEFC overlay, or
    - A concept design by the Historic Preservation Review Board or Commission of Fine Arts.

## **Transition Period: No GAR**

- Building Permit Filed on or after October 1, 2013,
  - Unexpired approval granted after October 1, 2013, provided a public hearing occurred prior to October 1, 2013,
    - A variance, special exception, or design review under the CG or SEFC overlay.
  - Unexpired approval granted after October 1, 2013, provided a set down for a public hearing occurred prior to October 1, 2013,
    - A first stage, second stage, or consolidated planned unit development.

## **Exemption Form**

|   | APPLICATION FOR EXEMPTION STATUS<br>FROM D.C. ZONING REGULATION GREEN AREA RATIO   |
|---|--|
|   | BASED ON TRANSITION PERIOD FILING STATUS   |
|   | BASED ON TRANSITION TERIOD TEERO STATES  |
|   | request evidence of a transition period exemption from the Green Area Ratio (GAR) Chapter 34 of DCMR<br>for the proposed construction on the property identified below.  |
| ddress                                    |  |
| Square                                    | Lot  |
|   |  |
| llowab                                    | le Transition Period Exemptions (CHECK ONE):<br>Building Permit filed prior to October 1 <sup>st</sup> , 2013.   |
| -   | Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when   |
|   | vote to approve occurred before October 1", 2013.  |
| 2.3                                       | Unexpired approval of a variance, special exception, design review under the CG or SEFC overlay when   |
|   | vote to approve occurred before October 1 <sup>st</sup> , 2013.<br>Unexpired approval of a concept design by the Historic Preservation Review Board or Commission of   |
|   | Unexpired approval of a concept design by the Historic Preservation Review Board or Commission of<br>Fine Arts when vote to approve occurred before October 1 <sup>st</sup> , 2013.  |
| _   | Unexpired approval of a variance, special exception, design review under the CG or SEFC overlay when   |
|   | Unexpired approval of a variance, special exception, design review under the CG of SEFC overlay when a   |
|   | public hearing occurred before October 1st, 2013.  |
|   | public hearing occurred before October 1 <sup>47</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when   |
| IOTE W                                    | public hearing occurred before October 1 <sup>st</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when<br>public hearing occurred before October 1 <sup>st</sup> , 2013.   |
|   | public hearing occurred before October 1 <sup>47</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when   |
| nder th                                   | public hearing occurred before October 1 <sup>st</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when<br>public hearing occurred before October 1 <sup>st</sup> , 2013.<br>(hen impervious surface or lot occupancy is increased by 20 percent or mare, that increase is not covered<br>is exemption. The GAR is applied to the modification.   |
| nder th                                   | public hearing occurred before October 1 <sup>st</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when<br>public hearing occurred before October 1 <sup>st</sup> , 2013.<br>(hen impervious surface or lot occupancy is increased by 20 percent or mare, that increase is not covered<br>is exemption. The GAR is applied to the modification.   |
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| nder th<br>pplica                         | public hearing occurred before October 1 <sup>st</sup> , 2013.<br>Unexpired approval of a first stage, second stage, or consolidated planned unit development (PUD) when<br>public hearing occurred before October 1 <sup>st</sup> , 2013.<br>then impervious surface ar lot accupancy is increased by 20 percent or mare, that increase is not covered<br>is exemption. The GAR is applied to the modification.<br>It Telephone   |
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## Who has a GAR?

- All New Buildings that require a Certificate of Occupancy (C of O).
- Additions and Interior Renovations to existing buildings,
  - When the construction cost exceeds 100% of the assessed building value within any 12 month period.
  - A "historic resource" with a 50 percent (or more) increase to the gross floor area.

## Definitions...

- Addition and interior renovation of existing building structure
  - Extension or increase in floor area or height.
  - Alteration, renovation or repair to the interior of the existing structure.
- Assessed value of the building, not including the land value
  - Office of Tax and Revenue records.
  - Date of the building permit application.
- Construction cost for an addition, alteration, or repair
  - Amount indicated by the applicant in the building permit application (Contract Agreement Form).
- Historic resource is a building or structure,
  - Certified by the DC Inventory of Historic Sites or State Historic
     Preservation Officer .

- Is the project in a transition category?
- Have you hired a Landscape Expert?
- Are you asking for a BZA special exemption?
- Do you know the score for your zone?
- Design considerations,
  - Building footprint within lot.
  - Stormwater obligations.
  - Energy goals.
  - Green building standards.

#### • Is GAR required?

- Have you hired a Landscape Expert?
- Are you asking for a BZA special exception?
- Do you know the score for your zone?
- Design considerations,
  - Building footprint within lot.
  - Stormwater obligations.
  - Energy goals.
  - Green building standards.

- Is the project in a transition category?
- Have you hired a Landscape Expert?
- Are you asking for a BZA special exception?
- Do you know the score for your zone?
- Design considerations,
  - Building footprint within lot.
  - Stormwater obligations.
  - Energy goals.
  - Green building standards.

#### Who is a Landscape Expert?

- Certified Landscape Expert is:
  - Maryland or Virginia Licensed Landscape Architect
  - International Society of Arboriculture (ISA)
     Certified Arborist
  - Maryland certified Professional Horticulturist
  - Landscape Contractors Assoc. MD-DC-VA certified
     Landscape Technician

- Is the project in a transition category?
- Have you hired a Landscape Expert?
- Are you asking for a BZA special exception?
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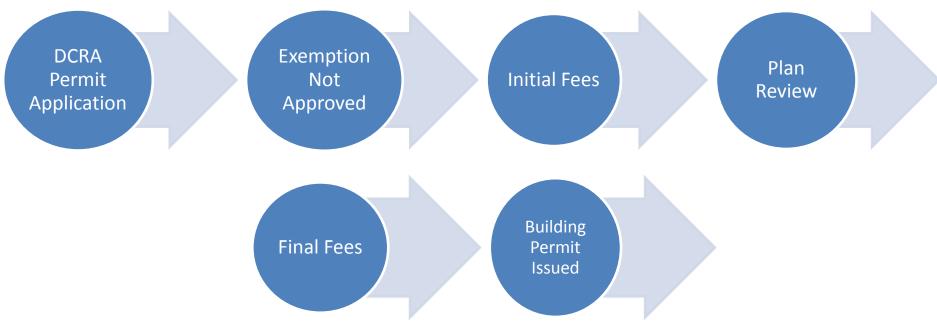
#### Helpful Link: propertyquest.dc.gov/

| PQ 1200 first st ne                  |                       | Ownership and Taxes        |   |  |  |
|--------------------------------------|-----------------------|----------------------------|---|--|--|
|                                      |                       | Tax lot                    | 0672 0856   |  |  |
| Basic Information                    |                       | Premises                   | 1200 1ST ST NE  |  |  |
| 1200 1ST STREET NE                   | the second            | Owner                      | VEF-VN CAPITOL PLAZA I LLC  |  |  |
| SSL (Square, Suffix & Lot) 0672 0856 |                       | 100.0                      | 5530 WISCONSIN AVE STE 1000   |  |  |
| Lot type                             | tax lot               | 1.1.1                      | CHEVY CHASE, MD 20815-4330  |  |  |
| Ward                                 | Ward 6                | Use                        | Commercial-Office-Large   |  |  |
| ANC                                  | ANC 6C                | Land area                  | 34405 square feet   |  |  |
| SMD                                  | SMD 6C06              | Tax class                  | Commercial, industrial  |  |  |
| Neighborhood Cluster                 | Cluster 25            | Tax rate                   | n/a   |  |  |
| Police District                      | Fifth Police District | Current assessment (2016)  |   |  |  |
| Police Service Area                  | PSA 501               | land                       | \$16 101 540  |  |  |
| Voting Precinct                      | Procinct 83           |                            | \$147,076,840   |  |  |
| Zoning                               | D-5                   | improvements               | a second contraction of the second |  |  |
| Downtown subarea                     | NoMa                  | total                      | \$163,178,380   |  |  |
| 2010 census tract                    | 106                   | Proposed assessment (2017) |   |  |  |
| 2010 census block group              | 2                     | land                       | \$16,101,540  |  |  |
| 2010 census block 2023               |                       | improvements               | \$136,528,090   |  |  |
| No historic resources noted.         |                       | total                      | \$152,629,630   |  |  |

|     |  |   | De   | evelopment Standa   | ards   |                  |         |                     |                                   |
|-----|--|---|--|---|--|------------------|---------|---------------------|-----------------------------------|
|     | Floor Area Ratio<br>(max.) <sup>1, 2</sup>   | Height (ft.) <sup>2</sup>   | Penthouse Height<br>(ft.)/Stories  | Lot Occupancy<br>(percentage) <sup>3</sup>                                      | Rear Setback (ft.)   | Side Setback (f  | .)      | Green Area<br>Ratio | Zoning<br>Regulation<br>Reference |
| D-5 | at least 90 ft.<br>but less than<br>120 ft ) | right-of-way of   | 20   |   |  |                  |         |                     |                                   |
|     |  |   |  | 2.5 in. per 1 ft. of<br>vertical distance<br>from the mean<br>finished grade at | lf provided, a<br>least 2 in. wid  |                  |         |                     |                                   |
|     |  | right-of-way of<br>at least 90 ft.<br>but less than                                       | ay of<br>0 ft.<br>han<br>.)<br>permitted for<br>penthouse<br>mechanical space<br>k or<br>ting<br>vithin<br>ric | 100   | the middle of the<br>rear of the<br>structure to the<br>highest point of<br>the main roof or | for each 1 ft. o | f<br>ng | 0.20                | Subtitle I,<br>Chapter 5          |
|     | 6.5 (non-<br>residential)                    | 90 (historic<br>landmark or<br>contributing<br>building within<br>a historic<br>district) |  |   | parapet, but not<br>less than 12 ft.   |                  |         |                     |                                   |

- Is the project in a transition category?
- Have you hired a Landscape Expert?
- Are you asking for a BZA special exception?
- Do you know the score for your zone?
- Design considerations,
  - Building footprint within lot.
  - Stormwater obligations.
  - Energy goals.
  - Green building standards.

#### Intake Process



#### **DOEE Review within DCRA Permit Process**

#### DOEE Stormwater Database (https://doee.dc.gov/swdb)

Provide site and plan information for DOEE review of DCRA permit applications for:

- Stormwater Management (SWMPs)
- Soil Erosion and Sediment Control (ESC)
- Green Area Ratio (GAR)

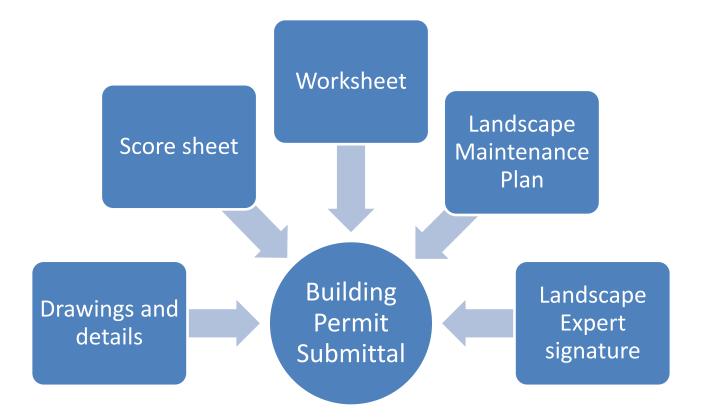
#### **Process - Development to Submittal**



Plans submitted to DCRA

## Plan submittals

• Synergy with stormwater plan submittals



#### Scoresheet & Worksheet

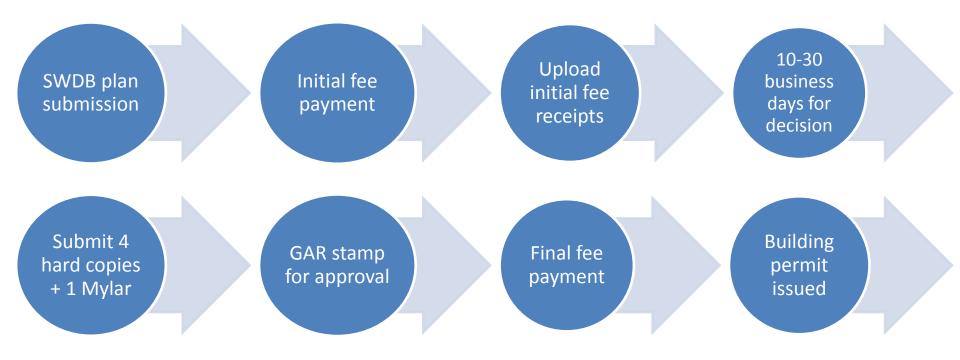
| ¢ | Adhea   | Green Area Ra               | iquare Zenin |
|---|---|-----------------------------|--------------|
|   |   |                             | -            |
| - |   |                             | it point     |
|   | Los dans (ansar inte scalar forsa) *  |                             | Index 1      |
|   | Landscoped parents  | Schern Lent.                | Letter.      |
|   | Landschood érine web a soil Seate china than 24°  | eritor en ft                | 0.5          |
|   | Landstraped stress with a soft density of 24° or granter  | induces fr                  | 44           |
|   | Novrienton facilities   | entire of f                 | 0.4          |
| 2 | Flawtings jernsfil for prants in lawforaged areas front Section Aj  |                             |              |
|   | Security or other plants has than 2 fail at matanity  | outro to ft                 | 0.3          |
|   | Flaens, not including presses, 2" or belier at meturity - calculated<br>in 9 as it per plant (typically planted no closer than 32" on center) | erritor muniture of starsts | 0.3          |
|   | The cappy for all mainteen 2.5° to 6° in classifier<br>or equivalent -parovieted at 20 og it per tree.  | emist mangber of types      | 0.5          |
|   | Time cappy for new times 1° discutor of larger<br>pressivalises - optimated to 200 optimative   | ention standbyr of brent    | 0.8          |
| į | Treat basic by for greasered (b) of equiling tree 6" to 12" in dilectory or larger<br>or equivalent - consultant in 224 by ht per treat       | instant pay of trans        | 0.7          |
|   | The cases py for greenvestion of easing the 12° to 10° to demoter or larger<br>or equivalent - calculated at 600 of h perform                 | entorsantier of bress       | 0.7          |
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|   | Vegetabel er "greet" reste  |                             |              |
|   | Groups basis 2" and from these \$" of groups in medium  | outer to A                  | 0.6          |
|   | Gueria: least if of growth middlem  | enter en fr                 | 0.8          |
|   | Furnishis Facing***   | print as p                  |              |
|   | Permatiple caving over as head 6" and lease than 24" of soil or growing   | 1.1.1 March 1.1.1           | 0.4          |
|   | Parroastie party pour at least 28" of cel or grand  | -0                          | 0.5          |
|   | Citier<br>Britanzat trea growth systems <sup>4++</sup>  | eviter en ft                | 0.4          |
|   |   | subscraft                   |              |
|   | Recently energy promotion   | poire ta ft                 | 0.5          |
| í | Reproved water faultures  | an-control of soft =        | 0.2          |
|   | Innes   |                             |              |
|   | Harting plant conclus   | etarie/                     | 0.3          |
|   | Landscaling in fixed cultivation  | eviter en fr                | 0.3          |
|   | fürsternet accommentar longetikin   | exterior by ft              | 0.1          |

| 1  |             |         | Quantity of                           | GAR Featu | res per Submit                        | fed Sheet      |       |
|----|-------------|---------|---------------------------------------|-----------|---------------------------------------|----------------|-------|
| -  |             | Sheet # | Sheet #                               | Sheet #   | keep adding col                       | umns as needed | TOTAL |
| At | square feel |         |                                       |           |                                       |                | 0     |
| A2 | square feel | -       |                                       |           | · · · · · · · ·                       |                | Ó.    |
| A3 | square feet |         |                                       |           |                                       |                | 0     |
| Bt | square feel |         |                                       |           | 1                                     |                | 0     |
| 82 | # of plants |         |                                       |           | · · · · · · · · ·                     |                | - 0 - |
| B3 | # af trees  |         | 1                                     |           |                                       |                | 0     |
| B4 | # of trees  |         | 1                                     |           | 1                                     |                | 0     |
| B5 | # of Inees  |         |                                       |           | · · · · · · · · · · · · · · · · · · · |                | 0     |
| B6 | # of trees  |         |                                       |           |                                       |                | 0     |
| 87 | # of trees  |         | 1                                     |           |                                       |                | 1.0   |
| B8 | # of trees  |         |                                       |           |                                       |                | 0     |
| 89 | square feet |         |                                       |           |                                       |                | 8     |
| CI | square feet |         | 1                                     |           |                                       |                | 0     |
| C2 | aquare feet |         | · · · · · · · · · · · · · · · · · · · | -         | 5. Inc. 244                           |                | 0     |
| DI | square feet |         |                                       | 1         |                                       |                | 0     |
| 02 | square feet |         | 1                                     | 1         |                                       |                | Q     |
| Ef | square feet |         | 1                                     |           |                                       |                |       |
| E2 | square feet |         |                                       |           | 211                                   |                | 0     |
| E3 | àquare feet |         |                                       | 1         | 0 = 0                                 | 41.1           | 0     |
| HI | square feet |         |                                       | -         |                                       |                | - 0   |
| H2 | square feet | -       |                                       |           | 2-54                                  |                | a     |
| H3 | square feet |         | 1                                     | 1         | *                                     |                | 0     |

\* See Green Area Ratio Scoresheet for category definitions

\*\* Enter lotals on the Green Area Ratio Scoresheet

#### **DOEE Plan Review**



#### Fees

| Payment Type | Payment Requirement                  | Fees by Land Disturbance Type<br>or Building Footprint |             |  |  |
|--------------|--------------------------------------|--|-------------|--|--|
| rayment type | rayment nequirement                  | ≤10,000 ft²  | ≥10,000 ft² |  |  |
| Initial      | Due upon filing for building permit  | \$587.64   | \$868.69    |  |  |
| Final        | Due before building permit is issued | \$127.75   | \$204.40    |  |  |
| Supplemental | For reviews after first resubmission | \$510.99   |             |  |  |

DDOE Stormwater Management Regulations - Chapter 5, DCMR Title 21 § 501.10

Fees adjusted annually for inflation - Fees above effective February 5, 2016

## **Plan Revisions After Approval**

An additional review is required if:

Reduce plant quantity

Change location of landscape element

Species substitution

Decrease in GAR score

## Process – Approval to C of O

DDOE reviews and approves the GAR Plan

CLE confirms installation of GAR landscape elements

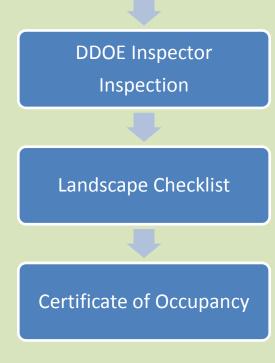
CLE / DDOE inspect site and sign Landscape Checklist

OZA receives Landscape Checklist and issues C of O

Property Owner maintains GAR landscape elements

# Construction

Landscape Expert confirms installation as per plan



|   | + |  |  |
|---|---|--|--|
| - | - |  |  |
|   |   |  |  |



GOVERNMENT OF THE DISTRICT OF COLUMBIA DISTRICT DEPARTMENT OF ENVIRONMENT WATERSHED PROTECTION DIVISION/INSPECTION & ENFORCEMENT BRANCH Green Area Ratio - Landscape Checklist

| _                    | m a Certified   | Landscape Expert.   | as defined in DCN   | R Title 11, Chapter 34, responsible  | e for confirmine  |
|----------------------|---|---|---|--|---|
| install              |   | proved landscape  |   |  |   |
|                      |   |   |   | , Washington, DC, and develo   | oped pursuant to:                                       |
|                      | Street Add  | ress (Printed)  |   |  |   |
|                      | Building Pe   | rmit Number   | DDOE Plan   | Number   |   |
|                      | Ward  | Lot   | Square  | -  |   |
| <b>D</b> A           |   |   |   | and the second sec |   |
| •                    |   |   |   | submitted to the property owner.<br>District of Columbia that the follow   |   |
| I diecla             | ire under pena  |   | r the laws of the l   |  |   |
| A I diecla<br>Signat | ure under pena<br>ure of Certifie<br>If any landsca<br>revised landsi | ity of perjury unde<br>d Landscape Exper<br>upe elements have | r the laws of the l<br>rt Cer<br>been changed dw<br>approved by the | District of Columbia that the follow<br>tification/Registration Number<br>ring installation, DO NOT SIGN DR S<br>District Department of Environmer   | ing is true and correc<br>Date<br>SUBMIT this checklist |

# Temporary Certificate of Occupancy

- Apply to Office of Zoning Administrator
- Granted only twice, each time for 4 months.
- Considered under the following conditions:



# **Post-Construction Maintenance**

Property owner responsible after granted Certificate of Occupancy

Follow landscape maintenance plan provided by Landscape Expert

Must maintain GAR score

GAR plan submittal to DCRA not required after Landscape Checklist signed-off

### SOILS AND AMENDMENTS

### Seasonal application

Mulch – Apply yearly or as necessary to replace decomposed mulch. Compost – Apply compost yearly at 1–2 inch depth. Coarse textured sand and clay soils require greater compost addition than loamy soils. The organic matter content of the chosen compost will determine the depth applied

Fertilizer – If choosing to apply fertilizer, perform a soil test for nutrient levels only after incorporating compost into topsoil. This will avoid over-application of nutrients, as compost itself will increase the nutrient content.

### Material source

Compost should be well-decomposed material, stable, free of weeds, contaminants and foul odors. Compost may be derived from yard waste (decomposed leaves, grass clippings, TREES AND SHRUBS branches) or food waste.

Mulch can be derived from organic sources such as shredded bark, or leaf mulch.

### BIORETENTION

### **Maintenance Tasks** Frequency

Upon establishment

For the first 6 months following construction, the practice and CDA should be inspected at during pruning activities in any year. least twice after storm events that exceed 1/2 inch of rainfall. Conduct any needed repairs Spread mulch to 2-4 inch depth.

or stabilization. Inspectors should look for bare or eroding areas in the contributing drainage area or

around the bioretention area cover. ertili One-time, spot Watering is needed once a week during the first z mo

growing season (April-October), depending on rainfall.

rejuvenated growth. Remove and replace dead plants. Up to 10% of the plant stock may die off in the first year, Spread mulch at a maximum 2-inch depth. so construction contracts should include a care and replacement warranty to ensure that TURFGRASS vegetation is properly established Test soil for pH and apply lime only as necessary.

At least 4 times per year germination. Never mow more than one third of the grass height. Mow grass filter strips and bioretention with turf cover Leaving grass clippings in-place after mowing requires less fertilizer Check curb cuts and inlets for accumulated grit, leaves, and debris that may block inflow application. Regularly monitor and over-seed bare spots to prevent weed

Twice during growing season Spot weed and mulch

### Annually

Conduct a maintenance inspection Supplement mulch in devoid areas to 3" depth Prune trees and shrubs Remove sediment in pre-treatment cells and inflow points

### Once every 2–3 years

Remove sediment in pretreatment cells and inflow oints

### As needed

- Add reinforcement planting to maintain desired vegetation density
- Remove invasive plants using recommended control measures
- Remove any dead or diseased plants
- Stabilize the contributing drainage area to prevent erosion

### LANDSCAPE AREAS ALL PLANTINGS

Provide supplemental watering if rainfall is less than 1 inch per week during the first two growing seasons.

Conduct weeding as necessary to reduce competition between weeds and new plantings for nutrients, soil moisture, and sunlight. Replace mulch as necessary to reduce competition for available moisture and nutrients.

Monitor the plantings for disease or stress and modify cultural practice as necessary. Employ an integrated pest management (IPM) approach if possible.

Remove dead plant material and replant in the next appropriate growing season.

establishment.

Living Facades

needs.

Living Walls

VEGETATED WALLS

vegetation or debris.

integrity of wall tie-ins.

For trees, install slow leak watering bags or tree buckets during the first two growing seasons and water as necessary to supplement precipitation if less than 1 inch per week.

Inspect trees for signs of dead, diseased, or crossing branches and prune accordingly. Remove hazard limbs especially from

established trees. Never remove more than 20% of the tree canopy

Maintain the health of the tree by limiting all grade changes and other soil disturbance underneath the tree's Critical Root Zone.



Maintain turfgrass at an increased height to reduce weed

In late fall, core aerate and topdress with organic matter.

Periodically inspect roof gutters and drains for clogging with

Cable systems may require re-tensioning or inspection of the

Schedule regular plant maintenance during establishment and

ongoing growth. Inspect the plants for signs of disease, weed

competition, training along the support structure, and pruning

When using harvested stormwater irrigation, valves and fertilizer injectors should be checked for function, and the irrigation pipes checked for leaks. Schedule frequent irrigation inspections. Drip irrigation emitters should be checked during operation to ensure water is being delivered to all panels. Winterize irrigation systems as per the irrigation specification. Schedule regular plant maintenance during establishment and ongoing growth. Inspect the vegetated wall for signs of disease, inadequate irrigation, and erosion.

### HARVESTED STORMWATER IRRIGATION Cistern

The cistern must be cleaned yearly. To clean, use a submersible pump to remove the water. Brush walls with a hard bristle brush or use a high pressure cleaner.

Purpose of the maintenance is to remove the sediment that inevitably deposits on the cistern's floor and which may give rise to parasitic fermentation and odor. The rate at which the sediment accumulates depends on the region's atmospheric pollution (for dust) the roof type and the quality of the set-up

tora

cd hpartment.

of gutter's

nam downspout and the sedimentation basin will substantially delay the accumulation of sediment in the barrel or cistern. Additionally, a sedimentation basin equipped with an appropriate trapped overflow that prevents the passage of floating impurities can work. Filters need to be cleaned monthly. Cisterns and rain barrels should be dewatered often to ensure available volume on the onset of rain events.

ie listern s

### Irrigation

t<u>re</u>am frem)

nter p lced

he mesh

Conduct frequent inspections to verify integrity of irrigation system.

Periodically review the pressure regulators, filters, controller, sensors, valves, sprinkler heads and other system components to verify they meet original design criteria for efficient operation and uniform water distribution.

