MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

SHA Environmental Guide for District, Access, and Utility Permit Applicants

November, 2023

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

SHA Environmental Guide for District, Access, and Utility Permit Applicants

November, 2023

Chapter 1 - Overview

1.0 Purpose of Environmental Guide (EG)

The "Environmental Guide for District, Access, and Utility Permit Applicants", also known as the Environmental Guide (EG), is a supplement to the Maryland State Highway Access Manual and is provided for use by those who apply for permits issued by SHA District Offices.

The EG reflects current environmental policy, landscape design and construction standards of SHA, and provides guidance for District Permits, Access Permits, Utility Permits, and other SHA issued permits that involve construction and maintenance impacts in landscape areas of the roadside.

1.1 Permitted Restoration. Landscape construction in conformance with Category 700 of "SHA Standard Specifications for Construction and Materials" includes all work related to environmental restoration including all impacts, installation and maintenance activities involving soil or plants in areas of SHA property, right-of-ways, easement areas, and lands to be conveyed to SHA which collectively constitute SHA property. The permitted restoration of landscape areas of SHA property is the primary concern of the EG.

1.2 Use of Environmental Quality Assurance Checklist. A summary of environmental concerns is provided in EG Chapter 8. Applicants are encouraged to review the Environmental Quality Assurance Checklist to reduce the likelihood of errors and omissions in plan submittals.

1.3 Role of Office of Environmental Design (OED). The SHA District Office is responsible for determining permit requirements and issuing permits. The SHA Office of Environmental Design (OED) provides guidance such as the EG. OED also participates in the permit review process when requested by the District Office, and when a submittal may involve a specific OED review concern. Refer to EG Chapter 3 regarding OED review concerns.

1.4 Chapters of Environmental Guide (EG). The EG is divided into the following:

- **Chapter 1 - Overview** describes some key concerns, lists the chapters and topics of the EG, and describes the SHA Landscape Design Philosophy.

- **Chapter 2 - Guidance Documents** describes environmental and landscape design documents used by SHA and permit applicants.

- **Chapter 3 - Office of Environmental Design (OED)** explains the role of OED in the review of SHA permit submittals.

- **Chapter 4 - Permits and Mitigation** provides information about environmental permits and required mitigation for removing trees and other losses caused by construction activities under an SHA permit.

- **Chapter 5 - Special Landscape Concerns** briefly explains SHA requirements that affect landscape design and construction activities related to an SHA permit submittal.

- **Chapter 6 - Plans for Landscape Construction** explains requirements for the preparation of plans that impact or specify construction within landscaped areas of SHA property, and the elements that must be shown on those plans.

- **Chapter 7 - SHA Landscape Notes** explains the required conditions, and text that shall be reproduced on plans as SHA Landscape Notes.

- **Chapter 8 - Environmental Quality Assurance Checklist** helps to ensure that important concerns are addressed before plans are submitted. A similar checklist is used when OED provides comments for permit submittal reviews.

1.5 Topics of Environmental Guide (EG)

1.6 SHA Landscape Design Philosophy. Permitted landscape restoration must meet the same standards for design and materials used elsewhere in the highway system. Since landscaping is integral to highways and our environment, the plans, specifications and engineer's estimates submitted for a permit must provide durable roadside landscaping that thrives in difficult situations with little need for maintenance or replacement.

Permitted landscape restoration must be:

- **Context Sensitive**, to harmonize with the natural, cultural and built features it adjoins and passes through. Context sensitive designs fit the "sense of place" while ensuring the safety of highway users and maintenance staff.

- **Environmentally Appropriate**, to comply with legal requirements and meet stewardship goals of the SHA Business Plan. Environmentally appropriate designs limit impermeable surfaces, promote native species and naturalized elements, and include permits and approvals needed for construction.

- **Cost Effective**, to minimize funding requirements for installation and future maintenance. Cost effective designs fit within budget constraints while maximizing design impact.

- **Sustainable**, to implement design and management strategies. Sustainable designs use an asset -based approach that supports project goals and objectives, while promoting successful roadside vegetation establishment. The SHA Landscape Design Philosophy is a central focus of the SHA Office of Environmental Design, as expressed in the "SHA Landscape Design Guide" (LDG) and its related documents. It is part of our vision for roadside landscape design, and thus an important part of the permit review process.

Chapter 2 - Guidance Documents

2.0 Environmental Guidance Documents. The following documents are available for download and use by permit applicants.

2.1 "SHA Standard Specifications for Construction and Materials", also known as the Standard Specifications, defines construction materials and methods that are required for construction on areas SHA property. All construction under an SHA permit must conform to current Standard Specifications. Links to Standard Specifications and other landscape-related specifications are available at https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .

The Standard Specifications include requirements for soils, seed, fertilizer and plant materials as well as the standards for acceptance of permanent vegetation establishment. For ease of use, Sections of Standard Specifications are referred to by their Section number, e.g. Section 705. All of these standards apply to permitted landscape restoration. Unless other specifications are approved, all landscape materials and construction methods shall conform to Standard Specifications of Category 700 - Landscaping and Section 920 - Landscape Materials that are current at the time of construction.

To ensure use of approved materials and construction methods, plans developed for permitted restoration shall include certain SHA Landscape Notes that reference the Standard Specifications. These Notes are discussed in EG Chapter 7. To avoid future conflicts, and because the Standard Specifications are periodically revised and replaced, the text of Standard Specifications should not be reproduced on plan sheets prepared for permitted landscape restoration.

2.2 "SHA Landscape Design Guide" (LDG). This document explains the SHA landscape design philosophy and expectations for sustainable roadside landscaping. Topics of the LDG include:

- Info about the Maryland Roadside Tree Law, Chesapeake and Atlantic Coastal Bay Critical Area, and other environmental and landscape design topics.
- Offset distances to guardrails and to fixed objects such as trees, shrubs and other vegetation at various highway speeds.
- Offset distances to trees and shrubs to overhead and underground utilities.
- Guidelines for matching vegetation to soil placement, and for coordinating vegetation, soil stabilization matting and soil placement.
- Guidelines for reforestation design, and appropriate installation sizes of trees and other plant materials.
- Explanation about structure and contents of "SHA Preferred Plant List".

Go to: https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .

2.3 "SHA Landscape Construction Cost Estimating Manual" also known as the Estimating Manual. This document provides extensive design and cost guidance for landscape materials and operations required by the Standard Specifications, including subsoil, topsoil, temporary stabilization, turfgrass, meadow, types of soil stabilization matting, plant material installation, tree pruning, and related topics. The Estimating Manual and the table below are intended to guide development of the Engineer's Estimate (EE) for permitted restoration.

Go to: https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .

Cost of Trees, Shrubs, Perennials and Other Plant Materials

This table shows typical plant materials specified in plans for permitted restoration. Stock sizes correspond to ANSI Z60.1 Classifications. Cost includes purchase price, installation and establishment, and any necessary replacement until acceptance in conformance with SHA Specifications. Permitted restoration shall include plans with complete planting schedules for all plant materials, and the Engineer's Estimate shall itemize pertinent quantities and costs per each.

Stock Size	ANSI Z60.1 Classification	Cost
4.0 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 800
3.5 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 700
3.0 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 500
2.5 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 400
2 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 350
1.5 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 225
1 in. cal. deciduous tree	Types 1, 2, 3, 4 - tree-form	$ 175
8 ft. deciduous tree - multistem	Types 1, 2, 3, 4 – multistem or clump	$ 300
6 ft. deciduous tree - multistem	Types 1, 2, 3, 4 – multistem or clump	$ 200

8 ft. evergreen tree - conifer	Types 4, 5, and 6	$ 500
6 ft. evergreen tree - conifer	Types 4, 5, and 6	$ 300
5 ft. evergreen tree - broadleaf	Types 5 and 6	$ 400
Large shrub ≥ 36 in. ht.	Types 2, and 3	$ 60
Medium shrub ≥ 24 in ht.	Types 2, and 3	$ 45
Small shrub < 24 in. ht.	Types 1, 2, and 3	$ 30
Gallon Perennials	#1 Perennial - Gallon	$ 15
Quart Perennials	#SP4 Perennial - Quart	$ 10
Annuals and Bulbs	Annuals and Bulbs	$ 1

2.4 "SHA Book of Standards for Highway & Incidental Structures, Category 7, Landscaping", also known as Standard Details. Certain Standard Details are required for the installation of trees, shrubs and planting beds as specified in Section 710 of the Standard Specifications.

When applicable, the following Standard Details are required by the SHA Landscape Note of EG Chapter 7.4. However, the reproduction of Standard Details on plans for landscape restoration is recommended but not required.