Ensure that replacement hardware used for system repairs matches the existing hardware, and is in accordance with the design. Ensure that system modifications are in keeping with design specifications and do not cause water demand to exceed the system's hydraulic capacity. Winterize irrigation systems and re-establish operation in the spring.

Individual vegetated panels from living walls should be removed to inspect the wall and support structures for drainage and anchorage issues. Clean all drains and gutters yearly.

# **RELATED REGULATIONS**

# GAR & Stormwater Overlap

# **Green Area Ratio Rule**

- DCMR Chapter 34
- Requires a C of O
- No Maintenance Covenant
- Interior Renovations:
  - 100% construction cost trigger
- Area Calculations
- Design constraints maximizes healthy vegetation

# **Stormwater Rule**

- DCMR Chapter 21
- Includes Public Right of Way
- Unrelated to C of O
- Maintenance Covenant Required
- Interior Renovations:
  - 50% construction cost trigger
- Volume Calculations
- Contributing Drainage Area
- Design constraints maximizes stormwater retention

Overlap: to achieve stormwater environmental benefits Landscape Elements often the same practices as LID BMPs

# LID BMPs vs Landscape Elements

| Stormwater Best Management Practices | Landscape Elements                   |
|--------------------------------------|--------------------------------------|
| Bioretention                         | Only considers practice area         |
| Vegetated Roofs (green roofs)        | Assigns greater value based on depth |
| Permeable Paving                     | Only considers practice area         |
| Rainwater Harvesting                 | Limited to irrigation                |
| Tree Canopy (new and preserved)      | Higher value, more variability       |
| Land abstraction not a BMP           | Ground cover plantings               |
| May improve BMP or land abstraction  | Soil depth for landscaping           |
| Is it receiving stormwater runoff?   | Green Walls                          |
| Is it receiving stormwater runoff?   | Enhanced tree growth systems         |
| Suggested not required               | Native planting rewarded in scoring  |
| Not considered                       | Food cultivation                     |
| Not consider unless a harvest demand | Water feature                        |
| Not considered                       | Renewable energy                     |



Pervious surface requirements Landscaping for parking lots

# **RELATED ZONING REQUIREMENTS**



# **Pervious Surface Requirements**

- In zones R-1 through R-4
- Applies when increasing existing lot occupancy by 10%+ or 25%+ for historic structures
- Pervious = grass; mulched groundcover; plants; trees; permeable pavers; and decks or porches

| ZONE DISTRICT AND STRUCTURE                                | MINIMUM PERCENTAGE<br>OF PERVIOUS SURFACE |
|--|---|
| R-1 through R-4<br>Public recreation and community centers | 30%                                       |
| R-1-A, R-1-B<br>All other structures                       | 50%                                       |
| R-2<br>All other structures                                | 30%                                       |
| R-3<br>All other structures                                | 20%                                       |

# Landscaping for Surface Parking

- Minimum 10% of lot landscaped
- Landscape end islands of 9+ spaces
- Trees must be min. 2.5" dbh at planting
- Plant 4' from protective barriers
- Special exceptions if impracticable







# LANDSCAPE ELEMENTS & & GUIDEBOOK REVISIONS

# **Proposed Guidebook Changes**

- Incorporate new regulations
- Clarify standards for design, scoring, and submittal
- Improve efficiency for plan review and inspection processes
- Clarify errors and omissions
- Incorporate prior/future feedback from stakeholders, DOEE, OZA, and OP

# **Public Comment Process**

- Solicit input through public meetings and incorporate feedback
- Review by OZA, OP, and DOEE
- Notice in DC Register; revised Guidebook to be posted on DOEE website
- Public feedback through DOEE website
- Finalized Guidebook posted to DOEE website

doee.dc.gov/gar

# ZRR – Revisions to GAR

- DCMR Chapter 6
- Different zone districts
- New trees credited by mature tree canopy
- Vegetated wall credited by vertical surface
- Expanded invasive species lists

# Landscape Soils

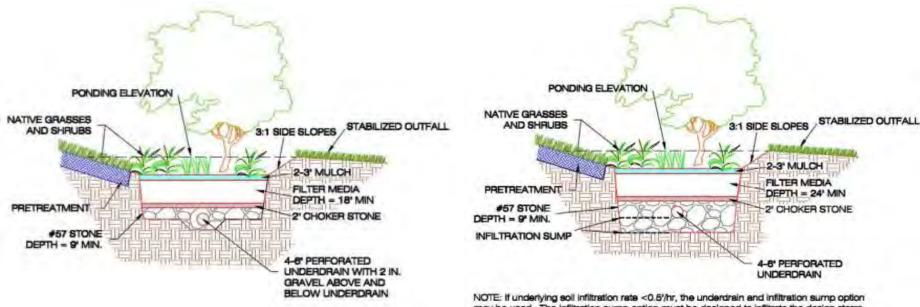
| Soils < 2-foot depth            |   |  |
|---------------------------------|---|--|
| Previous Proposed               |   |  |
| Credited for areas beneath turf | Credited for planted areas without trees or vegetated walls |  |



| Soils > 2-foot depth                                   |   |  |
|--|---|--|
| Previous   | Proposed  |  |
| Credits all areas beneath ornamental beds              | Only trees and vegetated walls may be credited under this category and must provide minimum soil volume |  |
| Credits all areas with soils preserved from compaction | - this category and must provide minimum son volumes  |  |

# **Bioretention**

| Previous   | Proposed  |
|--|---|
| Credit the area of filter bed (side slopes to be credited under "landscape soils") | same  |
| Native plant species recommended   |   |
|  | Projects without SWMPs to follow SWM Guidebook design standards |



may be used. The inflitration sump option must be designed to inflitrate the design storm volume in less than 72 hours.

# Groundcovers and Plants > 2-Foot Height

| Groundcovers          |          |  |
|-----------------------|----------|--|
| Currently             | Proposed |  |
| Credited by mature sf | Same     |  |

| Plants > 2-foot height   |   |  |
|--|---|--|
| Currently  | Proposed  |  |
| Shrubs and Herbaceous quantity credited on a one-<br>for-one basin as shown on plan – 9 sf per plant | Same  |  |
| No Trees credited  | Trees with less than 400 cf of soil volume or are less than minimum size are credited |  |

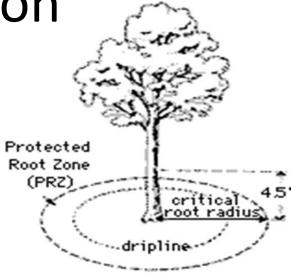
# New Tree Plantings

| Previous                             | Proposed                                      |
|--------------------------------------|---|
| Credit by caliper size               | Credit by canopy spread                       |
| Minimum tree size (2.5 inch caliper) | 1.5 inch caliper , 8-foot height (multi-stem) |
| Minimum spacing requirements         | Minimum soil volume requirements              |
|                                      | Tree ≤ 40 foot (400-600 cf min soil volume)   |
|                                      | Tree > 40 foot (1000 -1500 cf soil volume)    |

| Green  | Equivalent Square                |     |
|--|----------------------------------|-----|
|  | Footage                          |     |
|  | (ft <sup>2</sup> per plant/tree) |     |
| Previous Current   |                                  |     |
| Trees 2.5 – 6 inch caliper New tree canopy with mature spread ≤ 40-feet      |                                  | 50  |
| Trees 6 – 12 inch diameter New tree canopy with mature spread > than 40-feet |                                  | 250 |

# **Tree Preservation**

| Current   | Proposed    |
|---|-------------|
| Protect Critical Root Zone (CRZ) or dripline          | Protect CRZ |
| Credit by DBH if CRZ is protected                     |             |
| Tree survey showing location, species, condition      | same        |
| Tree preservation plan for all stages of construction |             |



| Green Area Ratio Landscape Elements                               | Equivalent Square Footage        |  |  |
|---|----------------------------------|--|--|
|   | (ft <sup>2</sup> per plant/tree) |  |  |
| Tree canopy for trees 2.5-6 inches in diameter                    | <del>50</del>                    |  |  |
| Tree canopy for preserved trees 6–12 inches in diameter           | 250                              |  |  |
| Tree canopy for preserved trees 12–18 inches in diameter          | 600                              |  |  |
| Tree canopy for preserved trees 18–24 inches in diameter          | 1,300                            |  |  |
| Tree canopy for preserved trees larger than 24 inches in diameter | 2,000                            |  |  |



# **Vegetated Walls**

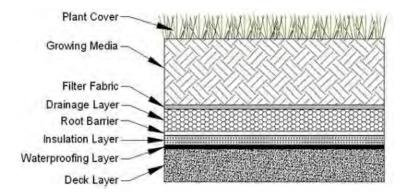
| Previous                    | Proposed  |
|-----------------------------|---|
| Credited by ground coverage | Credited by vertical coverage                       |
| Soil width - 1 ft. minimum  | Soil volume - 1 cf / 10sf of credited wall coverage |

# Sample of proposed GAR plant list

| Scientific Name                         | Common Name              | Max. Height<br>(ft.) | Attachment       | Sun / Shade   | Native | Notes |
|---|--------------------------|----------------------|------------------|---------------|--------|-------|
| Actinidia polygama                      | Silver Vine              | 10-15                | Twining          | Sun / partial |        |       |
| Aristolochia macrophylla (A.<br>durior) | Dutchman's Pipe          | 20-30                | Twining          | Sun / partial | х      |       |
| Bignonia capreolata                     | Crossvine                | 30-50                | Clinging/Twining | Sun / partial | х      |       |
| Campsis radicans                        | Common<br>Trumpetcreeper | 30-40                | Clinging         | Sun / partial | х      |       |



# Green Roof



| Previous   | Proposed  |
|--|---|
| Depth = soil media + drainage layer (water retention)  | Depth = soil media only   |
| No container plantings   | Container plantings over structure credited                                   |
| Undefined planting design standards  | Plant type by soil media depth and irrigation provided                        |
| Undefined irrigation standards   | Permanent irrigation needs dependent upon specified plant type and % coverage |
| Multiplier accounts for soil media + groundcover<br>vegetation – Plants > 2-foot credited separately | Same  |

# Green Roof Plant Coverage Guidelines

|             | Green roof coverage for plant species         |  | Credited categories |                          |            |
|-------------|---|--|---------------------|--------------------------|------------|
| Soil media  | No permanent irrigation                       | Permanent irrigation                             | Native              | Groundcover              | Plant > 2' |
| depth       |   |  | (H1.)               | (B1.)                    | (B2.)      |
| 2–4" soil   | Succulents<br>Non-succulents (≤10% cover)     | Succulents<br>Non-succulents (≤10% cover)        | 30% max.            |                          |            |
| 4–8" soil   | Succulents-Grasses-<br>Herbaceous             | Succulents-Grasses-<br>Herbaceous                | 50% max.            |                          | No         |
|             | Non-succulents (≤30% cover)                   |  |                     | No                       |            |
| 8–12" soil  | Succulents-Grasses-<br>Herbaceous             | Succulents-Grasses-<br>Herbaceous - Small shrubs |                     | (Included in green roof) |            |
| 12–24" soil | Grasses-Herbaceous<br>Succulents (≤10% cover) | Succulents-Grasses-<br>Herbaceous-Shrubs         | 100% max.           |                          | Yes        |
| 24"+ soil   |   | Succulents-Grasses-<br>Herbaceous-Shrubs-Trees   |                     |                          |            |

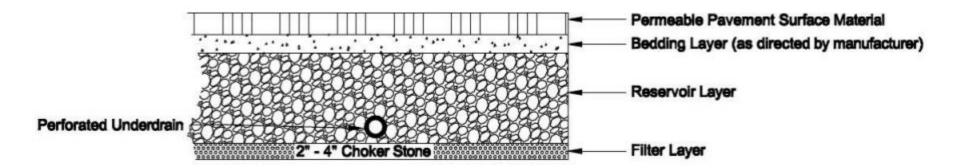
# Permeable Pavement

| Current  | Proposed  |
|--|---|
| Area of pavers with reservoir layer beneath  |   |
| Cannot credit > 33% of GAR score<br>(total for perm. pavement and enhanced tree<br>growth) | same  |
| Depth of gravel or stabilized soil   | Gravel and soil alone are not credited  |
|  | Projects without SWMPs require: follow SWM<br>Guidebook design requirements (Ch. 3.5) |



# Permeable Pavement

| Current  | Proposed  |
|--|---|
| Area of pavers with reservoir layer beneath  |   |
| Cannot credit > 33% of GAR score<br>(total for perm. pavement and enhanced tree<br>growth) | same  |
| Depth of gravel or stabilized soil   | Gravel and soil alone are not credited  |
|  | Projects without SWMPs require: follow SWM<br>Guidebook design requirements (Ch. 3.5) |

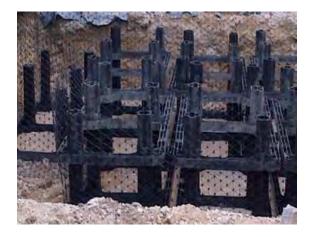


# Enhanced Tree Growth Systems

| Current  | Proposed   |
|--|--|
| Area of soil with structural capacity and located beneath pavers   | Same   |
| Cannot credit > 33% of GAR score<br>(total for perm. pavement and enhanced<br>tree growth)                   | (see Ch. 3.6 "Bioretention,"<br>engineered tree boxes, of<br>the SWM Guidebook for<br>design strategy) |
| Depth of soil media – 2 feet minimum   |  |
| Soil media may be credited to both<br>permeable pavers and enhanced tree<br>growth to provide stacked credit |  |
|  | Can contribute to soil volume requirements   |



Credit: Cornell University



# **Renewable Energy**

| Current   | Proposed |
|---|----------|
| Solar photovoltaic and solar thermal                    |          |
| Credit provided to area of array                        | same     |
| Schematic plan for<br>electrical or plumbing<br>systems |          |



# Water Features

| Current   | Proposed |
|---|----------|
| Area of water feature to be under water ≥ 6 months per year |          |
| Harvested rainwater to provide ≥ 50% of water supply        | same     |

# **Bonus Elements**

- Bonus provided to existing credited elements through additional 0.1 multiplier
- Are additions to credits, not replacements

| Bonus element                  | Bonus multiplier added to these elements                                      |
|--------------------------------|---|
| Native plants                  | New and existing plantings, tree preservation, vegetated wall, vegetated roof |
| Food cultivation               | New and existing plantings, vegetated wall, vegetated roof                    |
| Harvested rainwater irrigation | Landscape soils, new and existing plantings, vegetated wall, vegetated roof   |

# **Invasive Species Lists**

# **Currently:**

- Plant Invaders of Mid-Atlantic Natural Areas
  - <u>http://www.nps.gov/plants/alien/pubs/midatlantic/</u>

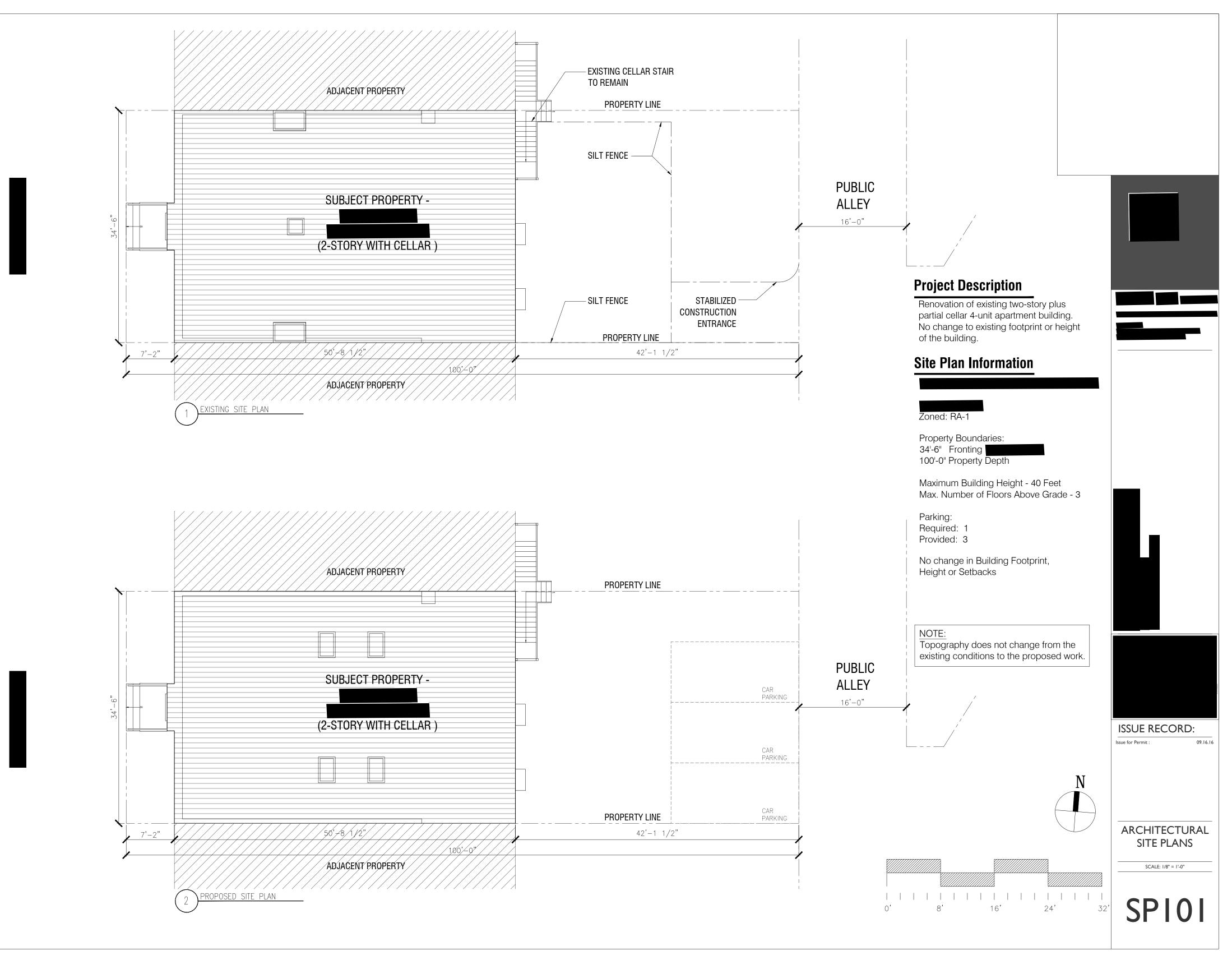
# **Under Consideration:**

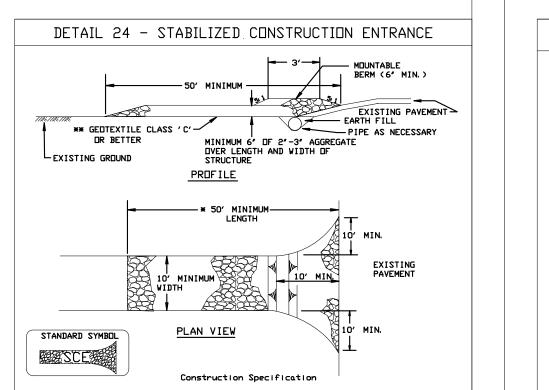
- Mid-Atlantic Exotic Pest Plant Council Plant List
- Virginia Invasive Plant Species List

# **Questions & Answers**

For additional information: ddoe.dc.gov/GAR

# Examples





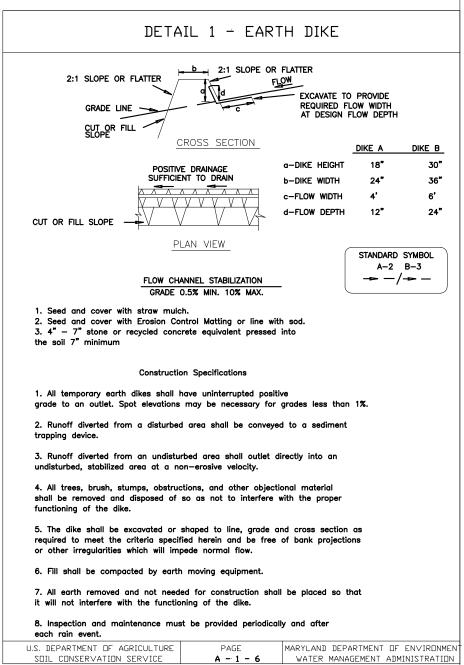
1. Length - minimum of 50' (\*30' for single residence lot). 2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. \*\*The plan approval authority may not require single family residences to use geotextile.

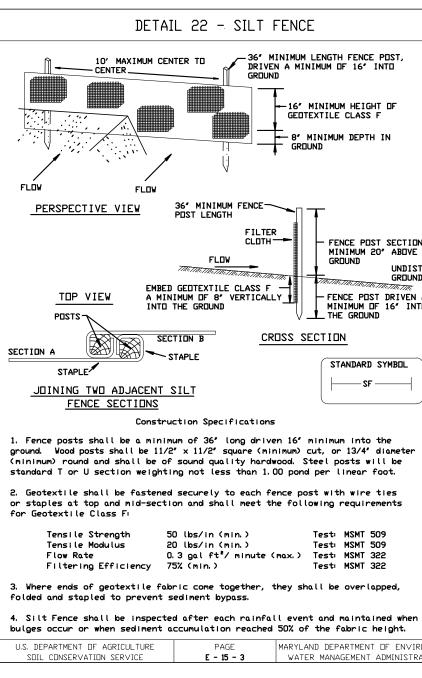
4. Stone - crushed aggregate (2' to 3') or reclaimed or recycled concrete equivalent shall be placed at least 6' deep over the length and width of the entrance.

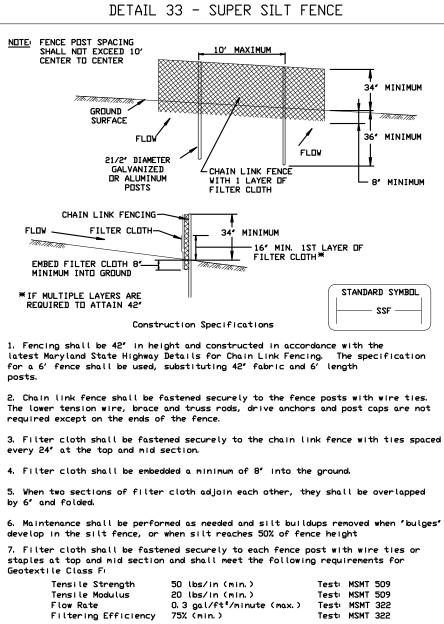
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6' minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance. U.S. DEPARTMENT DF AGRICULTURE MARYLAND DEPARTMENT OF ENVIRONMENT PAGE SOIL CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION F - 17 - 3



SDIL CONSERVATION SERVICE





|        |   | Filtering Efficiency           | 75% (min.) |          | Test: MSMT |                |
|--------|---|--------------------------------|------------|----------|------------|----------------|
| RONMEN | - | U.S. DEPARTMENT DF AGRICULTURE | PAGE       | MARYLAND | DEPARTMENT | OF EN∨IRONMENT |
| ATION  |   | SDIL CONSERVATION SERVICE      | H - 26 - 3 | WATER    | MANAGEMENT | ADMINISTRATION |
|        |   |                                |            |          |            |                |

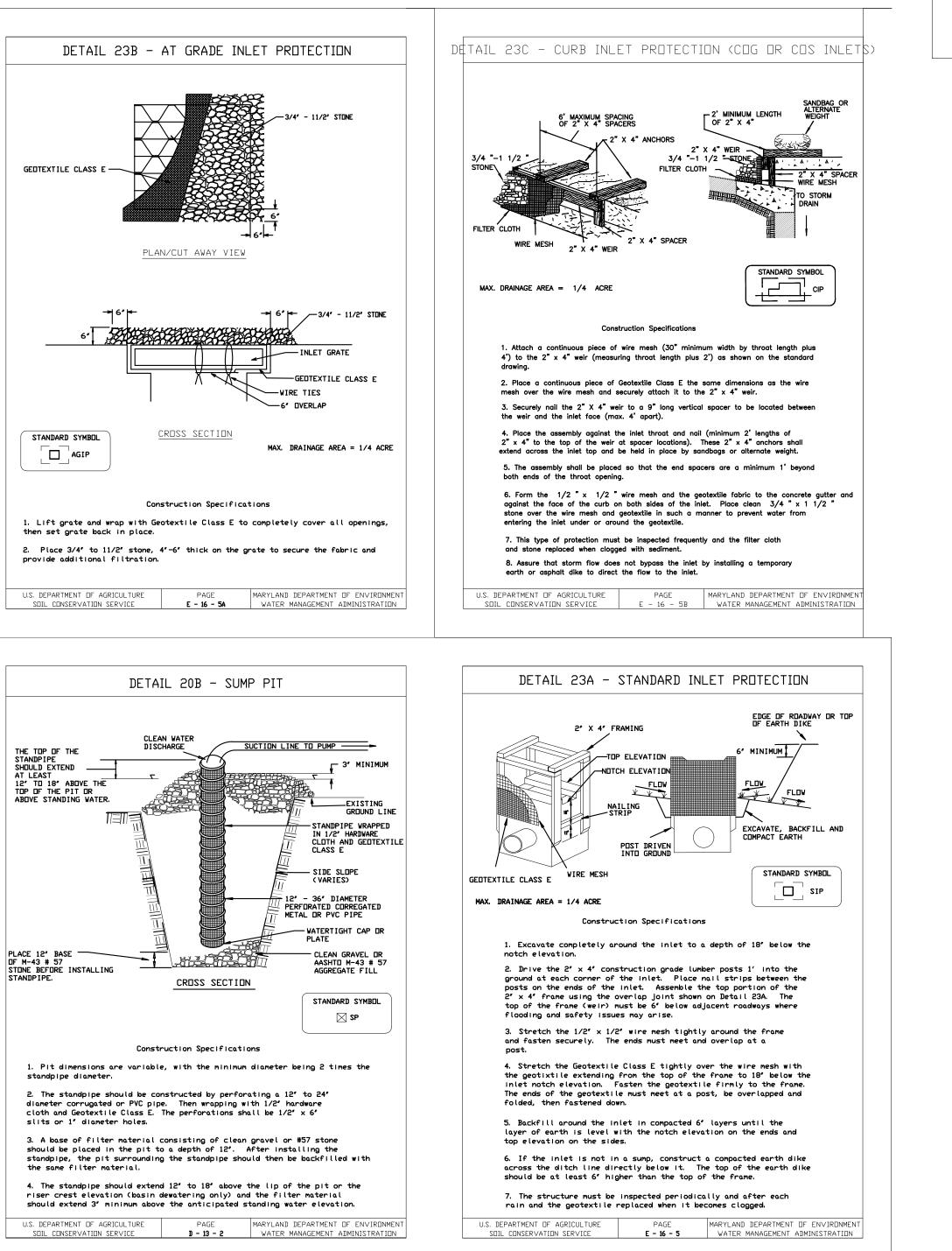
|  | DUST CONT  | ΈΩΙ  |
|--|--|--|
|  | DEFINITION<br>CONTROLLING DUST BLOWING AND MOVEMENT ON CONSTRUCTION SITES AN   |  |
| DST,<br>TD                               | PURPOSE<br>TO PREVENT BLOWING AND MOVEMENT OF DUST FROM EXPOSED SOIL SURFA   |  |
|  | AND IMPROVE TRAFFIC SAFETY.  |  |
| DF                                       | CONDITIONS WHERE PRACTICE APPLIES  |  |
| N  | THIS PRACTICE IS APPLICABLE TO AREAS SUBJECT TO DUST BLOWING AND N<br>TREATMENT.   | IOVEMENT WHERE ON AND OFF-SITE DAMAGE IS LIKELY WITHOUT  |
|  | SPECIFICATIONS   |  |
|  | TEMPORARY METHODS  |  |
| SECTION                                  | 1. MULCHES - SEE STANDARDS FDR VEGETATIVE STABILIZATION WITH MULCH<br>BLOWING.   | IES ONLY. MULCH SHOULD BE CRIMPED OS TACKED TO PREVENT   |
|  | 2. VEGETATIVE COVER- SEE STANDARDS FOR TEMPORARY -VEGETATIVE COVE  | R.   |
| GREUND<br>GREUND<br>DRIVEN A<br>16' INTE | 3. TILLAGE - TO ROUGHEN SURFACE AND BRING CLODS TO THE SURFACE. TH<br>BEFORE SOIL BLOWING STARTS. BEGIN PLOWING ON WINDWARD SIDE OF SIT<br>TOOTHED HARROWS. AND SIMILAR PLOWS ARE EXAMPLES OF EQUIPMENT W  | E. CHISEL-TYPE PLOWS SPACED ABOUT 12' APART, SPRING  |
|  | 4. IRRIGATION - THIS IS GENERALLY DONE AS AN EMERGENCY TREATMENT. S<br>REPEAT AS NEEDED. AT NO TIME SHOULD THE SITE BE IRRIGATED TO THE PO   |  |
|  | 5. BARRIERS - SOLID BOARD FENCES. SILT FENCES. SNOW FENCES, BURLAP F<br>TO CONTROL AIR CURRENTS AND SOIL BLOWING. BARRIERS PLACED AT RIC<br>10 TIMES THEIR HEIGHT ARE EFFECTIVE IN CONTROLLING SOIL BLOWING.   |  |
|  | 6. CALCIUM CHLORIDE - APPLY AT RATES THAT WILL KEEP SURFACE MOIST. I   | MAY NEED RE-TREATMENT.   |
| ameter                                   | PERMANENT METHODS  |  |
| be<br>ot.<br>es                          | I. PERMANENT VEGETATION - SEE STANDARDS FDR PERMANENT VEGETATIVE<br>TREES OR LARGE SHRUBS MAY AFFORD VALUABLE PROTECTION IF LEFT IN PL   |  |
| nts                                      | 2. TOP SOILING - COVERING WITH LESS EROSIVE SOIL MATERIALS. SEE STAND<br>3. STONE - COVER SURFACE WITH CRUSHED STONE OR COURSE GRAVEL.   | DARDS FOR TOP SOILING.   |
|  | REFERENCES   |  |
|  | I. AGRICULTURE HANDBOOK 346. WIND EROSION FORCES IN THE UNITED STA   | TES AND THEIR USE IN PREDICTING SOIL LOSS.   |
| ed,                                      | 2. AGRICULTURE INFORMATION BULLETIN 354. HOW TO CONTROL WIND ERC   | ISION, USDA-ARS  |
| d when<br>Ight.                          |  |  |
| F EN∨IRDNMENT<br>MINISTRATION            | EROSION AND SEDIMENT CONTROL NOTES   | SEDIMENT CONTROL NARRATIVE   |
|  | <ol> <li>ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE<br/>INSTALLED BEFORE THE START OF ANT EXCAVATION AND/OR<br/>CONSTRUCTION AS PER STANDARDS AND-SPECIFICATIONS FOR<br/>SOIL EROSION AND SEDIMENT CONTROL FOR THE DISTRICT OF<br/>COLUMBIA, IF AN ON-SITE INSPECTION REVEALS FURTHER<br/>EROSION CONTROL MEASURES ARE NECESSARY, THE SAME SHALL<br/>BE PROVIDED.</li> <li>ALL SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND<br/>MUNICIPUED IN CONTROL MEASURES WITH THE MOOT DESCRIPTION</li> </ol> | PROJECT DESCRIPTION<br>THIS PROJECT PROPOSES TO RENOVATE AND ADD ON TO AN<br>EXISTING SINGLE FAMILY HOME ON A LOT APPROXIMATELY 9,279 SF<br>IN SIZE.<br>EXISTING SITE CONDITIONS<br>THE LOT SLOPES AWAY FROM SOUTH TO NORTH TOWARD WHITTIER<br>STREET. |
|  | MAINTAINED IN CONFORMANCE WITH THE MOST RECENT EDITION<br>Of THE D.C. EROSION AND SEDIMENT CONTROL HANDBOOK.<br>3. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT<br>CONTROL STRUCTURES MUST BE PROVIDED TO INSURE INTENDED   | ADJACENT AREAS<br>THIS NEIGHBORHOOD IS A RESIDENTIAL AREA, THIS PARTICULAR<br>LOT IS SOUNDED ON THE SOUTH BY ANOTHER HOME, NORTH BY  |
| MINIMUM                                  | PURPOSE IS ACCOMPLISHED. THE SEDIMENT CONTROL<br>INSPECTOR REPRESENTING THE DISTRICT OF COLUMBIA SHALL   | WHITTIER STREET, EAST BY FIRST STREET AND WEST BY AN<br>UNIMPROVED PUBLIC ALLEY.   |
| MINIMUM                                  | MAINTAIN THE AUTHORITY TO REQUIRE ADDITIONAL SEDIMENT<br>CONTROL MEASURES AS NECESSARY TO PREVENT THE INTRUSION  | OFF-SITE AREAS   |
| MINIMUM                                  | OF SEDIMENT INTO STORM DRAIN SYSTEMS OR PUBLIC SPACE,<br>4. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS WILL BE<br>PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS, A  | THERE IS NO ANTICIPATED NEED FOR A SPOIL/BORROW SITE. IF ONE<br>SHOULD BE REQUIRED, A SITE WILL BE LOCATED DURING<br>CONSTRUCTION, BASED ON THE STATUS OF OTHER CONSTRUCTION   |
| MINIMUM                                  | VEHICLE WASH AREA SHALL BE PROVIDED ON-SITE, THE AREA<br>MAY BE CONSTRUCTED OF RUBBLE OR OTHER HARD POROUS<br>MATERIAL. A WORKING WATER HOSE MUST BE LOCATED IN THE<br>AREA DURING ALL CONSTRUCTION ACTIVITY.  | SITES IN THE VICINITY.<br>SOILS<br>ON-SITE SOILS ARE CLASSIFIED AS Sassafras-Urban Land Complex  |
|  | 5. SILT REMOVED FROM TRAPS SHALL BE PLACED AND STABILIZED ON<br>DESIGNATED AREAS ON-SITE IN SUCH A MANNER THAT IT DOES<br>NOT FOUL EXISTING OR PROPOSED STORM DRAINAGE SYSTEMS OR  | (SgC) BY THE USDA SOIL SURVEY OF THE DISTRICT OF COLUMBIA.<br>THESE SOILS ARE GENERALLY WELL DRAINED SILT LOAMS.   |
| SYMBOL                                   | AREAS ALREADY STABILIZED,<br>6. ALL WATER PUMPED FROM EXCAVATION DURING CONSTRUCTION   | CRITICAL AREAS<br>NONE EXIST ON THIS SITE.   |
| fication                                 | <ul> <li>SHALL BE PUMPED EITHER TO A SEDIMENT TANK AND/OR A</li> <li>SEDIMENT TRAP* WHEN A SEDIMENT TRAP/SEDIMENT TANK HAS</li> <li>REACHED 67% CAPACITY, THE CLEAN OUT OF SAME IS REQUIRED.</li> <li>NO. WATER WILL BE PULPED TO THE STORM DRAIN SYSTEM</li> <li>WITHOUT THE CONSENT OF THE SEDIMENT CONTROL INSPECTOR.</li> <li>7. ALL WATER DISCHARGED FROM THE SEDIMENT TANKS OR PUMPED</li> </ul>   | SEDIMENT CONTROL MEASURES<br>SILT FENCE, SUPER SILT FENCE, INLET PROTECTION, AND<br>STABILIZED CONSTRUCTION ENTRANCE PRACTICES WILL SERVE TO<br>PROVIDE MOST OF THE NECESSARY SEDIMENT CONTROL FOR THIS<br>SITE.                                       |
|  | FROM THE SITE MUST BE CLEAN AND FREE OF SEDIMENT.<br>8. ALL DEBRIS IS TO BE REMOVED FROM SITE.   | PERMANENT' STABILIZATION   |
| ire ties.<br>s are not                   | <ol> <li>ALLEY AND/OR STREETS/SIDEWALKS SHALL BE SWEPT CLEAN AT<br/>ALL TIMES DURING EXCAVATION AND CONSTRUCTION,</li> </ol>   | THE SITE SHALL BE PERMANENTLY STABILIZED PER THE SEQUENCE<br>OF CONSTRUCTION AND IN ACCORDANCE WITH D.C. STANDARDS.  |
| ties spaced                              | 10. ALL CATCH BASINS AND DRAIN AREAS SHALL BE PROTECTED<br>DURING EXCAVATIONS AND CONSTRUCTION.  | STORM WATER MANAGEMENT CONSIDERATIONS AND  |
|  | <ol> <li>IF ANY CATCH BASIN OR DRAIN BECOMES CLOGGED AS A RESULT<br/>OF EXCAVATION OR CONSTRUCTION, THE CONTRACTOR SHALL SE<br/>RESPONSIBLE FOR ITS CLEANING,</li> <li>ANY STOCKPILING, REGARDLESS OF LOCATION, SHALL BE</li> </ol>  | CALCULATIONS<br>BEST MANAGEMENT PRACTICES FOR STORM WATER MANAGEMENT<br>WILL SE PROVIDED BY WATER QUALITY FILTER SWALES. SEE<br>SHEET 2 FOR COMPUTATIONS AND DETAILS   |
| erlapped                                 | STABILIZED AND COVERED WITH-PLASTIC OR CANVAS AFTER ITS<br>ESTABLISHMENT AND FOR THE DURATION OF THE PROJECT.  |  |

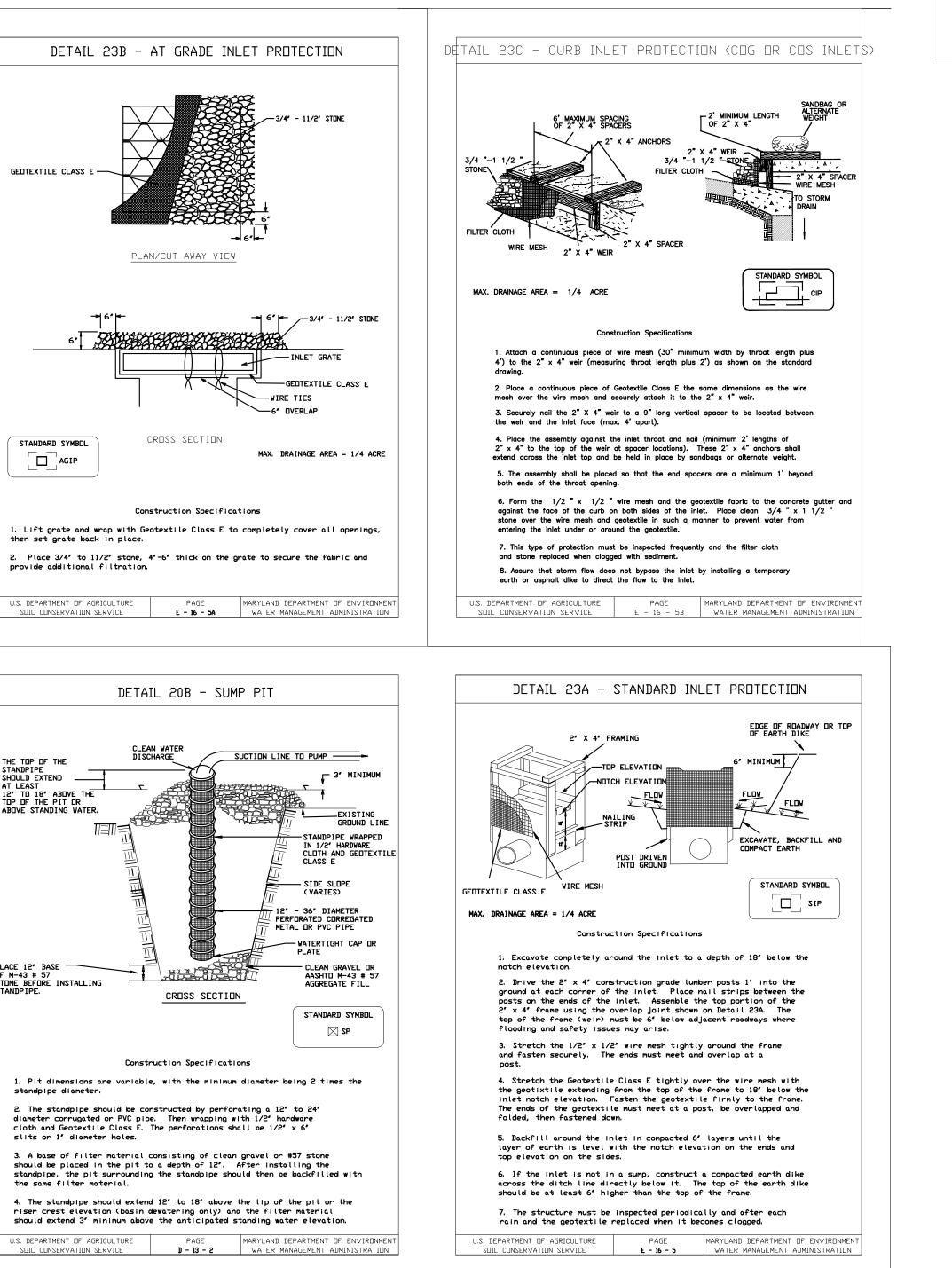
13. AFTER A RAZE OR DEMOLITION. THERE IS THE NEED FOR GROUND COVER SUCH AS SEED. SOD. PAVEMENT. BRICKBAT. OR MULCH TO PREVENT EROSION AND SEDIMENT RUNOFF FROM OCCURRING.

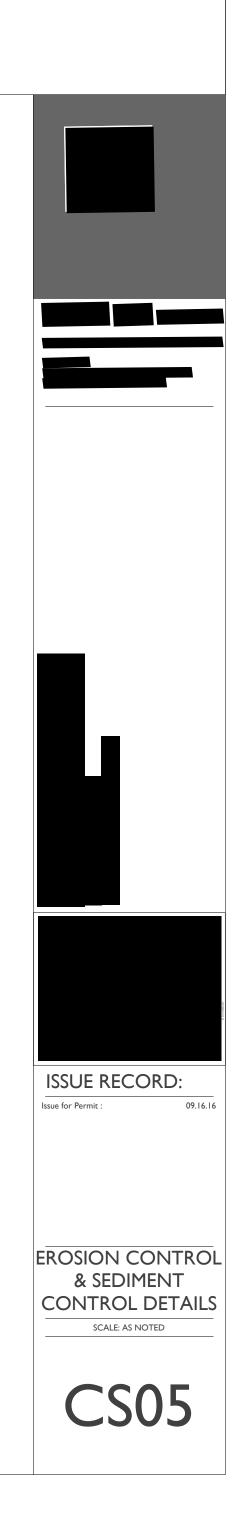
|             |                      |      |          | L<br>L |
|-------------|----------------------|------|----------|--------|
|             |                      |      |          |        |
|             |                      |      |          |        |
| ISSU        | JE REC               | CORE | ):       | D (    |
| Issue for I | <sup>9</sup> ermit : |      | 09.16.16 |        |

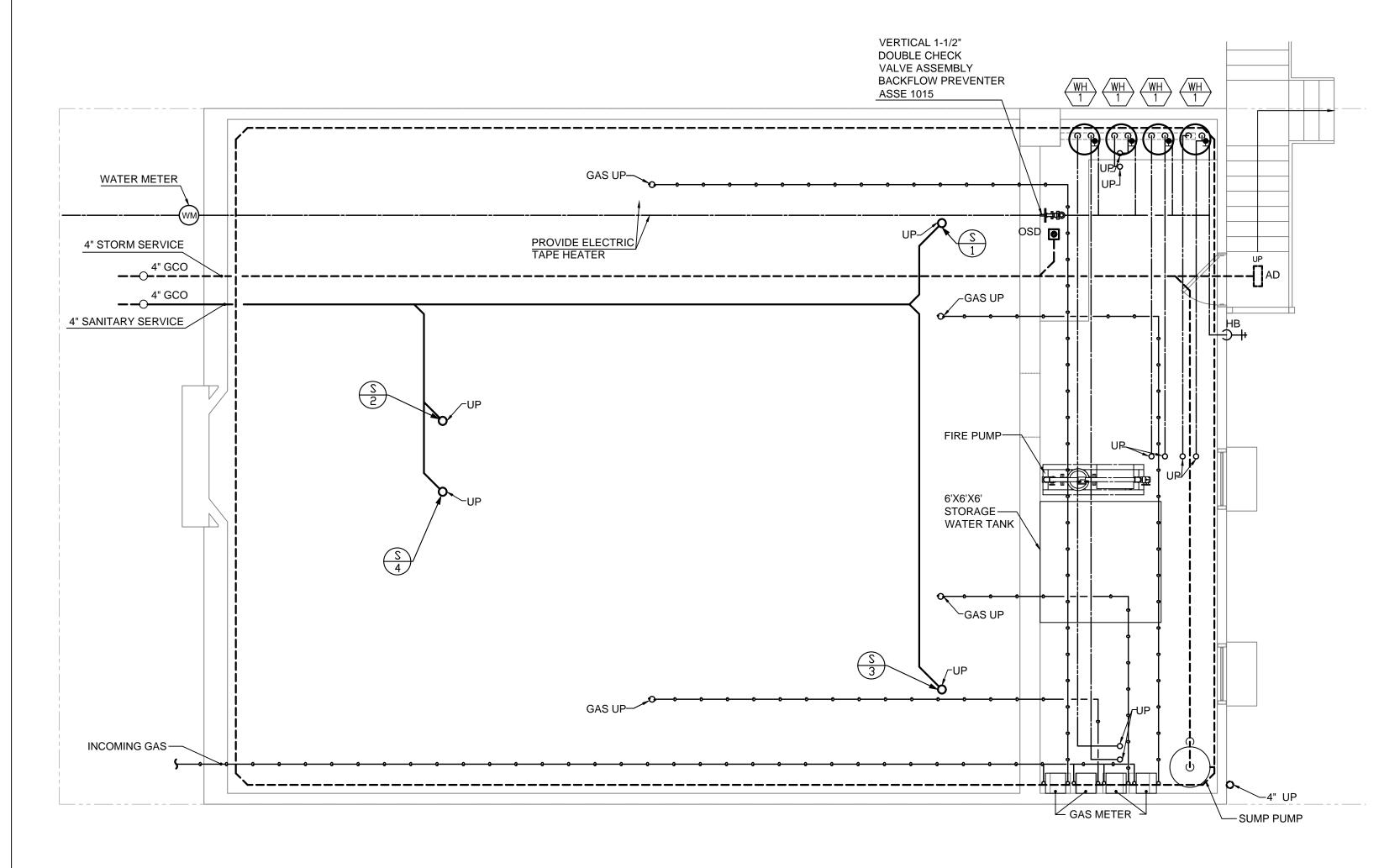
EROSION CONTROL & SEDIMENT CONTROL DETAILS SCALE: AS NOTED

CONTRACTOR TO CALL MISS UTILITY 1-800-257-7777

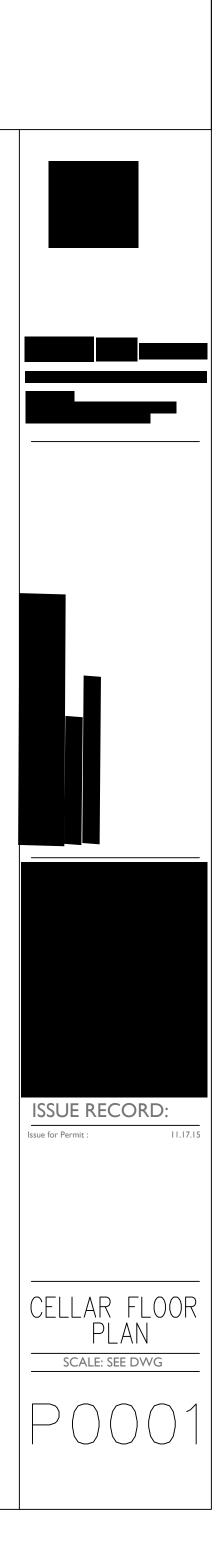


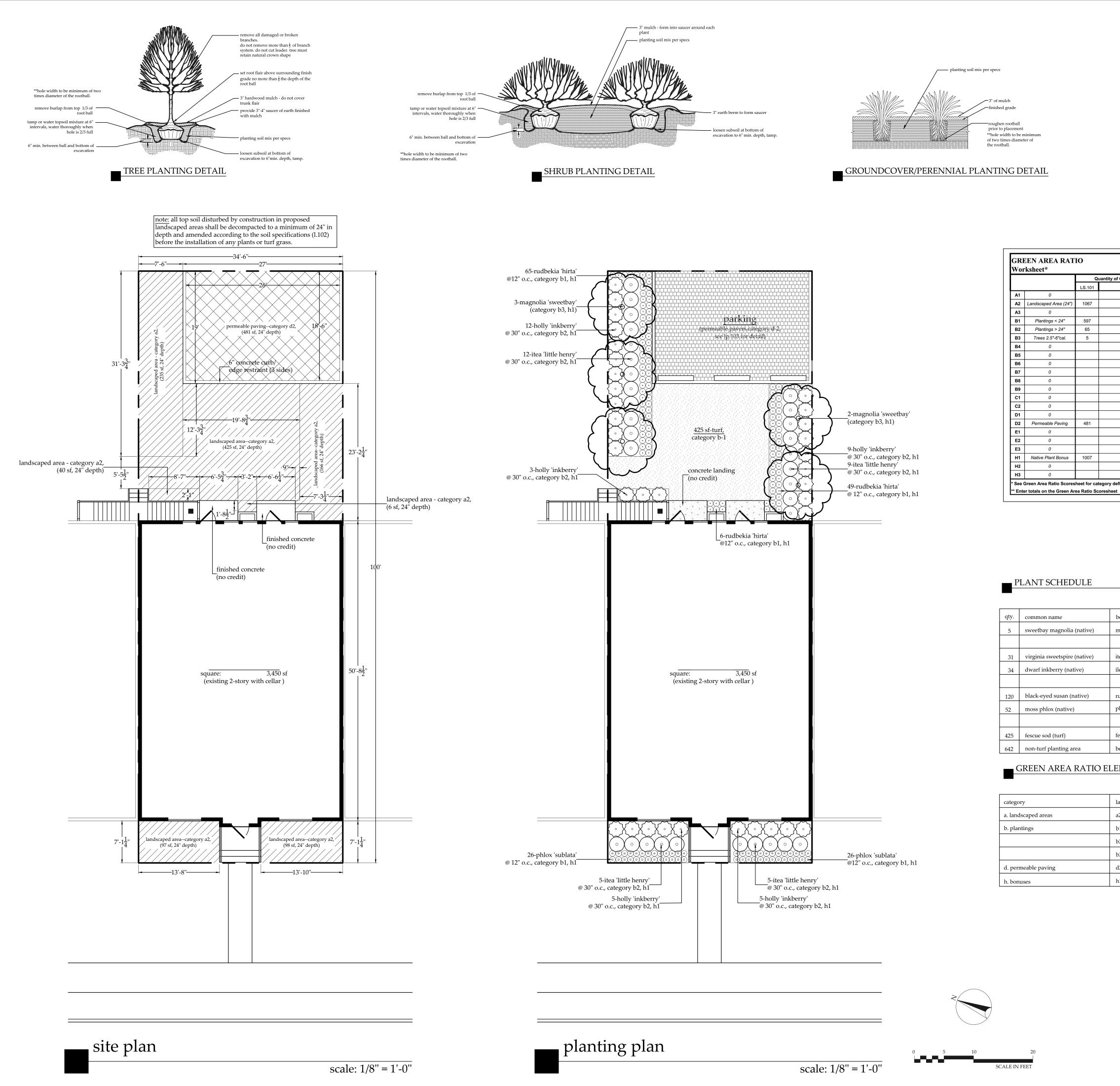












|   | *  | Address  |  | Green Area Ratio Scoresheet<br>Ward Lot Square Zoning District<br>R5-A/RA-1   |  |
|---|--|--|--|---|--|
|   |  | Other / BZA Order [  | Lot size (enter this value first)*   | enter sq ft of<br>lot multipi   |  |
|   |  | Landscape Elen   |  | 3,450 SCORE 0,406<br>Square Pt. Factor Total  |  |
|   | A  |  | select one of the following for each area)   | enter są ft   |  |
|   | 1  | Landscaped areas   | with a soil depth of less than 24"   | 0.3 -   |  |
|   | 2  | Landscaped areas   | with a soil depth of 24" or greater  | <b>1,067</b> 0.6 640.2  |  |
|   | 3  | Bioretention facilit   | ies  | enter sq ft 0 0.4 -   | REVISIONS  |
|   | В  | Plantings (credit for  | r plants in landscaped areas from Section A)   | enter sa ft   | 1 2nd Submission 1/3/17  |
|   | 1  | Groundcovers, or o   | other plants less than 2' tall at maturity   | <b>597</b> 0.2 119.4  |  |
|   | 2  |  | ng grasses, 2' or taller at maturity - calculated  | enter number of plants 65 585 0.3 175.5   |  |
|   | 3  |  | (typically planted no closer than 18" on center)<br>trees 2.5" to 6" diameter  | enter number of trees   |  |
|   |  |  | culated at 50 sq ft per tree   | enter number of trees   |  |
|   | 4  |  | w trees 6" diameter or larger<br>culated at 250 sq ft per tree   | <b>0</b> 0 0.6 -  |  |
|   | 5  |  | eservation of existing tree 6" to 12" diameter   | enter number of trees 0 0 0.7 -   | Ratio Plan<br>n & Planting Plan  |
|   | 6  |  | lent - calculated at 250 sq ft per tree<br>eservation of existing tree 12" to 18" diameter   | enter number of trees   | g Pla  |
|   | <b>-</b> ]    <sup>°</sup>   |  | lent - calculated at 600 sq ft per tree  | enter number of trees   |  |
|   | 7  |  | eservation of all existing trees 18" to 24" dia.<br>culated at 1300 sq ft per tree   | 0 0 0.7 -   | ant  |
| of GAR Features per Submitted Sheet   | **   |  | eservation of all existing trees 24" diameter  | enter number of trees 0 0 0.8 -   | atic الم   |
| 0   |  |  | lent - calculated at 2000 sq ft per tree<br>antings on a vertical surface  | enter sq ft 0 0.6 -   | S 3  |
| 0   |  | 0 /1   | -  |   |  |
| 597<br>65   |  | Vegetated or "gree   |  | enter sq ft   | Area<br>3 (Site Pl   |
| 5   |  | over at least 2" an  | d less than 8" of growth medium  | 0 0.6 -   | <b>If If</b>   |
|   | 2  | Over at least 8" of  | growth medium  | 0.8 -   | <b>V</b>   |
| 0   | D  | Permeable Paving*  | **   |   |  |
| 0<br>0  | 1  | Permeable paving   | over at least 6" and less than 24" of soil or gravel   | enter są ft<br>0.4 –  |  |
| 0   | 2  | Permeable paving   | over at least 24" of soil or gravel  | enter sq ft 481 0.5 240.5   | Gree<br>Sheet 1  |
| 0   | Ε  | Other  | _  |   | U  |
| 481<br>0  |  | Enhanced tree growth   | n systems***   | enter sg ft 0 0.4 -   |  |
| 0<br>0  |  | Renewable energy ge  | neration   | enter sq ft   |  |
| 1007  |  | Renewable energy ac  |  | enter są ft   |  |
| 0   | 3  | Approved water featu   | ıres   | 0 0.2 -   |  |
| efinitions<br>st  | н  | Bonuses  |  | sub-total of sq ft = 2,980  |  |
|   | 1  | Native plant specie  | 25   | enter sq ft  1,007 0.1 100.7  |  |
|   | 2  | Landscaping in food  | cultivation  | enter sg ft 0.1 -   |  |
|   |  |  |  | enter są ft   |  |
|   | 3  | Harvested stormwa  | ter irrigation   | 0 0.1 -   |  |
|   | *** Pei  | meable paving and structu  | ral soil together may not qualify for more than one th   |   |  |
|   | *** Pei  | meable paving and structur   |  |   |  |
|   | *** Pei  | meable paving and structu  |  | ird of the Green Area Ratio score.  |  |
|   | *** per  | meable paving and structu  |  | ird of the Green Area Ratio score.  |  |
| hotanical name  |  |  | Total square footage of all perme  | ird of the Green Area Ratio score.  |  |
|   | size   | spacing  | Total square footage of all permed   | ird of the Green Area Ratio score.  |  |
|   |  |  | Total square footage of all perme  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana   | size   | spacing  | Total square footage of all permed   | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'  | size<br>min 2.5" cal., 8' ht.  | spacing<br>on plan   | Total square footage of all permed   | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'  | size<br>min 2.5" cal., 8' ht.<br>15"-18"   | spacing<br>on plan<br>30" o.c.   | comments<br>b&b  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'  | size<br>min 2.5" cal., 8' ht.<br>15"-18"   | spacing<br>on plan<br>30" o.c.   | comments<br>b&b  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"  | spacing<br>on plan<br>30" o.c.<br>30" o.c.   | comments<br>b&b<br>container<br>container  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'   | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart  | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.   | Total square footage of all permed         comments         b&b         container  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.   | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.   | Total square footage of all permet         comments         b&b         container         container         container         container         container         see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>sf<br>sf   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.   | Total square footage of all permed         comments         b&b         container  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>sf<br>sf   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.   | Total square footage of all permet         comments         b&b         container         container         container         container         container         see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>sf<br>sf   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.   | Total square footage of all permet         comments         b&b         container         container         container         container         container         see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
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| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>Sf<br>E  | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>0 on plan<br>on plan   | Total square footage of all permet<br>comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102   | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>CE   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>0 n plan<br>on plan<br>0 n plan<br>0 n plan<br>7 sf (425 sf of turf  | rotal square footage of all permet<br>comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102<br>see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n   | size         min 2.5" cal., 8' ht.         15"-18"         15"-18"         quart         quart         quart         sf         Sf </td <td>spacing         on plan         30" o.c.         30" o.c.         12" o.c.         12" o.c.         12" o.c.         on plan         on plan         67 sf (turf and non plan)         7 sf (425 sf of turf)         5 sf (65 shrubs @ 9)</td> <td>rotal square footage of all permet<br/>comments<br/>b&amp;b<br/>container<br/>container<br/>container<br/>container<br/>container<br/>see landscape specs - 1.102<br/>see landscape specs - 1.102<br/>see landscape specs - 1.102<br/>see landscape specs - 1.102<br/>see landscape specs - 1.102</td> <td>ird of the Green Area Ratio score.</td> <td></td> | spacing         on plan         30" o.c.         30" o.c.         12" o.c.         12" o.c.         12" o.c.         on plan         on plan         67 sf (turf and non plan)         7 sf (425 sf of turf)         5 sf (65 shrubs @ 9)  | rotal square footage of all permet<br>comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102<br>see landscape specs - 1.102<br>see landscape specs - 1.102<br>see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or   | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>Sf<br>CE<br>CE<br>arr<br>hes or more<br>1,(<br>maturity<br>58<br>equivalent<br>25   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>5 sf (turf and no<br>7 sf (425 sf of turf<br>5 sf (65 shrubs @ 9<br>0 sf (5 trees @ 50 s   | rotal square footage of all permet<br>comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102<br>see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
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| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or<br>d2 - permeable paving over at least 24" of gra   | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>Sf<br>CE<br>CE<br>CE<br>arr<br>hes or more<br>1,(<br>maturity<br>59<br>haturity<br>58<br>equivalent<br>25<br>hvel<br>48   | spacing         on plan         30" o.c.         30" o.c.         12" o.c.         12" o.c.         12" o.c.         on plan         on plan         off plan         5 sf (turf and not plan)         5 sf (65 shrubs @ 9)         0 sf (5 trees @ 50 st)         1 sf (rear parking)   | Total square footage of all permet         comments         b&b         container         container         container         container         container         see landscape specs - 1.102  | ird of the Green Area Ratio score.  |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or<br>d2 - permeable paving over at least 24" of gra<br>h1 - native plant species  | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>sf<br>E<br>E<br>E<br>E<br>E<br>STATEMEN   | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>0 n plan<br>on plan<br>on plan<br>67 sf (turf and no<br>7 sf (425 sf of turf<br>5 sf (65 shrubs @ 9<br>0 sf (5 trees @ 50 s<br>1 sf (rear parking<br>007 sf (5 trees, 65   | rotal square footage of all permet<br>comments<br>b&b<br>b&b<br>container<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102   | Ind of the Green Area Ratio score.   able paving and enhanced tree growth   241     241     241                         |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or<br>d2 - permeable paving over at least 24" of gra<br>h1 - native plant species<br>This is to ce                                   | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>ZE<br>XE<br>XE<br>xel<br>art<br>hes or more<br>1,(<br>maturity<br>59<br>haturity<br>59<br>haturity<br>59<br>haturity<br>58<br>equivalent<br>25<br>hyperfection<br>54<br>57<br>58<br>59<br>59<br>59<br>59<br>59<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50   | spacing         on plan         30" o.c.         30" o.c.         12" o.c.         12" o.c.         12" o.c.         on plan         on plan         off plan         on plan         on plan         off plan         on plan         07 sf (turf and no         7 sf (425 sf of turf         5 sf (65 shrubs @ 9         0 sf (5 trees @ 50 s         1 sf (rear parking         007 sf (5 trees, 65         TBY CER'         amined all r   | rotal square footage of all permee<br>comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape s   | Ind of the Green Area Ratio score.   able paving and enhanced tree growth   241     241     241     241     241     241 |  |
| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or<br>d2 - permeable paving over at least 24" of gra<br>h1 - native plant species<br>This is to ce<br>further certif                 | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>E<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>X  | spacing<br>on plan<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>on plan<br>on plan<br>on plan<br>on plan<br>on plan<br>30"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>13"  o.c.<br>15  or plan<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>30"  o.c.<br>12"  o.c.<br>30"  o.c.<br>30" | comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see landscape specs - 1.102   | Ind of the Green Area Ratio score.       241         able paving and enhanced tree growth       241                     | nd   |
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| magnolia virginiana<br>itea virginica 'little henry'<br>ilex glabra 'shamrock'<br>rudbekia 'hirta'<br>phlox 'sublata'<br>fescue sp.<br>bed preparation<br>EMENTS BY ELEMENT & SIZ<br>landscape element<br>a2 - landscaped areas with a soil depth of 24 incl<br>b1 - groundcovers, or other plants less than 2' at<br>b2 - plants, not including grasses, 2' or taller at n<br>b3 - tree canopy for all trees 2.5" - 6" diameter or<br>d2 - permeable paving over at least 24" of gra<br>h1 - native plant species<br>This is to ce<br>further certif                 | size<br>min 2.5" cal., 8' ht.<br>15"-18"<br>15"-18"<br>quart<br>quart<br>quart<br>quart<br>sf<br>sf<br>Sf<br>E<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>XE<br>X  | spacing<br>on plan<br>30" o.c.<br>30" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>12" o.c.<br>5 sf (turf and no<br>con plan<br>on plan<br>on plan<br>on plan<br>on plan<br>of sf (turf and no<br>7 sf (425 sf of turf<br>5 sf (65 shrubs @ 9<br>0 sf (5 trees @ 50 s<br>1 sf (rear parking<br>007 sf (5 trees, 65<br>1 sf (rear parking<br>007 sf (5 trees, 65   | comments<br>b&b<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>container<br>see landscape specs - 1.102<br>see lands   | Ind of the Green Area Ratio score.       241         able paving and enhanced tree growth       241                     | nd   |
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# **General Planting Installation Notes**

- 1. The contractor is responsible for verifying utility depths and avoiding conflicts when trenching over or across areas where utilities exist.
- 2. Contractor to contact 'miss utility' 72 hours prior to the commencement of work on the site. No work is to begin until all utilities are marked. If utility line/tree conflicts are evident, please contact landscape architect.
- Verification of the accuracy of the total quantities shown in the plant schedule shall be the responsibility of the contractor. In the event of discrepancy, the planting plan shall govern. Any plant substitutions proposed require the approval of the owner or landscape architect.
- 4. All plants shall be nursery grown, well branched, true to type specimen material, free of insect infestation, injury, disease or other defects. Plants are to conform to standards set in american standard for nursery stock and shall meet or exceed measurements specified in the plant schedule.
- 5. The contractor shall warrant all new plantings for a period of one year from the date of final acceptance. All replacement plants shall conform to original specifications. When planting operations must be performed outside the normal planting season for the locality, this warranty may be renegotiated with the owner prior to planting.
- 6. Planting and bed preparation are to be conducted under favorable weather conditions. Under no circumstances shall soil be worked, driven over, or walked upon while in a wet condition.
- 7. The contractor is responsible for reporting to the landscape architect any conditions on site that vary from the plans and that effect installation.
- 8. Prune only broken or crossing branches. Do not thin tree canopies.
- 9. Contractor to install tree protection fencing as needed and is responsible for replacing any damaged trees on site.
- 10. All new planting to be fed with an organic slow release fertilizer.
- 11. Contractor is responsible for watering and insect control until the date of final inspection.
- 12. The work area is to be kept reasonably neat and clean and all debris hauled away and disposed of legally, off site, in a timely manner.
- 13. It shall be the contractor's responsibility to perform all work in a manner that protects completed work by others, such as curbs, utilities, drainage, fences, driveway aprons, drives, vegetation, etc. The contractor shall be responsible for the cost of satisfactory repair of all damage in kind resulting from his failure to comply.

# Landscape Specifications

- 1. Plant material shall conform in size and grade to american standards for nursery stock.
- 2. Plant materials shall be of standard quality of their species or variety. Plants shall be carefully labeled and sizes noted. Right is reserved to reject plants considered as unsatisfactory. Rejected plants shall be removed from site. Plants should not be pruned prior to delivery. Heading- back plants to meet sizes indicated in drawing schedule will not be permitted.
- 3. Grass seed / sod all permanent grass seed / sod shall be listed on the current virginia turf grass variety recommendations and be blue tag certified. All newly laid sod to be rolled with water-filled metal drum to achieve uniform appearance. All sod should be cut and laid within 24 hours.

### **Plants and Trees**

- 1. Contractor shall stake the location of each tree and shrub in accordance with the locations shown on the drawing. Staking and layout shall be done sufficiently in advance of planting operation to permit the contracting officer to check, revise if desired, and approve the locations before digging operations begin.
- 2. Excavate planting beds and pockets to a depth required for planting. At least 2/3 of ball below finished grade
- Remove the burlap, twine, and wire baskets from the top 1/3 of all b&b root balls. No plastic twine or burlap shall be permitted on b&b plants. Planting pits shall be the same depth as root balls.
- 4. Any rock or other underground obstruction shall be removed to depth necessary to permit planting according to specification.
- 5. Plants shall be treated at the time of planting with anti- desiccant as specified in full accordance with the directions furnished by the manufacturer.
- 6. All plant labels and tags to be removed after final inspection.
- 7. In general, contractor shall thoroughly water all planted areas after planting and in dry weather. Use enough water to thoroughly soak all tree pits before planting. Contractor shall make necessary arrangements in advance of start of work to insure that an adequate supply of water and watering equipment are available when required.

# Mulching

- 1. Mulch top of root ball and saucer within 48 hours to a minimum depth of 2" and to a depth not to exceed 3".
- 2. All shade and flowering trees shall be mulched with 3 inches thick (settled and covering an area twelve inches greater than the diameter of pit.
- All plantings are to be provided with a 3" depth of triple shredded hardwood bark mulch (2" depth in ground cover areas). Mulch to bed lines where shown. Hedges are to be mulched as continuous beds of the width shown on plan (plants are not to be mulched individually). Trees shall be mulched within a minimum three (3) foot radius of each trunk. Re-mulch existing plantings.
- 4. No mulch is to be placed in plant crowns or against tree trunks.

### Soil and Amendment Specification

Macronutrients & micronutrients

**Topsoil Physical and Chemical Parameters** 

| Topsoil characteristic       | <b>Test Method</b> |
|------------------------------|--------------------|
| Texture class                |                    |
| % Sand (0.05 mm-2.00 mm)     | Hydrometer < 70%   |
| % Silt (0.002 mm-0.05 mm)    | Hydrometer < 70%   |
| % Clay (< 0.002 mm)          | Hydrometer < 30%   |
| % Organic matter (by weight) | Loss of Ignition   |
| pH                           |                    |

# Soil Source

The topsoil and subgrade may be from a naturally occurring soil or soil that has been mixed to achieve the requirements of the plant selections.

### **Debris Content**

Particles and stone greater than 1 inch in the longest dimension should not be allowed. This includes fragments of brick, concrete, wood, glass, metal, stone, and plastic. The total volume less than 1 inch long should not be more than 5% of the soil volume. Stones ranging from 0.5 to 1 inch (1.25 to 2.5 cm) should not exceed 5% of the soil volume, and gravel <sup>1</sup>/<sub>4</sub> to <sup>1</sup>/<sub>2</sub> inches (0.6 to 1.25 cm) should not exceed 5% of the soil volume.

**Contaminants Prohibited** The soil shall have no herbicides, heavy metals, biological toxins, or hydrocarbons that will impact plant growth.

Texture

Topsoil texture can be variable and include: loam, silt loam, sandy clay loam, sandy loam, clay loam. The percent composition must fall within this range: sand (< 70 %), silt (< 70%), and clay (<30%). Particle size is determined according to USDA Classification: sand (< 0.002mm), silt 0.002mm-0.05 mm, sand (0.05 mm-2 mm).

Soil texture triange (source: USDA NRCS)

### **Organic Matter**

compost to raise organic matter content.

### Soil pH

Soil pH determines the availability of nutrients in the soil. The exact pH range is dependent on the plant species to be planted and should be tested and adjusted based on species prior to installation. The ideal pH for most landscape plants falls in the range of 6.0-7.0, however other plants prefer a pH outside this range. A pH of 6.5-7.2 is beneficial to microbial activity that converts nitrogen, phosphorous, and sulfur into forms most available to plants.

**Nutrient Recommendations** 

### Subgrade Preparation

# Percolation

After preparing the subgrade, conduct a percolation test. Water should readily drain from the soil. Percolation rates of 1-2 inches per hour are preferred if irrigation will be installed. A drainage system should be installed if the native subsoil has a drainage rate less than 1 inch per hour.

# Handling, Storage, and Spreading Topsoil

Material shall not be handled or hauled when it is wet, as after a heavy rainfall or if frozen. Soil shall be handled only when the moisture content is less than at field capacity. The Landscape Expert or a professional soil scientist shall be consulted to determine if the soil is too wet to loam. Stockpiles shall be covered during wet weather. Spread topsoil in no greater than 12-inch lifts, using the lightest possible equipment. Compact the topsoil to the proper soil density so that it is suitable for root growth and plant stability.

### Soil Density and Compaction

Soil density must be high enough to avoid settlement and low enough to encourage root growth. Using a rod penetrometer, soil and subsoil shall be less than 260 pounds per square inch (psi) throughout the depth of credited soil. Compaction completely inhibits root growth at 300 psi. A rod cone penetrometer should be used to measure compaction when soil moisture is at field capacity, after the soil is wetted but drained. The penetrometer shall be inserted at a rate of 72 inches per minute (1.2 inches/second), according to ASAE Soil Testing Specifications.

# SOIL IMPROVEMENT SPECIFICATION (AMENDMENTS)

### Compost

Compost shall be derived from plant material and provided by a member of the U.S. Composting Seal of Testing Assurance (STA) program. See www.compostingcouncil.org for a list of local providers. Alternative specifications and/or certifications, such as those administered by the Maryland Department of Agriculture or other agencies, may be substituted, as authorized by DDOE. In all cases, compost material must meet standards for chemical contamination and pathogen limits pertaining to source materials, as well as reasonable limits on phosphorus and nitrogen content to avoid excessive leaching of nutrients. The compost shall be the result of the biological degradation and transformation of plant derived materials under conditions that promote anaerobic decomposition. The material shall be well composted, free of viable weed seeds, and stable with regard to oxygen consumption and carbon dioxide generation. The compost shall have a moisture content that has no visible free water or dust produced when handling the material. It shall meet the following criteria, as reported by the U.S. Composting Council Seal of Testing Assurance Compost Technical Data Sheet provided by the vendor:

- 1. 100% of the material must pass through a 1/2-inch screen
- 2. The pH of the material shall be between 6 and 8
- 3. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0% 4. by weight
- 5. The organic matter content shall be between 35% and 65%
- 6. Soluble salt content shall be less than 6.0 mmhos/cm
- 7. Maturity must be greater than 80%
- 8. Stability shall be 7 or less
- 9. Carbon/nitrogen ratio shall be less than 25:1 10. Trace metal test result = "pass"

11. The compost must have a dry bulk density ranging from 40 to 50 lb/ft<sub>3</sub> **Compost Application Rate** 

Add 1.75 inches of compost per 8 inches of existing topsoil and incorporate by rototilling or mixing prior to respreading stockpiled topsoil. Scarify the subgrade down to a 4-inch depth. Using 35% to 60% organic matter in compost, this will provide a topsoil organic matter rate of 5%. The amended soil and subsoil together provide 12 inches of amended topsoil. For deeper soils, such as planting beds, mix compost and topsoil at the same rate.

The DDOE 2013 Stormwater Management Guidebook, Appendix J, describes compost application rates for impervious cover disconnections and grass swales.

# Additional Amendments

recommended by the soil testing laboratory.

Landscape Maintenance Plan:

# Soils and Amendments

Decompaction: Decompact topsoil by tilling or su underneath existing trees; instead consider practic Mulch: Apply yearly or as necessary to replace decomposed mulch. Compost: Apply compost yearly at 1-2 inch depth. Coarse textured sand and clay soils require greater compost addition than loamy soils. The organ matter content of the chosen compost will determine the depth applied Fertilizer: If choosing to apply fertilizer, perform a soil test for nutrient levels only after incorporating compost into topsoil. This will avoid over-application of nutrients, as compost itself will increase the nutrient content. Material source: Compost should be well-decomposed material, stable, free of weeds, contaminants and foul odors. Compost may be derived from waste (decomposed leaves, grass clippings, branches) or food waste. Mulch can be derived from organic sources such as shredded bark, or leaf mul

### Landscape Areas All Plantings:

- possible.
- 5. Remove dead plant material and replant in the next appropriate growing season.
- 6. Remove weeds on a regular basis.
- **Trees and Shrubs:**
- precipitation if less than 1 inch per week.
- remove more than 20% of the tree canopy during pruning activities in any year.
- 3. Spread mulch to 2-4 inch depth.

**Perennials and Groundcovers:** 1. In the early spring, deadhead top-growth from perennials and warm-season grasses.

- 3. Spread mulch at a maximum 2-inch depth.
- **Turfgrass**:
- 1. Test soil for pH and apply lime only as necessary.
- in-place after mowing requires less fertilizer application.
- 3. Regularly monitor and over-seed bare spots to prevent weed establishment.
- 4. In late fall, core aerate and topdress with organic matter.
- **Tree Preservation**
- mulch the entire planting area.
- recommended as mulches because they decompose rapidly
- Never prune more than 20% of a tree canopy per year.
- construction.

### **Required Standard** Loam, silt loam, sandy clay loam, sandy loam, clay loam

Lawn areas (4%-6%), Planting beds (5-7%) 6.0-7.2, specific plantings may require alternate values Determined by professional soil scientist

Organic matter should be a minimum of 4% in lawn soils and 5% in planting beds. Percentage organic matter is measured by weight. Incorporate

Have a soil scientist provide recommendations for macronutrients and micronutrients.

Using a backhoe or similar device, scarify and loosen the subgrade. Remove from the area all debris or stones that are one inch or greater.

To achieve a minimum 5% organic matter content, apply compost at the rate specified below.

Limestone - dolomitic limestone containing no less than 50% total carbonates and 25% total magnesium with a neutralizing value of at least 100%. Acidulant - commercial grade sulfur, ferrous sulfate, and aluminum sulfate for horticultural use.

Fertilizer - granular or pelleted slow-release fertilizer consisting of 50% water-insoluble nitrogen, phosphorous, and potassium in a composition

| ibsoiling and incorporating compost throughout the depth of compacted soil. Do not till soils |
|---|
| ces such as mulching under the canopy or air tilling to ameliorate compaction.                |
| acomposed mulch   |

1. Provide supplemental watering if rainfall is less than 1 inch per week during the first two growing seasons.

2. Conduct weeding as necessary to reduce competition between weeds and new plantings for nutrients, soil moisture, and sunlight.

3. Replace mulch as necessary to reduce competition for available moisture and nutrients.

4. Monitor the plantings for disease or stress and modify cultural practice as necessary. Employ an integrated pest management (IPM) approach a

1. For trees, install 20-gallon slow leak watering bags (Tree Gator or equal) for the first two growing seasons and water as necessary to supplement

2. Inspect trees for signs of dead, diseased, or crossing branches and prune accordingly. Remove hazard limbs especially from established trees.

4. Maintain the health of the tree by limiting all grade changes and other soil disturbance underneath the tree's Critical Root Zone.

2. Periodically divide perennials as necessary to encourage rejuvenated growth.

2. Maintain turfgrass at an increased height to reduce weed germination. Never mow more than one third of the grass height. Leaving grass clipped and the grass height to reduce weed germination.

1. The property owner must replace dead trees with an equivalent landscape element to meet the minimum-required GAR score for the site. 2. Where appropriate, spread 3 inches of organic mulch over the soil surface out to the drip line of preserved tree. If preserved trees are clustered

3. Mulch should never be more than 4 inches deep or applied to the tree trunk.

4. Apply slow-decomposing organic mulches, such as shredded bark, compost, leaf mulch, or wood chips. Grass clippings and sawdust are not

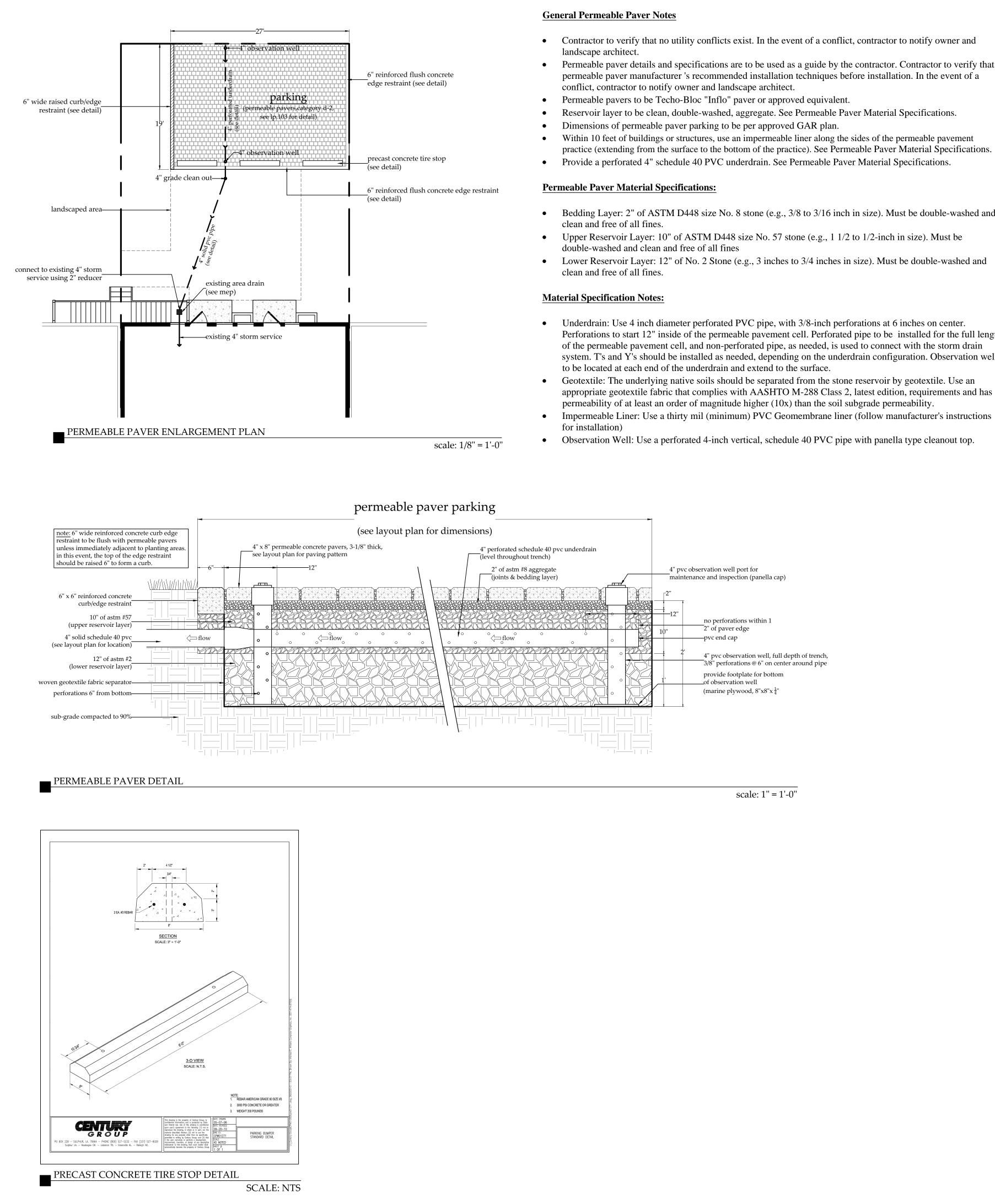
5. As needed, prune dead, diseased, broken or crossing branches. Elevate lower branches to provide clearance for pedestrian and vehicular below

6. Existing trees whose roots have been pruned during construction should be watered at least once a week during the first growing season after

7. Water trees deeply and slowly to encourage deeper root growth. Soaker hoses and drip irrigation work best for deep watering of trees. 8. Consult with a qualified professional for tree pruning, fertilization, and hazard condition management.

| <b>STATEMENT BY CERTIFIED LANDSCAPE EXPERT</b><br>This is to certify that I have examined all required GAR plan submittals prior to submission. I further certify that all aspects of the submittal, including landscape elements within the Lot and the listed GAR score, meet the specifications required under Subtitle C, Chapter 6 of Title 11 of the District of Columbia Municipal Regulations. |               |
|--|---------------|
| Landscape Architect  |               |
| Name and Title   | DATE:         |
| Address  | November 2016 |
| Date: Phone No:  | SCALE:        |
|  | Varies        |
|  | SHEET NUMBER: |
| Certified Landscape Expert Signature:       Certifying Organization       Certification Number         Sheets:       LP.101, LP.102, LP.103  | LP.102        |

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| n yard<br>lch.          | 1         2nd Submission         1/3/17                                 |
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| if                      | lan<br>cations)   |
|                         | <b>Green Area Ratio Plan</b><br>Sheet 2 of 3 (Landscape Specifications) |
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| Title 11                |   |
|                         | DATE:<br>November 2016  |
|                         | SCALE:<br>Varies  |
| umber                   | SHEET NUMBER:   |



• Contractor to verify that no utility conflicts exist. In the event of a conflict, contractor to notify owner and

• Permeable paver details and specifications are to be used as a guide by the contractor. Contractor to verify that permeable paver manufacturer 's recommended installation techniques before installation. In the event of a conflict, contractor to notify owner and landscape architect.

• Permeable pavers to be Techo-Bloc "Inflo" paver or approved equivalent.

• Reservoir layer to be clean, double-washed, aggregate. See Permeable Paver Material Specifications.

• Dimensions of permeable paver parking to be per approved GAR plan.

• Within 10 feet of buildings or structures, use an impermeable liner along the sides of the permeable pavement practice (extending from the surface to the bottom of the practice). See Permeable Paver Material Specifications. • Provide a perforated 4" schedule 40 PVC underdrain. See Permeable Paver Material Specifications.

• Bedding Layer: 2" of ASTM D448 size No. 8 stone (e.g., 3/8 to 3/16 inch in size). Must be double-washed and

• Upper Reservoir Layer: 10" of ASTM D448 size No. 57 stone (e.g., 1 1/2 to 1/2-inch in size). Must be

• Lower Reservoir Layer: 12" of No. 2 Stone (e.g., 3 inches to 3/4 inches in size). Must be double-washed and

• Underdrain: Use 4 inch diameter perforated PVC pipe, with 3/8-inch perforations at 6 inches on center. Perforations to start 12" inside of the permeable pavement cell. Perforated pipe to be installed for the full length of the permeable pavement cell, and non-perforated pipe, as needed, is used to connect with the storm drain system. T's and Y's should be installed as needed, depending on the underdrain configuration. Observation wells to be located at each end of the underdrain and extend to the surface.

• Geotextile: The underlying native soils should be separated from the stone reservoir by geotextile. Use an appropriate geotextile fabric that complies with AASHTO M-288 Class 2, latest edition, requirements and has a permeability of at least an order of magnitude higher (10x) than the soil subgrade permeability.

• Observation Well: Use a perforated 4-inch vertical, schedule 40 PVC pipe with panella type cleanout top.

—pvc end cap 4" pvc observation well, full depth of trench, 3/8" perforations @ 6" on center around pipe provide footplate for bottom \_of observation well

scale: 1" = 1'-0"

# **Permeable Paver Installation**

The following is a typical construction sequence to properly install permeable pavement, which may need to be modified depending on the particular type of permeable pavement that is being installed.

Step 1: Stabilize Drainage Area. Construction of the permeable pavement should only begin after the entire contributing drainage area has been stabilized. The proposed site should be checked for existing utilities prior to any excavation. Do not install the system in rain or snow and do not install frozen bedding materials.

Step 2: Install Soil Erosion and Sediment Control Measures for the Bioretention. As noted above, temporary soil erosion and sediment controls are needed during installation to divert stormwater away from the permeable pavement area until it is completed. Special protection measures, such as erosion control fabrics, may be needed to protect vulnerable side slopes from erosion during the excavation process. The proposed permeable pavement area must be kept free from sediment during the entire construction process. Construction materials contaminated by sediment must be removed and replaced with clean material.

Step 3: Minimize Impact of Heavy Installation Equipment. Where possible, excavators or backhoes should work from the sides to excavate the reservoir layer to its appropriate design depth and dimensions. For small pavement applications, excavating equipment should have arms with adequate extension so they do not have to work inside the footprint of the permeable pavement area (to avoid compaction). Contractors can utilize a cell construction approach, whereby the proposed permeable pavement area is split into 500- to 1,000-square foot temporary cells with a 10- to 15-foot wide earth bridge in between, so cells can be excavated from the side. Excavated material should be placed away from the open excavation so as to not jeopardize the stability of the side walls.

**Step 4: Promote Infiltration Rate.** The native soils along the bottom of the permeable pavement system should be scarified or tilled to a depth of 3 to 4 inches prior to the placement of the filter layer or geotextile fabric. In large-scale paving applications with weak soils, the soil subgrade may need to be compacted to 95 percent of the Standard Proctor Density to achieve the desired load-bearing capacity.

Note: This may reduce or eliminate the infiltration function of the installation, and it must be addressed during hydrologic design.

Step 5: Order of Materials. Geotextile fabric should be installed on the sides of the reservoir layer (and the bottom if the design calls for it). Geotextile fabric strips should overlap down-slope by a minimum of 2 feet and be secured a minimum of 4 feet beyond the edge of the excavation. Where the filter layer extends beyond the edge of the pavement (to convey runoff to the reservoir layer), install an additional layer of geotextile fabric 1 foot below the surface to prevent sediment from entering into the reservoir layer. Excess geotextile fabric should not be trimmed until the site is fully stabilized.

Step 6: Install Base Material Components. Provide a minimum of 2 inches of aggregate above and below the underdrains. The up-gradient end of underdrains in the reservoir layer should be capped. Where an underdrain pipe is connected to a structure, there shall be no perforations within 1 foot of the structure. Ensure there are no perforations in clean-outs and observation wells within 1 foot of the surface.

Step 7: Stone Media. Spread 6-inch lifts of the appropriate clean, double washed stone aggregate (usually No. 2 or No. 57 stone). Place at least 4 inches of additional aggregate above the underdrain, and then compact it using a vibratory roller in static mode until there is no visible movement of the aggregate. Do not crush the aggregate with the roller.

Step 8: Reservoir Media. Install the desired depth of the bedding layer, depending on the type of pavement, as indicated in Table 3.14.

Step 9: Paving Media. Paving materials shall be installed in accordance with manufacturer or industry specifications for the particular type of pavement.

**Permeable Paver Maintenance** 

(Source: DC Green Area Ratio Guidebook, Chapter 6 - Table 11, March 2015)

paver that is being installed.

- Clogging of paver systems with sediment and organic material is the most frequently cited maintenance item. • Regular street sweeping and inspection of the paver system is required to remove accumulated sediment and to provide maintenance repairs as needed to help prevent clogging. It is critical that surrounding areas remain stabilized and do not introduce sediment on to the permeable pavement.
- sediment on to the pavement areas.
- pavement surfaces that are degenerating or spalling

- Once every 2-3 Years: Remove any accumulated sediment in pretreatment areas and inflow areas

### (Source: DDOE Stormwater Management Guidebook, Section 3.7, July 2013)

The following are typical maintenance tasks for permeable pavers which may need to be modified depending on the particular type of permeable

• Maintenance is critical to the performance and longevity of permeable paving systems.

• After installation: For the first 6 months following Construction, the practice and Contributing Drainage Area (CDA) should be inspected at least twice a week after storm events that exceed <sup>1</sup>/<sub>2</sub> inch or rainfall. Stabilize any failing areas that may be depositing

• Once every 1-2 months during the growing season: Mow the grass in a vegetated permeable pavement application. • As Needed: Stabilize the CDA to prevent erosion, remove any soil or sediment deposit on pavement, and replace or repair any

• 2-4 times a year: Mechanically sweep pavement with standard street sweeper

• Annually: Conduct a maintenance inspection, and spot weed for grass applications

• If clogged: Conduct maintenance using a regenerative street or vacuum sweeper. Replace any joint materials

| <b>STATEMENT BY CERTIFIED LANDSCAPE EXPERT</b><br>This is to certify that I have examined all required GAR plan submittals prior to submission. I further certify that all aspects of the submittal, including landscape elements within the Lot and | - |                        |
|--|---|------------------------|
| the listed GAR score, meet the specifications required under Subtitle C, Chapter 6 of Title 11<br>of the District of Columbia Municipal Regulations.<br>Landscape Architect<br>Name and Title  |   |                        |
| Address<br>Date: Phone No:   |   | DATE:<br>November 2016 |
|  |   | SCALE.<br>Varies       |
| Certified Landscape Expert Signature:       Certifying Organization       Certification Number         Sheets:       LP.101, LP.102, LP.103  |   | LP.103                 |

|                   | REVISIONS       1     2nd Submission       1/3/17       1       1       1       1       1       1       1       2nd Submission       1/3/17       1 |
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|                   | <b>Green Area Ratio Plan</b><br>Sheet 3 of 3 (Permeable Paver<br>Details & Specs.)  |
|                   |   |
|                   |   |
| n. I<br>and<br>11 | DATE:<br>November 2016  |
|                   | SCALE:<br>Varies  |

|            |  |  |         |                | SECTION 02930 - EXTERIOR PLAN  |
|------------|--|--|---------|----------------|--|
|            | STATEMENT BY CERTIFIED LANDS   | CAPE EXPERT  |         |                | PART 1 - GENERAL<br>1.1 RELATED DOCUMENTS  |
| aspects o  | certify that I have examined all required GAR plan submittals pr<br>f the submittal, including landscape elements within the Lot and t     | he listed GAR score, mee                                 | et the  | fy that all    | <ul> <li>A. Drawings and general provision</li> <li>Specification Sections, apply to the I.2 SUMMARY</li> <li>A. Section Includes:</li> </ul>                                  |
| specificat | tions required under Chapter 34 of Title 11 of the District of Colu  | moia Municipal Regulati                                  | ons.    |                | I. Trees.<br>2. Shrubs.  |
|            | Name and Title (please type)   | ,  |         |                | <ol> <li>Ground cover.</li> <li>Plants.</li> <li>Tree stabilization.</li> </ol>  |
|            | Address  |  |         |                | <ul> <li>B. Related Sections:</li> <li>I. Division 2 Section "Site Clear clearing.</li> </ul>  |
|            | Address  |  |         |                | <ol> <li>Division 2 Section "Earthwork<br/>backfill materials.</li> <li>Division 2 Section "Lawns and</li> </ol>   |
|            | DatePhone No:  | ,  |         |                | <ul><li>I.3 DEFINITIONS</li><li>A. Backfill: The earth used to re</li><li>B. Balled and Burlapped Stock:</li></ul>   |
| Certified  | Landscape Expert Signature: Certifying Organizat   | ion Certificati  | ion Nur | nber           | less than diameter and depth record<br>supported, and drum laced as record<br>C. Balled and Potted Stock: Ex   |
|            | TS IN GAR SET: L700, L701, L702, L703<br>, L708, 007, CIV800, CIV900, CIV910,  |  | L706    | <b>`</b> ,     | in a container. Ball size is not less required.  |
| L/U/       | , L700, 007, CIV000, CIV000, CIV010,   | AROUZ  |         |                | D. Container-Grown Stock: Hea<br>system reaching sides of container<br>hold ball shape and protect root ma   |
|            | GUIDANCE PER CONVERSATION WITH DCF   | RA (MATT LEGRA   | NT -    |                | required.<br>E. Finish Grade: Elevation of fin<br>F. Manufactured Topsoil: Soil p  |
|            | CH 2016):<br>DO NOT INCLUDE FEDERAL LAND (LOTS:  | 803 \$ 810)  |         |                | amendments to produce topsoil or<br>G. Multi-Stem: Where three or<br>root crown.   |
| -          | SUM OF PERCENTAGE OF ZONE REQUIR<br>826  | EMENTS PER LO  | TS 8    | 52  ŧ          | <ul><li>H. Planting Soil: Native or impo<br/>amendments.</li><li>I. Subgrade: Surface or elevat</li></ul>  |
| -          | LOT: $821 = C - 2 - A$ : $36,434.2 \text{ SQ. FT.}$  | + R-5-B: 78,28   | 8.4     |                | placing planting soil.<br>J. Subsoil: All soil beneath the<br>I.4 SUBMITTALS   |
|            | LOT: 826 = C-2-A: 8,413.0 SQ. FT. +  |  |         |                | <ul> <li>A. Product Data: For each type</li> <li>B. Qualification Data: For qualifi</li> <li>C. Product Certificates: For each</li> </ul>                                      |
| -          | TOTAL: C-2-A: 44,847.2 (23.8%) (0.07   | 7 4)   |         |                | <ol> <li>Manufacturer's certified analy</li> <li>Analysis of other materials by</li> <li>Analytical Chemists, where applicable</li> </ol>                                      |
|            | TOTAL: R-5-B: 143,704.5 (76.2%) (0.3   | 3049)  |         |                | D. Material Test Reports: For e<br>E. Planting Schedule: Indicating<br>F. Maintenance Instructions: Re   |
|            | TOTAL COMBINED: 188,551.7<br>SCORE TO ACHIEVE ON PERCENTAGES:  | 0 3763   |         |                | calendar year. Submit before expir<br>G. Warranty: Sample of special   |
|            | JORE TO ACHIEVE ON TERCENTAGED.  | 0.0760   |         |                | <ul> <li>I.5 QUALITY ASSURANCE</li> <li>A. Installer Qualifications: A quality</li> <li>I. Installer's Field Supervision:</li> </ul>   |
| **         | Address  | Green Area Ra<br>Ward Lot S                              |         | oning District | IN progress.<br>B. Soil-Testing Laboratory Quali<br>the experience and capability to co  |
| 2.5        | Other / 624 Order ACHIEVE SCORE OF 0.376   | enter sq ft of<br>lot n                                  | ndipl   | R-5-B          | C. Topsoil Analysis: Furnish soil<br>percentages of organic matter; gra<br>deleterious material; pH; and miner   |
|            | Lot size (enter this value , first) *<br>Landscape Elements  | and a  | Factor  | 0.376<br>Total | potassium. Each sample to be sub<br>core samples for each soil area.<br>D. Each soil test shall examine th   |
| A          | Landscaped areas (select one of the following for each area)   |  |         |                | results shall be considered provision<br>and resubmitted for approval by the<br>for suitability with the plants that ar  |
| 1          | Landscaped are as with a soil depth of less than 24"   | entersa ft<br>290  | 0,3     | 87,0           | that require acidic soils for healthy<br>pH Range:<br>Organic Ma   |
| 2          | Landscaped areas with a soil depth of 24" or greater   | entersa jt<br>21,332                                     | 0.6     | 12,799.2       | Calcium: le<br>Magnesium<br>Phosphorus<br>Potassium:   |
| 3          | Bioretention facilities  | entersgft<br>3,281                                       | 0.4     | 1,312.4        | Electrical c   |
| в          | Plantings (credit for plants in landscaped areas from Section A)   |  |         |                |  |
| 1          | Groundcovers, or other plants less than 2' tall at maturity  | entersast<br>2,904                                       | 0.2     | 580.8          | TEXTURE CLASS<br>% SAND (0.05MM - 2.001  |
| 2          | Plants, not including grasses, 2' or taller at maturity - calculated at 9 sq ft per plant (typically planted no closer than 18" on center) | enternumber of plants 4,001 36009                        | 0.3     | 10,802.7       | % SILT (0.002MM - 0.05M<br>% CLAY (<0.002MM)<br>% ORGANIC MATTER (BY WE  |
| 3          | Tree canopy for all new trees 2.5" to 6" diameter<br>or equivalent - calculated at 5D sq ft per tree                                       | enter number of trees                                    | 0,5     | 1,000.0        | PH<br>MACRONUTRIENTS & MICRONU   |
| 4          | Tree canopy for new trees 6" diameter or larger<br>or equivalent - calculated at 250 sq ft per tree  | enter number of brees<br>25 b250                         | 0.6     | 3,750.0        | E. Provide quality, size, genus,<br>Z60.1, "American Standard for Nur  |
| 5          | Tree canopy for preservation of existing tree 6" to 12" diameter   | enter number of trees                                    | 0.7     | 175,0          | I. Selection of trees purchased<br>they are prepared for transplanting<br>F. Tree and Shrub Measurement  |
|            | or larger or equivalent – calculated at 250 sq ft per tree   | enter number of trees                                    |         |                | position. Do not prune to obtain recall per size, and 12 inches above to measure branches or roots tip-to-t  |
| 6          | Tree canopy for preservation of existing tree 12" to 18" diameter<br>or larger or equivalent – calculated at 600 sq ft per tree            | 1 600  | 0.7     | 420,0          | G. Observation: Architect may with requirements for genus, species size and condition of balls and root  |
| 7          | Tree canopy for preservation of all existing trees 18" to 24" dia.<br>or equivalent - calculated at 1300 sq ft per tree                    | enter number of trees<br>2 2600<br>enter number of trees | 0.7     | 1,820.0        | at any time during progress of wor<br>I. Notify Architect of sources of<br>H. Preinstallation Conference: (<br>I.6 DELIVERY, STORAGE, AND H                                    |
| 8          | Tree canopy for preservation of all existing trees 24" diameter<br>or larger or equivalent – calculated at 2000 sq ft per tree             | 2 4000   | 0.8     | 3,200.0        | A. Deliver exterior plants freshly<br>B. Do not prune trees and shrul<br>from sun scald, drying, sweating, v   |
| 9          | Vegetated wall, plantings on a vertical surface  | enter sa jt  | 0.6     | 3              | a manner as to destroy their natura<br>plants during delivery and handling.<br>C. Handle planting stock by roo<br>D. Deliver exterior plants after p                           |
|            |  |  |         |                | more than six hours after delivery,<br>roots moist.  |
| C          | Over at least 2" and less than 8" of growth medium   | entersa ft<br>8 597                                      | DE      | 5155.3         | <ol> <li>Set balled stock on ground a</li> <li>Do not remove container-gro</li> <li>Water root systems of exter</li> </ol>   |
| Ţ          | Over at least 2" and less than 8" of growth medium   | 8,592<br>entersaft                                       | 0.6     | 5,155.2        | systems in a moist condition.<br>1.7 PROJECT CONDITIONS<br>A. Planting Restrictions: Plant of  |
| 2          | Over at least 8" of growth medium  | 0  | 0.8     | 4              | provide required maintenance from<br>1. Spring Planting: Immediately<br>2. Fall Planting: August 15 unti   |
| D          | Permeable Paving***  |  |         |                | 3. Note: Different plant types re<br>to determine the proper time, base<br>minimize stress on the plant.   |
| 1          | Permeable paving over at least 6" and less than 24" of soil or gravel  | entersa ft 54,453  | 0.4     | 21,781.2       | <ul> <li>B. Weather Limitations: Procee</li> <li>performed according to manufactur</li> <li>C. Coordination with Lawns: Place</li> </ul>                                       |
|            |  | enter sqft   | 85      | -              | otherwise acceptable to Architect.<br>I. When planting trees and shru  |
| 2<br>E     | Permeable paving over at least 24" of soil or gravel Other   | 0  | 0,5     | ÷              | 1.8 WARRANTY<br>A. Special Warranty: Installer's<br>materials, workmanship, or growth  |
| 1          | Enhanced tree growth systems***  | enter sq ft  | 0.4     | 1              | <ul> <li>Failures include, but are not l</li> <li>a. Death and unsatisfactory gro</li> <li>or incidents that are beyond Contr</li> </ul>                                       |
|            |  | enter sq ft  | and a   |                | <ul> <li>b. Structural failures including p</li> <li>2. Warranty Periods from Date</li> <li>a. Trees and Shrubs: One year</li> </ul>   |
| 2          | Renewable energy generation  | 8,194  | 0.5     | 4,097.0        | <ul> <li>b. Ground Cover and Plants: O</li> <li>3. Include the following remedia</li> <li>a. Remove dead exterior plants</li> <li>b. Replace exterior plants that a</li> </ul> |
| 3          | Approved water features  | entersqft<br>0   | 0.2     | -              | c. A limit of one replacement of with requirements.<br>d. Provide extended warranty for  |
| н          | Bonuses  | sup-total of sqft = 250,755                              |         | - 1            | I.9 MAINTENANCE SERVICE<br>A. Initial Maintenance Service fo<br>Maintain as required in Part 3. Bea  |
| 1          | Native plant species   | entersq/t<br>25,570                                      | 0.1     | 2,557.0        | acceptably healthy and well establis<br>1. Maintenance Period: From the<br>assumes control of the site.  |
|            |  | entersq ft   |         |                |  |
| 2          | Landscaping in food cultivation  | 5,412<br>entersaft                                       | 0,1     | 541.2          |  |
|            |  | 0  | 0.1     |                |  |

DD0E/WPD 06/2014

### ENERAL TED DOCUMENTS

ings and general provisions of the Contract, including General and Supplementary Conditions and Division 1

on Sections, apply to this Section. MARY

ion 2 Section "Site Clearing" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site ion 2 Section "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage

ion 2 Section "Lawns and Grasses" for lawn and meadow planting.

IITIONS fill: The earth used to replace or the act of replacing earth in an excavation.

d and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not liameter and depth recommended by ANSI Z60. I for type and size of tree or shrub required; wrapped, tied, rigidly , and drum laced as recommended by ANSI Z60.1 d and Potted Stock: Exterior plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, her. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of exterior plant

ainer-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root ching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of exterior plant Grade: Elevation of finished surface of planting soil.

ufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil s to produce topsoil or planting soil. -Stem: Where three or more main stems arise from the ground from a single root crown or at a point right above the

ing Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil rade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before ing soil. oil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

MITTALS luct Data: For each type of product indicated.

fication Data: For qualified landscape Installer. luct Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

ufacturer's certified analysis for standard products. ysis of other materials by a recognized laboratory made according to methods established by the Association of Official Chemists, where applicable.

rial Test Reports: For existing surface soil and imported topsoil. ing Schedule: Indicating anticipated planting dates for exterior plants.

cenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a ear. Submit before expiration of required maintenance periods. anty: Sample of special warranty.

LITY ASSURANCE

Iller Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants. Iller's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is

Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with nce and capability to conduct the testing indicated and that specializes in types of tests to be performed. oil Analysis: Furnish soil analysis by a qualified soil-testing laboratory (eg. The Pennsylvania State University), stating s of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; material; pH; and mineral and plant-nutrient content of topsoil, including total calcium, magnesium, phosphorus, and Each sample to be submitted for testing shall be extracted from a composite sample representing a minimum of five es for each soil area.

soil test shall examine the following chemical and physical attributes. Any soil that falls within the indicated range of I be considered provisionally acceptable. Soil that falls outside any of the indicated ranges may be amended, retested, nitted for approval by the Owner. Once a soil is considered provisionally acceptable, its pH level should be examined ty with the plants that are to be grown on the site. Special attention should be paid to the pH tolerances of plants acidic soils for healthy growth

pH Range: 6.0-7.2 Organic Matter: 5 % +

Calcium: less than 175 units or 3,000 pounds per acre.

Magnesium: 26-50 units or 71-124 pounds per acre. Phosphorus: 26-50 units or 62-102 pounds per acre

Potassium: 26-50 units or 85-160 pound per acre Electrical conductivity: 600 ppm or .4 mmhos/cm (.4 dS)

IMPROVEMENT SPECIFICATION (TOPSOIL)

| CHARACTERISTIC             | TEST METHOD      | REQUIRED STANDARD   |
|----------------------------|------------------|---|
| TEXTURE CLASS              |                  | LOAM, SILT LOAM, SANDY CLAY LOAM,<br>SANDY LOAM, CLAY LOAM    |
| AND (0.05MM - 2.00MM)      | HYDROMETER       | <70%  |
| ILT (0.002MM - 0.05MM)     | HYDROMETER       | <70%  |
| % CLAY (<0.002MM)          | HYDROMETER       | <30%  |
| GANIC MATTER (BY WEIGHT)   | LOSS OF IGNITION | LAWN AREAS (4-6%),<br>PLANTING BEDS (5-7%)                    |
| рН                         |                  | 6.0-7.2, SPECIFIC PLANTINGS MAY<br>REQUIRE ALTERNATIVE VALUES |
| IUTRIENTS & MICRONUTRIENTS |                  | DETERMINED BY PROFESSIONAL SOIL<br>SCIENTIST                  |

Ide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI nerican Standard for Nursery Stock." ction of trees purchased for the Project will be made by Architect, who will tag trees at their place of growth before

epared for transplanting and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal To not prune to obtain required sizes. Take caliper measurements 6 inches above the ground for trees up to 4-inch , and 12 inches above the ground for larger sizes. Measure main body of tree or shrub for height and spread; do not anches or roots tip-to-tip.

ervation: Architect may observe trees and shrubs either at place of growth or at site before planting for compliance ements for genus, species, variety, size, and quality. Architect retains right to observe trees and shrubs further for indition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material during progress of work. Remove rejected trees or shrubs immediately from Project site. Architect of sources of planting materials 30 days in advance of delivery to site.

stallation Conference: Conduct conference at Project site. /ERY, STORAGE, AND HANDLING

ot prune trees and shrubs before delivery except as approved by Architect. Protect bark, branches, and root systems cald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior ng delivery and handling.

er exterior plants after preparations for planting have been completed and install immediately. If planting is delayed six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep

balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material. ot remove container-grown stock from containers before time of planting. root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root a moist condition.

IECT CONDITIONS ing Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to juired maintenance from date of Substantial Completion.

ig Planting: Immediately after danger of frost has passed, until June 15. lanting: August 15 until December

Different plant types require different planting times and conditions. A professional horticulturalist shall be consulted ne the proper time, based on plant species and weather conditions, to move and install particular plant material to ress on the plant. ther Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be

according to manufacturer's written instructions and warranty requirements. rdination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns unless acceptable to Architect. i planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

RANTY cial Warranty: Installer's standard form in which Installer agrees to repair or replace plantings and accessories that fail in workmanship, or growth within specified warranty period. res include, but are not limited to, the following:

and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, 5 that are beyond Contractor's control. ctural failures including plantings falling or blowing over.

anty Periods from Date of Substantial Completion:

and Shrubs: One year. nd Cover and Plants: One year.

de the following remedial actions as a minimum:

ove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season. ace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period. it of one replacement of each exterior plant will be required except for losses or replacements due to failure to comply ements. ide extended warranty for replaced plant materials; warranty period equal to original warranty period.

ITENANCE SERVICE I Maintenance Service for all plant material: Provide full maintenance by skilled employees of landscape Installer.

required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are healthy and well established, but for not less than maintenance period below.

cenance Period: From the time Landscape Installation begins until all Landscape Installation is complete and Owner ontrol of the site.

in size of roots or balls. according to ANSI Z60.1. Root flare shall be visible before planting. designation of botanical and common name. number label to assure symmetry in planting. 2.2 SHADE AND FLOWERING TREES

with ANSI Z60. I

PART 2 - PRODUCTS

complying with ANSI Z60.1 for type of trees required. Provide balled and burlapped trees. Branching Height: One-half of tree height. Small Upright Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows: Stem Form: Multi-trunk clump. Provide balled and burlapped trees. 2.3 DECIDUOUS SHRUBS A. Form and Size: Shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub. I. Shrub sizes indicated are sizes after pruning. Provide balled and burlapped or container-grown shrubs. 2.4 BROADLEAF EVERGREENS

B. Form and Size: Specimen quality as described. Shearing Designation: Natural, never sheared. Provide balled and burlapped or container-grown material. 2.5 GROUND COVER PLANTS A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1 2.6 PLANTS

with requirements in ANSI Z60.1. 2.7 TOPSOIL A. Topsoil: ASTM D 5268, pH range of 6.0-7.2, a minimum of 5 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth. a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources. Obtain topsoil displaced

from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes. 2.8 ORGANIC SOIL AMENDMENTS A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

Organic Matter Content: 50 to 60 percent of dry weight.

2.9 FERTILIZER A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition: . For trees, shrubs, and groundcovers: Composition should be 10 percent nitrogen, 6 percent phosphorous, and 4 percent potassium, by weight For perennials: Fertilizer should be a complete fertilizer that is slow-released. 2.10 MULCHES

following: 2.11 TREE STABILIZATION MATERIALS A. Stakes and Guys:

tree trunks from damage. with two 3/8-inch galvanized eyebolts.

PART 3 - EXECUTION 3.1 EXAMINATION performance. 3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations. B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Install secured biodegradeable erosion control netting on all slopes of 30 percent or greater.

site.

3.3 PLANTING BED ESTABLISHMENT and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

remove ridges, and fill depressions to meet finish grades.

3.4 EXCAVATION FOR TREES AND SHRUBS A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation. Excavate approximately three times as wide as ball diameter for balled and burlapped and container-grown stock. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock. If drain tile is shown or required under planted areas, excavate to top of porous backfill over tile. Subsoil removed from excavations may be used as backfill if it is suitable.

Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations. I. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is

less, and backfill with free-draining material. 3.5 TREE AND SHRUB PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60. I B. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball one-eighth the depth of the ball above finish grades. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls.

Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation. 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

C. Set balled and potted and container-grown stock plumb and in center of pit or trench with top of root ball 2 inches above finish grades. Carefully remove root ball from container without damaging root ball or plant. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix. D. Organic Mulching: Apply 2-3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or

trench. 3.6 TREE AND SHRUB PRUNING 3.7 TREE STABILIZATION

A. Trunk Stabilization: Where indicated, provide trunk stabilization as follows: Upright Staking and Tying: Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend dimension shown above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. B. Guying and Staking: Guy and stake trees exceeding 14 feet in height and more than 3 inches in caliper unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade.

3.9 PLANTING BED MULCHING place mulch against plant stems. 3.10 PLANT MAINTÉNANCE 3.11 CLEANUP AND PROTECTION

| 9 | 10 | 11 | 12         |
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2.1 TREE AND SHRUB MATERIAL A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement. B. Provide trees and shrubs of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of

trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Architect, with a proportionate increase C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare

D. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible F. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated,

A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, complying

A. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying

Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent. Wood Derivatives (Pine Fines): Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture,

free of chips, stones, sticks, soil, or toxic materials. Must contain a minimum of 75 percent sawdust-size and dust-size particles Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the Type: Shredded hardwood, applied to depth of 2-3".

I. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.

Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter. Hose Chafing Guards: Reinforced rubber or plastic hose at least 1/2 inch in diameter, cut to lengths required to protect

5. Guy Cables: 5-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, 6. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and

B. Proceed with installation only after unsatisfactory conditions have been corrected.

If specified plant material is unavailable, Landscape Architect must approve substitutions BEFORE plants are brought to the

E. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before planting. Make minor adjustments as required. A. Loosen subgrade of entire planting bed to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension

Apply fertilizer directly to subgrade before loosening, except when compost is used. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix over entire bed. Delay mixing fertilizer with planting soil if planting will not proceed within a few days. Spread planting soil mix over entire bed to a depth of 12 inches minimum but not less than required to meet finish grades

after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Total depth of loosened and prepared planting beds must be a minimum 12 inches. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake,

Before planting, restore planting beds if eroded or otherwise disturbed after finish grading.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

Fill excavations with water and allow to percolate away before positioning trees and shrubs.

Remove only dead, dying, or broken branches. Do not prune for shape.

3.8 GROUND COVER AND PLANT PLANTING A. Set out and space ground cover and plants as indicated. Landscape Architect to approve layout before planting. Dig holes large enough to allow spreading of roots and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover plant crowns with wet soil. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

A. Mulch backfilled surfaces of planting beds and other areas indicated. Organic Mulch: Apply 2-3-inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not

A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, adjusting and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease. B. Ground Cover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings. A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally

MAINTENANCE PLAN

SOILS AND AMENDMENTS

material source.

- Decompaction or air tilling to ameliorate compaction.
- Rate and application schedule Mulch - Apply yearly or as necessary to replace decomposed mulch.
- the depth applied.
- Material source

• Compost should be well-decomposed material, stable, free of weeds, contaminants and foul odors. Compost may be derived from yard waste (decomposed leaves, grass clippings, branches) or food waste. • Mulch can be derived from organic sources such as shredded bark, or leaf mulch.

BIORETENTION

Stormwater Management Guidebook. NEW AND EXISTING PLANTINGS

All Plantings

- and sunlight.
- Replace mulch every 2-3 years, or as necessary to recommended depth (see below).
- management (IPM) approach if possible.

Trees and Shrubs

- plants have established.

- Zone.

Perennials and Groundcovers

 Periodically divide perennials as necessary to encourage rejuvenated growth. • Spread mulch at a maximum 2-inch depth.

15

Soil maintenance plans should provide guidance for: soil amendment application rate, schedule of work, and

Decompact topsoil by tilling or subsoiling and incorporating compost throughout the depth of compacted soil. Do not till soils underneath existing trees; instead consider practices such as mulching under the canopy

• Compost - Apply compost yearly at a depth of 1-2 inches. Coarse textured sand and clay soils require greater compost addition than loamy soils. The organic matter content of the chosen compost will influence • Fertilizer - Apply fertilizer only after incorporating compost into topsoil and conducting a soil test. This will avoid over-application of nutrients, as compost itself will increase the nutrient content.

Maintenance criteria for bioretention can be found in Chapter 3.6.7 (pp. 124-126) of the DDOE 2013

• Provide supplemental watering if rainfall is less than 1 inch per week during the first two growing seasons. • Conduct weeding as necessary to reduce competition between weeds and plantings for nutrients, soil moisture,

• Monitor the plantings for disease or stress and modify cultural practice as necessary. Employ an integrated pest

• Remove dead plant material and replant in the next appropriate growing season.

• For trees, install slow leak watering bags or tree buckets during the first two growing seasons. Water as necessary to supplement precipitation if less than 1 inch per week. Remove watering bags or tree buckets after

• Inspect trees for signs of dead, diseased, or crossing branches and prune accordingly. Remove hazard limbs from established trees. Never remove more than 20% of the tree canopy during pruning activities in any year. • Spread mulch at a maximum 3-inch depth and ensure mulch is not against the trunk of the tree. • Maintain tree health by limiting all grade changes and other soil disturbance underneath the tree's Critical Root

In the early spring, deadhead top-growth from perennials and warm-season grasses.

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KEY PLAN

CONSTRUCTION DOCUMENTS 08/01/201

|     | REVISIONS   |      |
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| Ο | LEGEND   |
|---|--|
|   | LANDSCAPE AREAS SOIL<br>DEPTH <24": O SQ. FT.<br>LANDSCAPE ELEMENT A I   |
| Ν | LANDSCAPE AREAS SOIL<br>DEPTH >24": 1,550 SQ. FT.<br>LANDSCAPE ELEMENT A2  |
|   | BIORETENTION: 558 SQ. FT.<br>LANDSCAPE ELEMENT A3<br>SEE CIVIL FOR DETAILS   |
| М | GREEN ROOF: 688 SQ. FT.<br>LANDSCAPE ELEMENT CI<br>SEE ARCH FOR DETAILS  |
|   | E GEOTURF: O SQ. FT.<br>+ + + + + + + + + + + + + + + + + + +  |
| L | PERMEABLE PAVING: 188 SQ. FT.<br>LANDSCAPE ELEMENT D I   |
|   | SOLAR PANELS: 383 SQ. FT.<br>LANDSCAPE ELEMENT E2<br>SEE ARCH FOR DETAILS  |
| К |  |
|   | NOTE:<br>I. TEMPORARILY INSTALLED SOAKER HOSES<br>PLACED ACROSS ENTIRE GREEN ROOF AREA<br>TO PROVUDE AUTOMATIC WATERING ONCE A                               |
| J | TO PROVIDE AUTOMATIC WATERING ONCE A<br>WEEK FOR THE FIRST FOUR (4) WEEKS FROM<br>HOSE BIB LOCATIONS AND THEN MANUALLY<br>CHECKED WEEKLY BY DCPS MAINTENANCE |
|   | FOR AS-NEEDED WATERING DURING THE ONE<br>YEAR INSTALLATION PERIOD.   |
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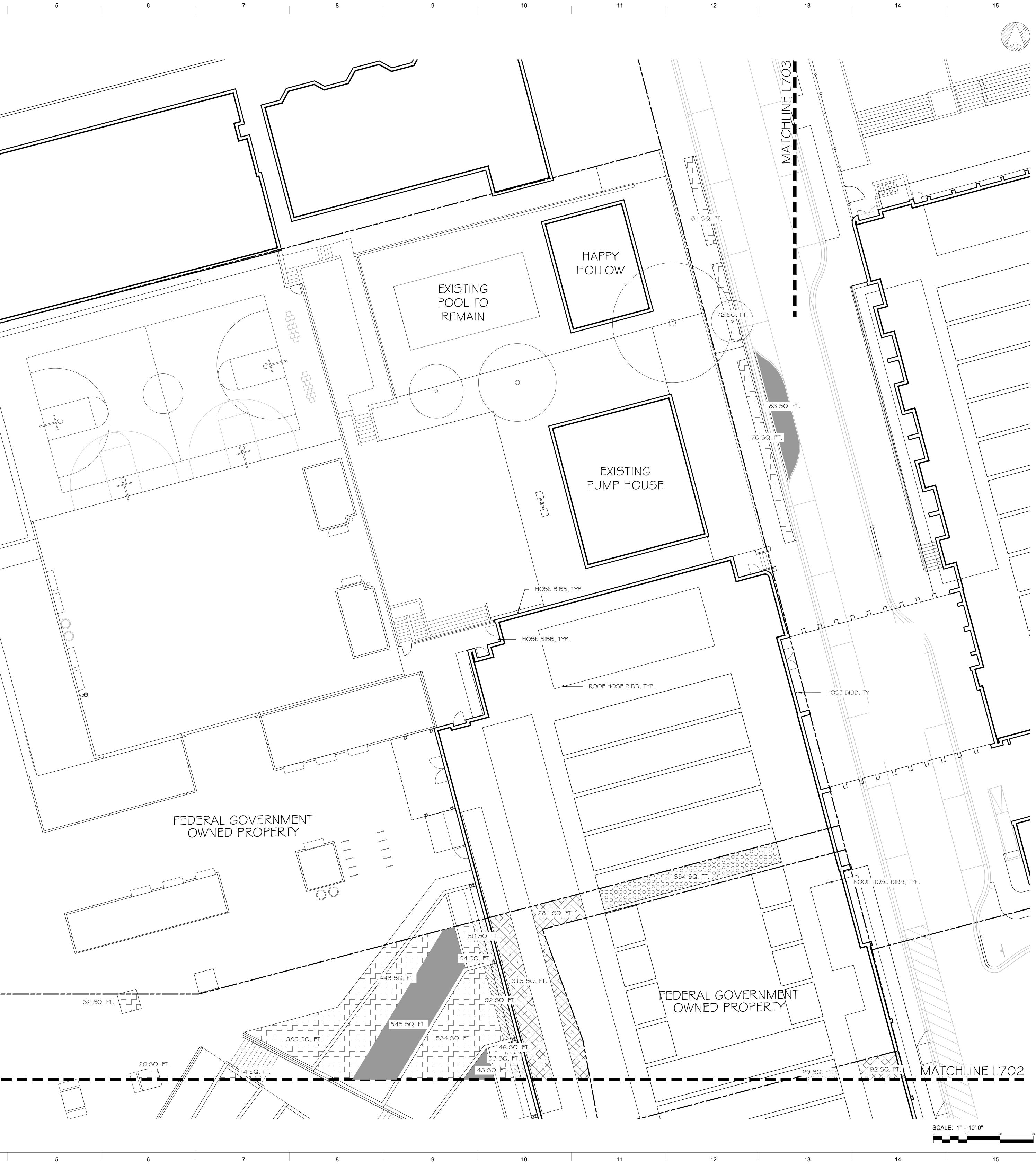
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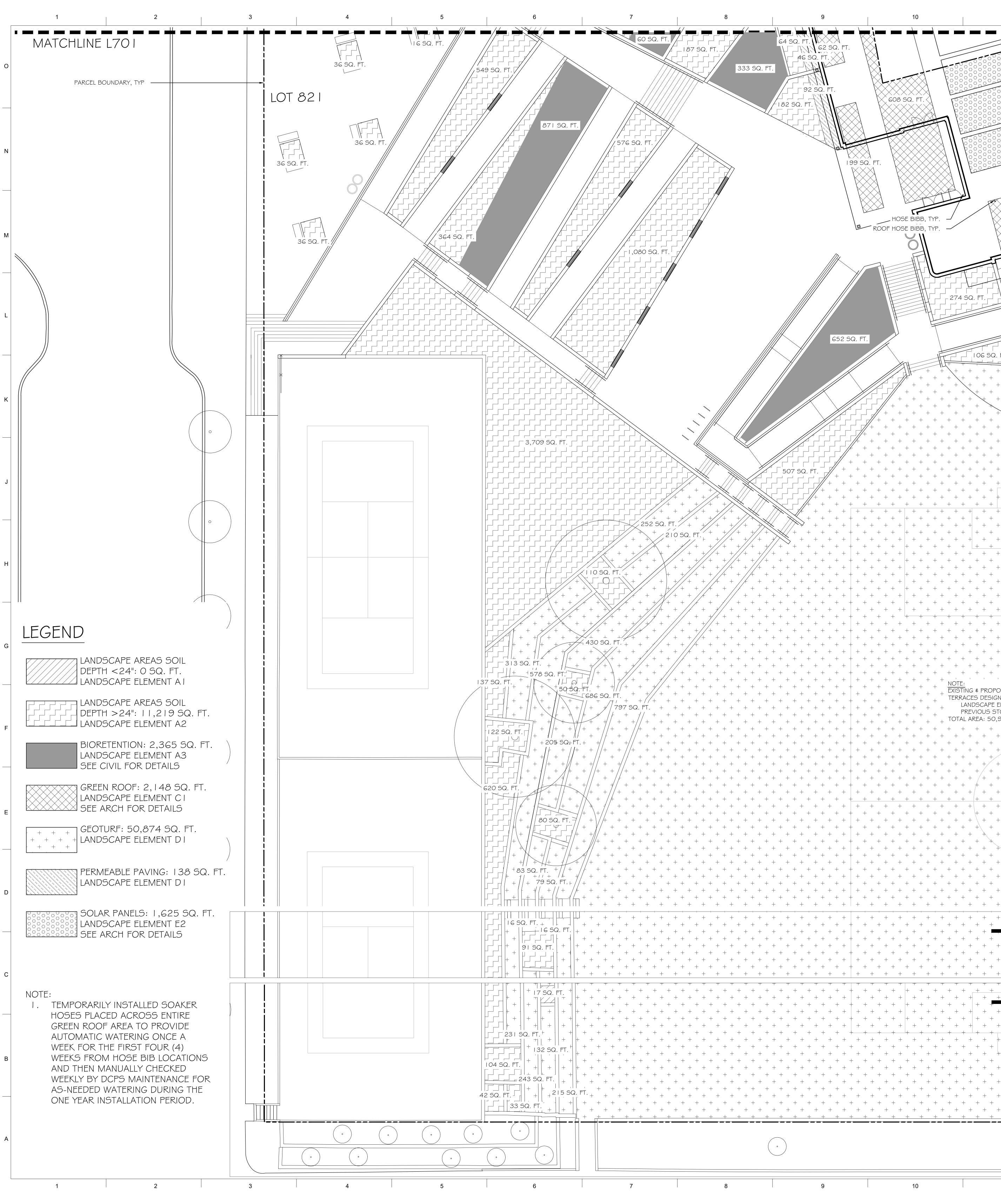
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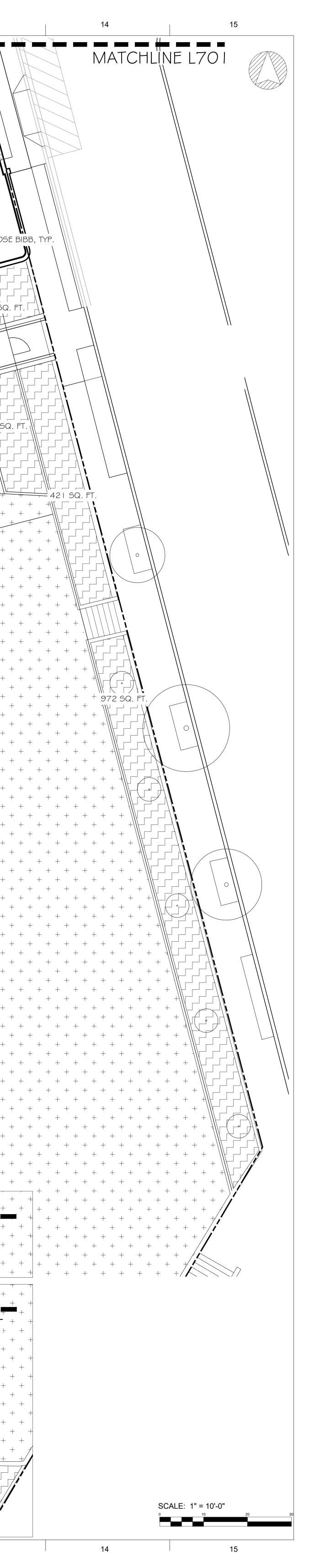
KEY PLAN

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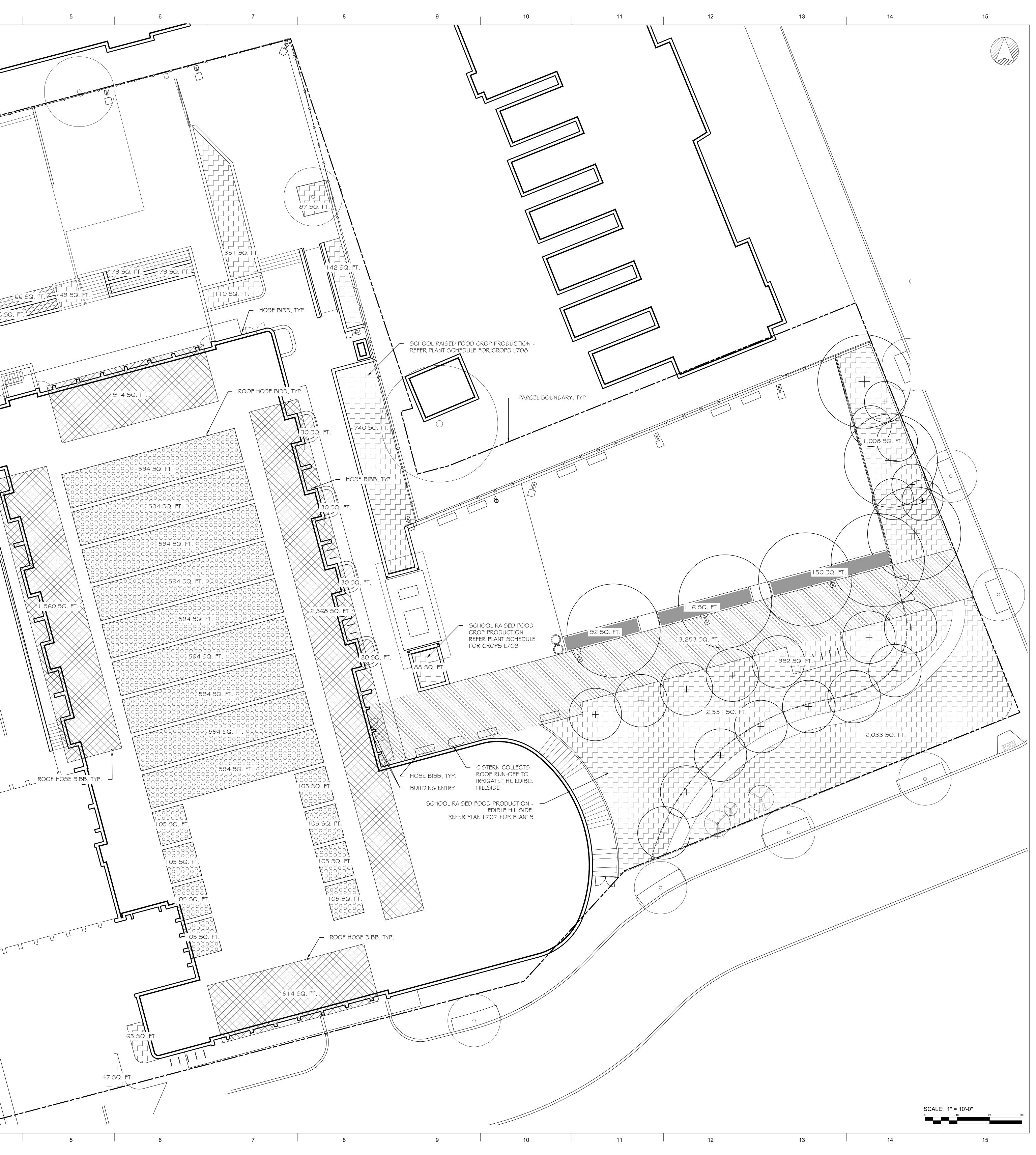
13 62 SQ. FT. 365 SQ.  $\times \times >$ 594 SQ. FT  $I \in \mathcal{X} \setminus L$ 608 SQ. FT. 594 SQ. FT 199 SQ. FT.  $\times$   $\times$   $\land$ HOSE BIBB, TYP. ROOF HOSE BIBB, TYP. 209 SQ. FT 274 SQ. 250 SQ. F1 652 SQ. FT. 449 SQ. FT. 106 SQ. FT EXISTING & PROPOSED SYNTHETIC TURF SOCCER FIELD (46,291 SQ. F FERRACES DESIGNED AS PERMEABLE PAVING (4,649 SQ. FT.) LANDSCAPE ELEMENT D I PREVIOUS STORMWATER MANAGEMENT APPROVAL - #3603 TAL AREA: 50,940 SQ. FT. <sup>\_\_</sup> 203 SQ. FT. 11 13



PROFESSIONAL STAMP DPR PLAZA KEY PLAN CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS NO. DESCRIPTION DATE \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ L702

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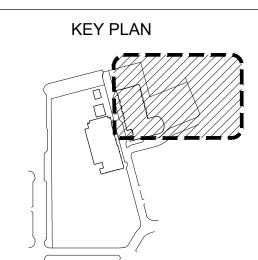
| <ul> <li>LEGEND</li> <li>LANDSCAPE AREAS SOIL<br/>DEPTH &lt;24": 290 SQ. FT.<br/>LANDSCAPE ELEMENT A I</li> <li>LANDSCAPE AREAS SOIL<br/>DEPTH &gt;24": 8,563 SQ. FT.<br/>LANDSCAPE ELEMENT A2</li> <li>BIORETENTION: 358 SQ. FT.<br/>LANDSCAPE ELEMENT A3<br/>SEE CIVIL FOR DETAILS</li> <li>GREEN ROOF: 5,756 SQ. FT.</li> </ul> |            |
|--|------------|
| N<br>BIORETENTION: 358 SQ. FT.<br>LANDSCAPE ELEMENT A3<br>SEE CIVIL FOR DETAILS  | X          |
| BIORETENTION: 358 SQ. FT.<br>LANDSCAPE ELEMENT A3<br>SEE CIVIL FOR DETAILS   |            |
| REFNIROOF, 5750 SO FT  |            |
| M GREEN ROOT: 5,756 SQ. TT.  |            |
| GEOTURF: O SQ. FT.<br>+ + + + + + LANDSCAPE ELEMENT D I  |            |
| L PERMEABLE PAVING: 3,253 SQ. FT.  | 663        |
| SOLAR PANELS: 6, 186 SQ. FT.<br>LANDSCAPE ELEMENT E2<br>SEE ARCH FOR DETAILS   | 66 SQ. FT. |
| κ  |            |
| IRRIGATION NOTES:<br>I. TEMPORARILY INSTALLED SOAKER<br>HOSES PLACED ACROSS ENTIRE<br>GREEN ROOF AREA TO PROVIDE   |            |
| AUTOMATIC WATERING ONCE A WEEK<br>FOR THE FIRST FOUR (4) WEEKS FROM<br>HOSE BIB LOCATIONS AND THEN<br>MANUALLY CHECKED WEEKLY BY DCPS  |            |
| MAINTENANCE FOR AS-NEEDED<br>WATERING DURING THE ONE YEAR<br>INSTALLATION PERIOD.<br>2. STUDENT CROP CULTIVATION AREAS<br>SHALL BE IRRIGATED MANUALLY BY   |            |
| HOSE FROM HOSE BIB LOCATION<br>ADJACENT TO RAISED BEDS ON A<br>DAILY BASIS DURING GROWING<br>SEASONS.  |            |
| 3. STUDENT CULITIVATION - EDIBLE<br>HILLSIDE SHALL BE IRRIGATED<br>MANUALLY BY HOSE FROM CISTERN<br>ON A DAILY BASIS DURING GROWING  |            |
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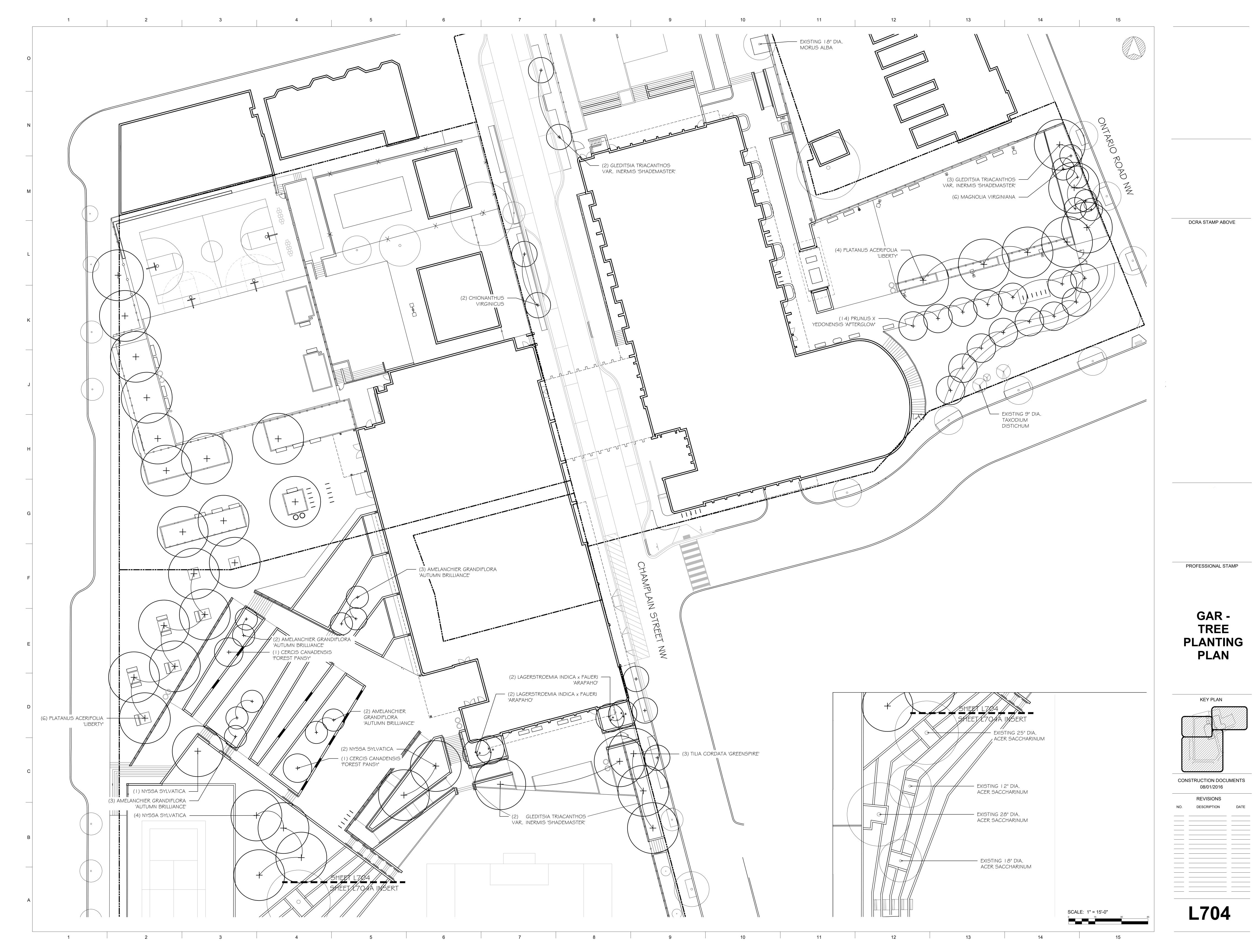


CONSTRUCTION DOCUMENTS 08/01/2016



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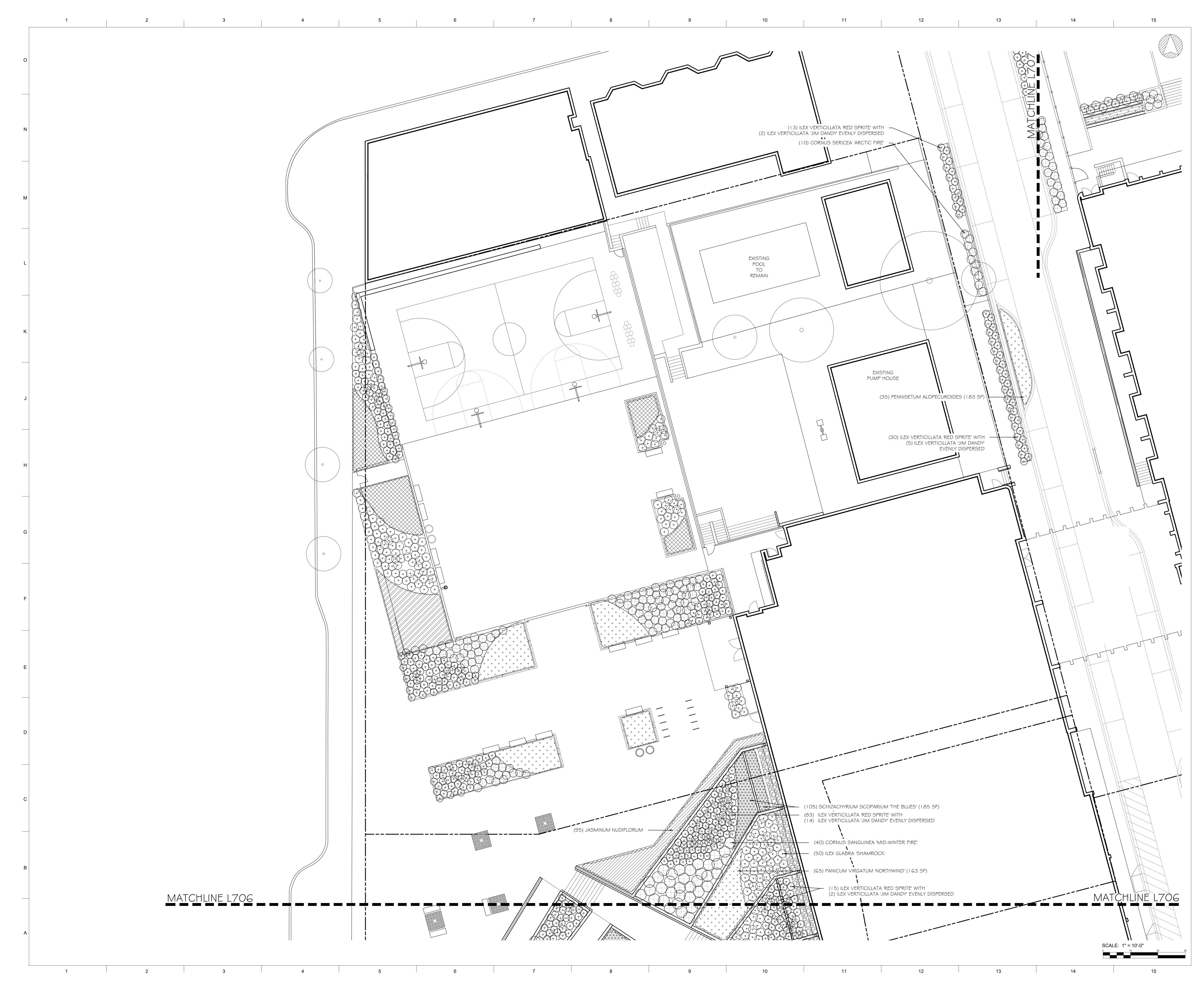
L703



PROFESSIONAL STAMP GAR -TREE PLANTING PLAN KEY PLAN CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS NO. DESCRIPTION DATE \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_

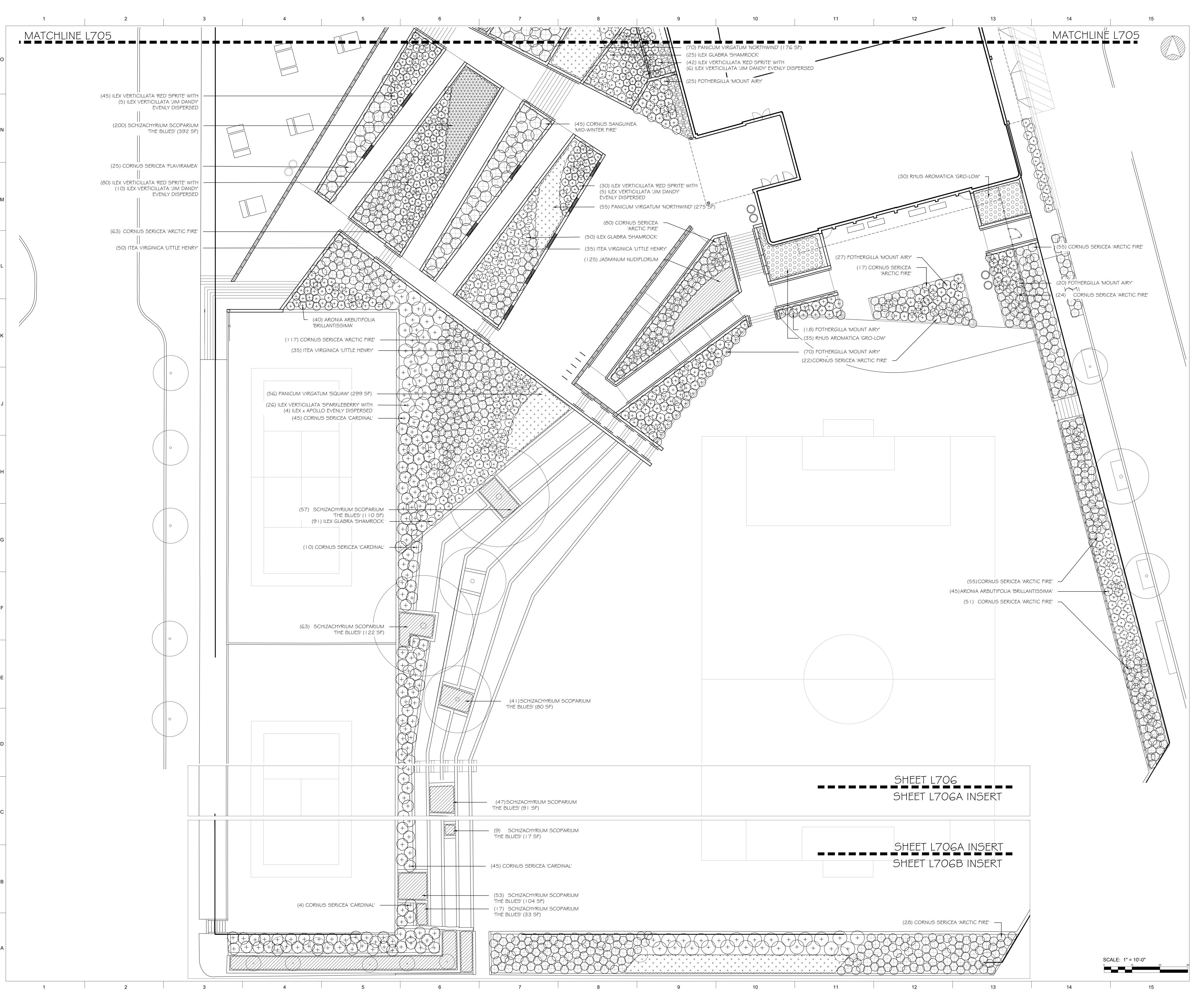
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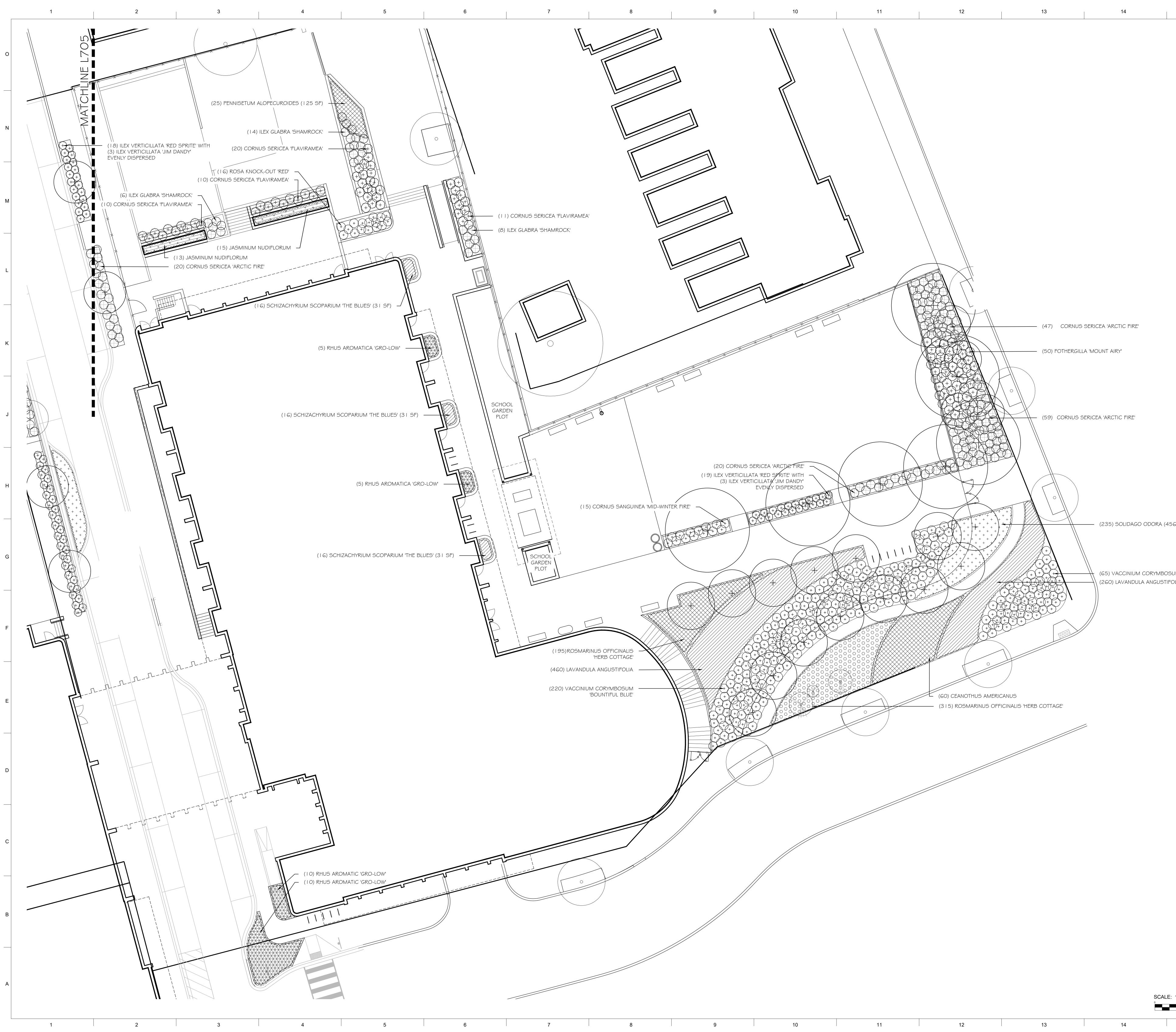


PROFESSIONAL STAMP GAR -**ENTRY PLAZA** PLAYGROUND PLANTING PLAN KEY PLAN CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS DESCRIPTION DATE NO. \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ -----\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ -----\_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ L705

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DCRA STAMP ABOVE PROFESSIONAL STAMP PLAZA PLANTING PLAN KEY PLAN CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS NO. DESCRIPTION DATE \_\_\_\_\_ \_\_\_\_\_ \_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ **L706** 



— (235) SOLIDAGO ODORA (456 SF)

(65) VACCINIUM CORYMBOSUM 'SUNSHINE BLUE' (260) LAVANDULA ANGUSTIFOLIA

SCALE: 1" = 10'-0'

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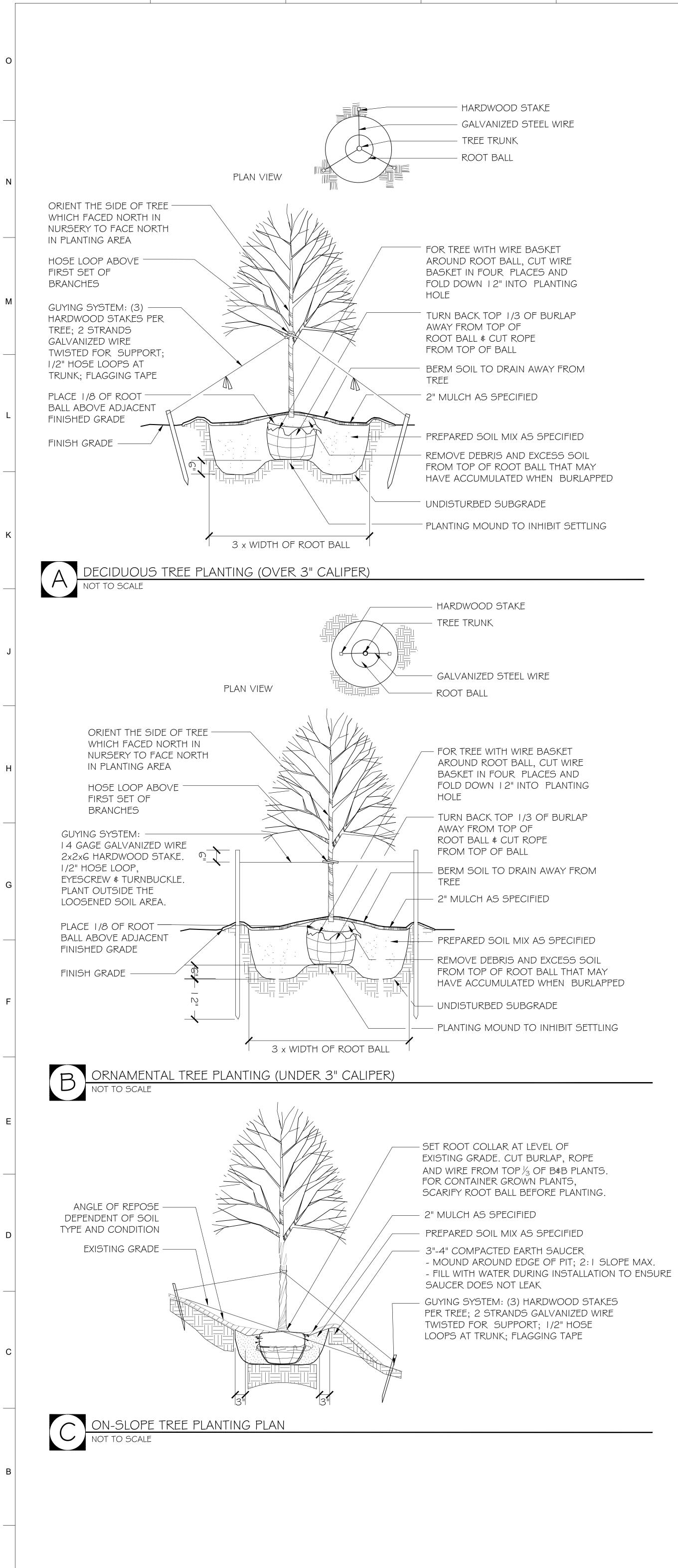


KEY PLAN

CONSTRUCTION DOCUMENTS 08/01/2016

|     | REVISIONS   |      |
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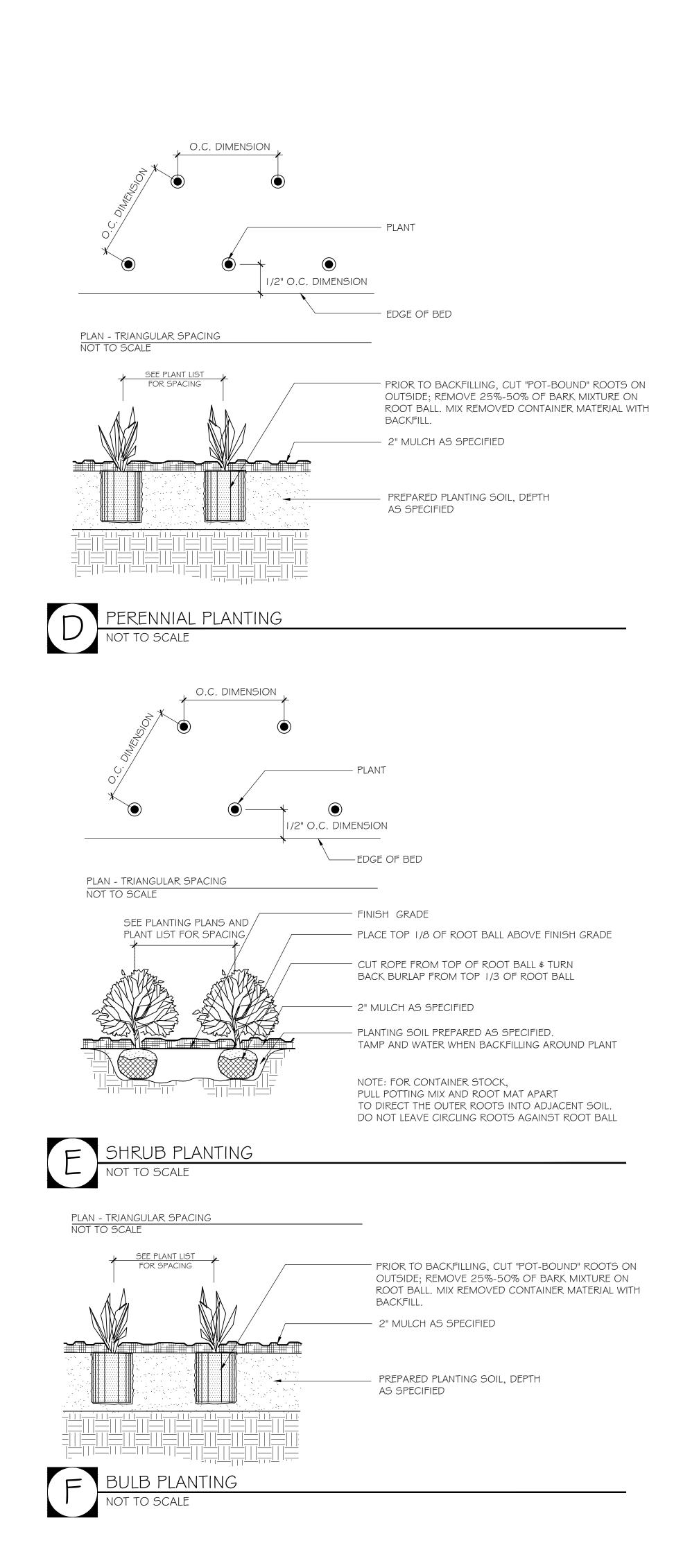
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| RTY.     | BOTANICAL/COMMON NAME   | SIZE          | SPACING  | REMARKS   | NATIVE   | GAR<br>LANDSCAI<br>ELEMEN1 |
|----------|---|---------------|----------|---|----------|----------------------------|
| SF       | IADE TREES  |               |          |   |          |                            |
| 5        | GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'<br>Shademaster Thornless Honey Locust | 6" cal.       | As Shown | Strong Single Leader/Specimen   | YES      | B4                         |
| 2        | GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'<br>Shademaster Thornless Honey Locust | 3-3 1/2" cal. | As Shown | Strong Single Leader/Specimen   | YES      | B3                         |
| 7        | NYSSA SYLVATICA<br>Blakgum  | 6" cal.       | As Shown | Strong Single Leader/Specimen   | YES      | B4                         |
| 10       | PLATANUS ACERIFOLIA 'LIBERTY'<br>Liberty London Plane Tree                        | 6" cal.       | As Shown | Strong Single Leader/Specimen   | NO       | B4                         |
| 3        | TILIA CORDATA 'GREENSPIRE'<br>Littleleaf Linden                                   | 6" cal.       | As Shown | Strong Single Leader/Specimen   | YES      | B4                         |
| OF       | RNAMENTAL TREES   |               |          | Multistemmed Specimen, 3 - 5 Canes,   |          |                            |
| 10       | AMELANCHIER x GRANDIFLORA 'AUTUMN BRILLIANCE'<br>Apple Serviceberry               | 8-10' heavy   | As Shown | Full Match Specimen, 1.6" min. per<br>cane  | NO       | B3                         |
| 2        | CERCIS CANADENSIS 'FOREST PANSY<br>Eastern Redbud                                 | 10' ht.       | As Shown | Strong Single Leader/Specimen, Tree<br>Form, 2.5" min.                            | YES      | B3                         |
| 2        | CHIONANTHUS VIRGINICUS<br>White Fringetree  | 8-10' heavy   | As Shown | Strong Single Leader/Specimen, Tree<br>Form, 2.5" min.                            | YES      | B3                         |
| 4        | LAGERSTROEMIA INDICA x FAUERI 'ARAPAHO'<br>Red Crape Myrtle                       | 8-10' heavy   | As Shown | Multistemmed Specimen, 3 - 5 Canes,<br>Full Match Specimen, 1.6" min. per         | NO       | B3                         |
| 6        | MAGNOLIA VIRGINIANA   | 8-10' heavy   | As Shown | cane<br>Multistemmed Specimen, 3 - 5 Canes,<br>Full Match Specimen, 1.6" min. per | YES      | B3                         |
|          | Sweetbay Magnolia<br>PRUNUS x YEDONENSIS 'AFTERGLOW'                              |               |          | cane  |          |                            |
| 14       | Afterglow Yoshino Cherry  | 2- 4' heavy.  | As Shown | Strong Single Leader/Specimen, Tree<br>Form, 2.5" min.                            | NO       | B3                         |
| SF<br>85 | IRUBS<br>ARONIA ARBUTIFOLIA 'BRILLANTISSIMA'                                      | 24.3C" ht     | 36" 0 0  |   | YES      | B2                         |
|          | Red Chokeberry<br>CEANOTHUS AMERICANUS  | 24-36" ht.    | 36" O.C. |   | YES      | B2                         |
| 60<br>76 | New Jersey Tea<br>CORNUS SERICEA 'FLAVIRAMEA'                                     | 24-36" ht.    | 36" O.C. |   | YES      | B2                         |
|          | Yellow Twig Dogwood<br>CORNUS SANGUINEA 'MID-WINTER FIRE'                         | 36" ht.       | 48" O.C. |   | NO       | B2                         |
| 00<br>   | Blood Twig Dogwood<br>CORNUS SERICEA 'ARCTIC FIRE'                                | 48" ht.       | 48" O.C. |   | NO       | B2                         |
|          | Red Twig Dogwood<br>CORNUS SERICEA 'CARDINAL'                                     | 36" ht.       | 36" O.C. |   | YES      | B2                         |
| 04       | Red Twig Dogwood<br>FOTHERGILLA 'MOUNT AIRY'                                      | 48" ht.       | 48" O.C. |   | YES      | B2                         |
| .10      | Mount Airy Fothergilla<br>ILEX GLABRA 'SHAMROCK'                                  | 30" ht.       | 36" O.C. |   | NO       | B2                         |
| 244      | Inkberry<br>ILEX x 'APOLLO'   | 24-36" ht.    | 36" O.C. |   | YES      | B2                         |
| 4        | Winterberry<br>ILEX VERTICILLATA 'JIM DANDY'                                      | 36" ht.       | 60" O.C. |   | NO       | B2                         |
| 55       | Winterberry<br>ILEX VERTICILLATA 'RED SPRITE'                                     | 18" ht.       | 30" O.C. |   | YES      | B2                         |
| 75       | Winterberry<br>ILEX VERTICILLATA 'SPARKLEBERRY'                                   | 18" ht.       | 30" O.C. |   | YES      | B2                         |
| 26       | ITEA VIRGINICA 'LITTLE HENRY'   | 36" ht.       | 60" O.C. |   | NO       | B2                         |
| 20       | JASMINUM NUDIFLORUM   | 24-30" ht.    | 36" O.C. |   | YES      | B2                         |
| .48      | RHUS AROMATICA 'GRO-LOW'  | 30" ht.       | 30" O.C. |   | NO       | B2                         |
| 30       | Fragrant Sumac<br>ROSA KNOCK-OUT 'RED'  | 30" + ht.     | 36" O.C. |   | YES      | B2                         |
| 81       | Red Knock-Out Rose<br>VACCINIUM CORYMBOSUM 'BOUNTIFUL BLUE'                       | 24-36" ht.    | 36" O.C. |   | NO       | B2                         |
| 20       | High Bush Blueberry<br>VACCINIUM CORYMBOSUM 'SUNSHINE BLUE'                       | 24-36" ht.    | 36" O.C. |   | YES      | B2                         |
| 65<br>PE | High Bush Blueberry<br>RENNIALS, ORNAMENTAL GRASSES, FERNS, VINES & GI            | 24-36" ht.    | 36" O.C. |   | YES      | B2                         |
| 20       | LAVANDULA ANGUSTIFOLIA<br>ENGLISH LAVENDER  | l gal.        | 18" O.C. |   | NO       | B2                         |
| 90       | PANICUM VIRGATUM 'NORTHWIND'<br>UPRIGHT SWITCHGRASS                               | l gal.        | 30" O.C. |   | YES      | BI                         |
| 56       | PANICUM VIRGATUM 'SQUAW'<br>SWITCHGRASS   | l gal.        | 30" O.C. |   | YES      | BI                         |
| 60       | PENNISETUM ALOPECUROIDES<br>FOUNTAIN GRASS  | l gal.        | 30" O.C. |   | NO       | BI                         |
| 10       | ROSMARINUS OFFICINALIS 'HERB COTTAGE'<br>ROSEMARY                                 | l gal.        | 18" O.C. |   | NO       | B2                         |
| 640      | SCHIZACHYRIUM SCOPARIUM 'THE BLUES'<br>THE BLUES LITTLE STEM                      | l gal.        | 8" O.C.  |   | YES      | BI                         |
| 35       | SOLIDAGO ODORA<br>SWEET GOLDENROD   | l gal.        | 8" O.C.  |   | YES      | BI                         |
| CR       | ROP PLANTS (TO BE PLANTED BY SCHOOL FOR PLOTS)                                    |               |          |   |          |                            |
|          | BROCCOLI  |               |          |   |          |                            |
|          | CABBAGE   |               |          |   |          |                            |
|          | CARROTS   |               |          |   |          |                            |
|          | CHARD   |               |          |   |          |                            |
|          | CORN  |               |          |   |          |                            |
|          | CUCUMBERS   |               |          |   |          |                            |
|          | EGGPLANT  |               |          |   |          |                            |
|          | FAVA BEANS  |               |          |   |          |                            |
|          | GARLIC  |               |          |   |          |                            |
|          | GREEN ONIONS/SCALLIONS  |               |          |   |          |                            |
|          | KALE  |               |          |   |          |                            |
|          | HERBS   |               |          |   |          |                            |
|          | LETTUCE   |               |          |   |          |                            |
|          | MELONS  |               |          |   |          |                            |
|          | PEAS  |               |          |   | <u> </u> |                            |
|          |   |               |          |   | <u> </u> |                            |
|          | RADISHES  |               |          |   |          |                            |

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CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS NO. DESCRIPTION DATE \_\_\_\_\_ \_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_ \_\_\_\_\_ \_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_ \_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_ \_\_\_\_\_

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**L708** 

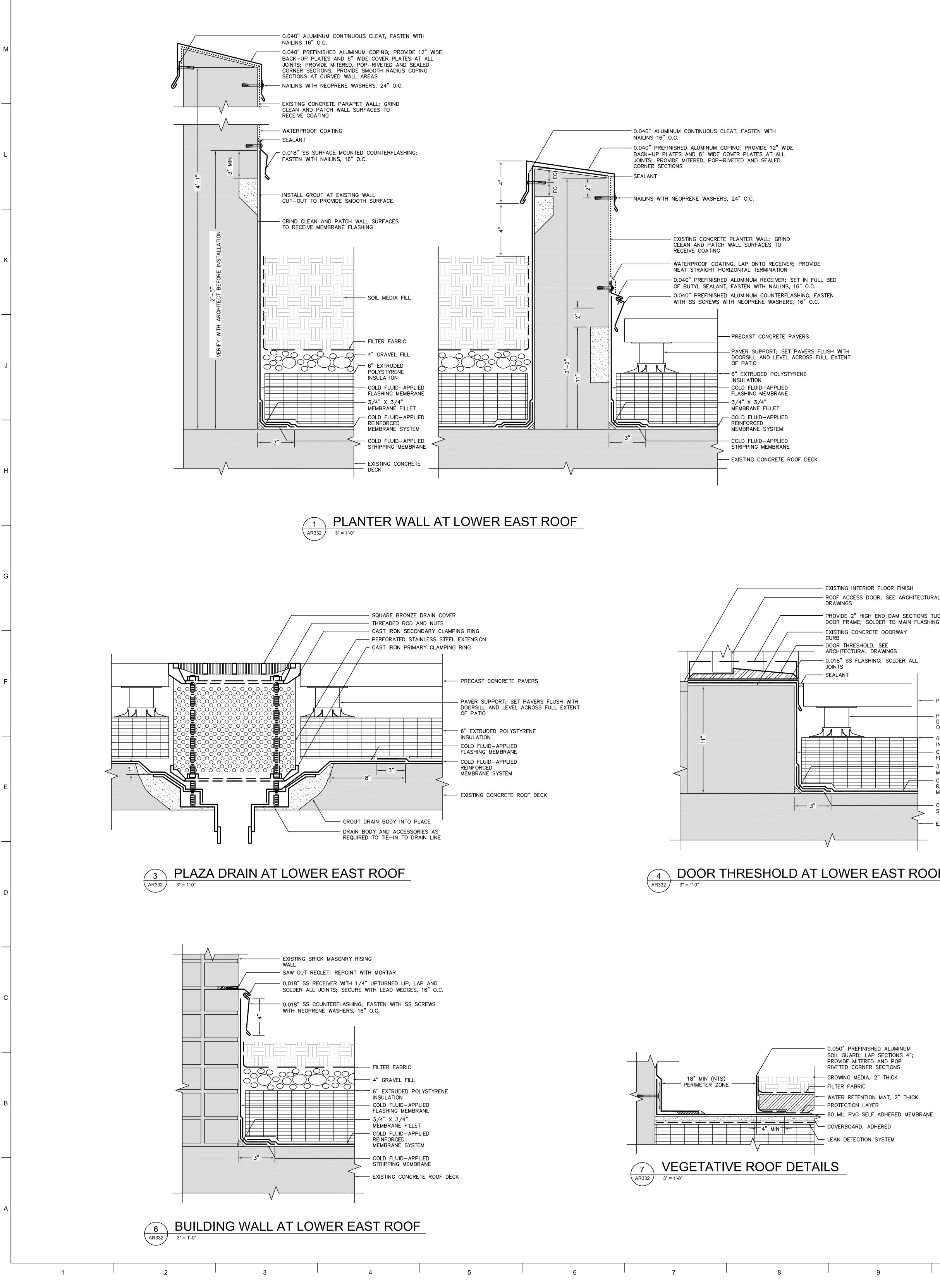
# SCHEDULE

KEY PLAN

PROFESSIONAL STAMP



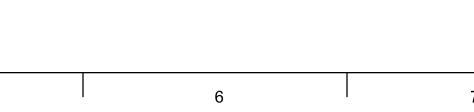
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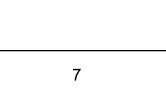


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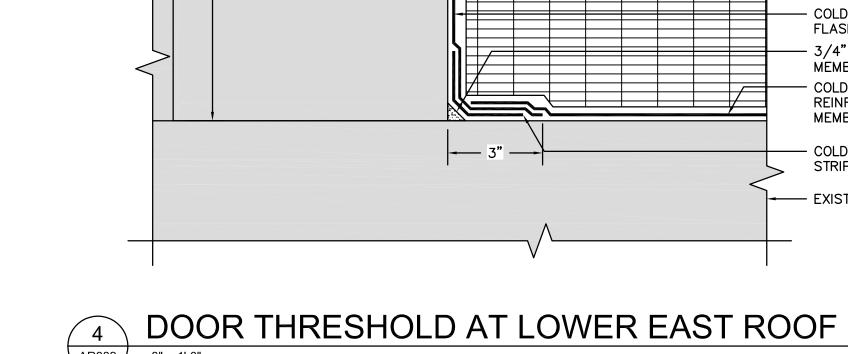






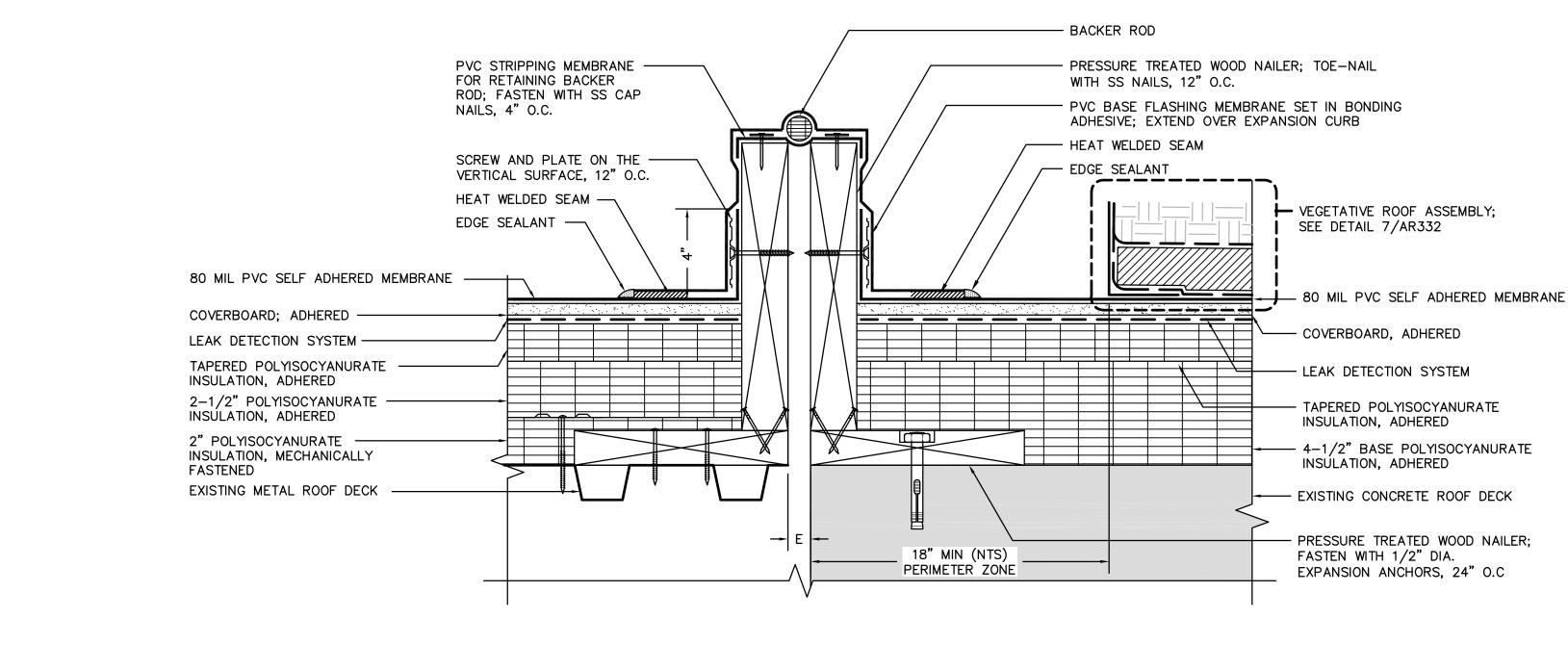
PROVIDE MITERED AND POP RIVETED CORNER SECTIONS - GROWING MEDIA, 2" THICK - WATER RETENTION MAT, 2" THICK - PROTECTION LAYER - 80 MIL PVC SELF ADHERED MEMBRANE COVERBOARD, ADHERED





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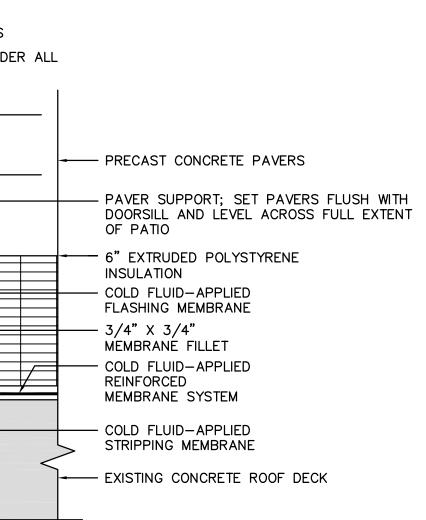
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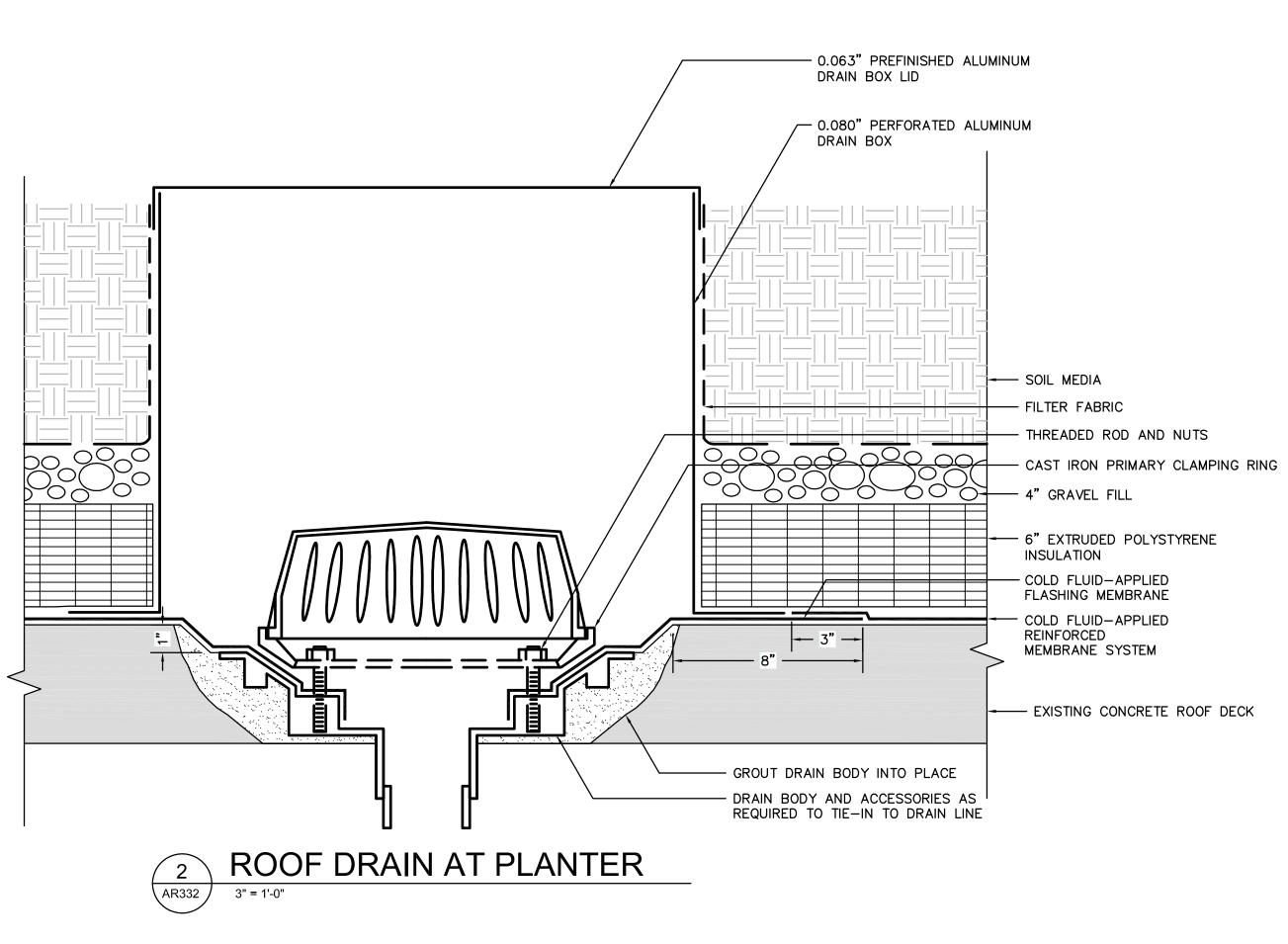
# 8 EXPANSION JOINT CURB AR332 3" = 1'-0"

|    |    | $\bigcirc$ |    |   |  |
|----|----|------------|----|---|--|
| 10 | 11 | 12         | 13 | , |  |

# - PROVIDE 2" HIGH END DAM SECTIONS TUCKED BEHIND DOOR FRAME; SOLDER TO MAIN FLASHING SECTION



# — SEALANT



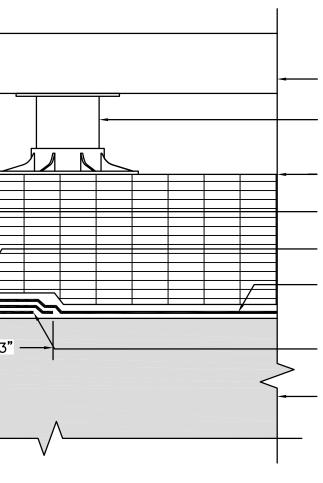
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# 5 BUILDING WALL AT LOWER EAST ROOF AR332 3" = 1'-0"



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PRECAST CONCRETE PAVERS - PAVER SUPPORT; SET PAVERS FLUSH WITH DOORSILL AND LEVEL ACROSS FULL EXTENT OF PATIO — 6" EXTRUDED POLYSTYRENE INSULATION - COLD FLUID-APPLIED FLASHING MEMBRANE — 3/4" X 3/4" MEMBRANE FILLET - COLD FLUID-APPLIED REINFORCED MEMBRANE SYSTEM - COLD FLUID-APPLIED STRIPPING MEMBRANE - EXISTING CONCRETE ROOF DECK

15

- 0.018" SS SURFACE MOUNTED COUNTERFLASHING; FASTEN WITH NAILINS, 16" O.C.

- SOIL MEDIA - FILTER FABRIC THREADED ROD AND NUTS COLD FLUID-APPLIED REINFORCED MEMBRANE SYSTEM 

KEY PLAN CONSTRUCTION DOCUMENTS 08/01/2016 REVISIONS DESCRIPTION NO. DAT **AR332** 

# MISCELLANEOUS DETAILS

PROFESSIONAL STAMP

DCRA STAMP ABOVE