MD-710.03-01 STAKING EVERGREEN TREES 5 AND 6 FEET HIGH

MD-710.03-02 STAKING EVERGREEN TREES 7, 8 AND 9 FEET HIGH

MD-710.03-03 GUYING EVERGREEN TREES 10 FEET HIGH AND GREATER

MD-710.03-04 STAKING FLOWERING TREES 6 FEET HIGH T0 2 INCH CALIPER

MD-710.03-05 GUYING FLOWERING TREES 3 INCH CALIPER AND GREATER

MD-710.03-06 STAKING SHADE TREES 6 FEET HIGH TO 2 INCH CALIPER

MD-710.03-07 STAKING SHADE TREES 2 INCH TO 3 INCH CALIPER

MD-710.03-08 GUYING SHADE TREES 4 INCH CALIPER AND GREATER

MD-710.03-09 FASTENERS FOR TREE SUPPORT

MD-710.03-10 PLANTING VINES ADJACENT TO WALLS FLAT AREAS AND SLOPES FLATTER THAN 4:1

MD-710.03-11 PLANT BED MULCHING AND PLANT LAYOUT ON FLAT AREAS AND SLOPES FLATTER THAN 4:1

MD-710.03-12 PLANT BED MULCHING AND PLANT LAYOUT ON SLOPES 4:1 AND STEEPER

MD-710.03-13 PRUNING PATTERNS

MD-710.03-14 PLANTING TREES ON SLOPES FROM 3:1 TO 2:1

MD-710.03-15 ROOT COLLAR HEIGHTS FOR VARYING SOIL CONDITIONS

Go to: http://apps.roads.maryland.gov/BusinessWithSHA/bizStdsSpecs/desManualStdPub/publicationsonline/ohd/bookstd/toccat7.asp

2.5 "SHA Preferred Plant List" (PPL). This document provides a list of acceptable species and cultivars of trees, shrubs and other plant materials for highway installation. Although other species and cultivars may be acceptable, permitted restoration should focus on species and cultivars included in the PPL. The structure of the PPL is described in Chapters 8.3 through 8.6 of the SHA Landscape Design Guide.

Go to: https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .

Chapter 3 - Office of Environmental Design

3.0 OED Review Concerns for Permit Projects. In concert with other SHA Offices, the SHA Office of Environmental Design (OED) participates in the review of permit submittals when permitted restoration will impact specific areas of OED concern. The following link opens the 'OED Environmental Assets Viewer' that is used to determine whether proposed construction will require OED review:

OED Environmental Assets Viewer Link https://arcg.is/18aW11

OED will review and comment on permit submittals when requested by the SHA District Office, or when a SHA permit project will impact any of the following four OED review concerns:

3.1 OED Managed Landscape Assets. Refer also to EG Chapter 4.4. These include three types of assets that are identified in the 'OED Environmental Assets Viewer'. Tree Groups, Plant Beds, and Turf Areas are maintained under contract by OED on right-of-ways, facilities, rest areas, gateways, monuments, and other SHA property.

When a permit project will impact any OED Managed Landscape Assets, review documents will be sent by the Utility Engineer to OED as soon as feasible after review concerns are identified. In response, OED will determine requirements for mitigation and restoration before issuance of the SHA permit. OED will request review of subsequent submittals and will provide design comments until permit issuance.

3.2 MS4 / TMDL Environmental Assets. Refer also to EG Chapter 4.5. To maintain compliance with its NPDES MS4 Permit and with TMDL regulations, SHA must maintain sufficient levels of impervious acre restoration credit as well as sufficient levels of edge-of-stream (EOS) and edge-of-tide (EOT) pollutant load reductions (collectively known as 'Credit') that are generated by stormwater management facilities (SWMFACs) and alternative Best Management Practices (BMPs) owned by SHA and referred to herein and collectively as 'MS4 / TMDL Environmental Assets'.

There are seven types of MS4 / TMDL Environmental Assets identified in the 'OED Environmental Assets Viewer':

Part 1 shows two types of assets, including Outfall Stabilization Assets and Stream Restoration Assets, and

Part 2 shows five types of assets, including Tree Planting Assets, Stormwater Control Structure Assets, Retrofit Assets, Pavement Removal Assets, and Drainage Area Assets. These assets are maintained and tracked by OED on SHA property and right-of-way.

When a permit project will impact any OED MS4 / TMDL Environmental Assets; including any impact, increase or decrease to an asset drainage area, review documents shall be sent by the SHA permit applicant to the SHA District Office for review by OED as soon as feasible after review concerns are identified. In response and before issuance of the SHA permit, OED will determine requirements for replacement of affected impervious acre restoration credit and TMDL pollutant load reductions and OED will approve any proposed 'replacement' BMP. OED will review subsequent submittals and will provide design comments to the District Office until permit issuance. Requirements for replacement of Credit is provided in EG Chapter 4.5.

3.3 Impacts to OED Mitigation Sites. Refer also to EG Chapter 4.6. These include Wetland Mitigation, Stream Mitigation, Critical Area Mitigation and Reforestation Sites. There are multiple types of mitigation sites on SHA property and right-of-ways.

When a SHA permit project will impact OED Mitigation Sites, review documents will be sent by the responsible SHA Engineer to OED as soon as feasible. OED will determine requirements for mitigation before issuance of the SHA permit. OED will request review of subsequent submittals and will provide design comments until permit issuance.

3.4 Trees, Brush, Shrubs, or Ornamental Plantings. Refer also to EG Chapter 4.7. When a permit project will remove or install trees, brush, shrubs, or ornamental plantings on SHA property and right-of-ways, OED will determine requirements for mitigation. As part of the review, OED will provide comments to ensure general conformance with standards of the Environmental Guide, and may provide detailed guidance to ensure adequate design before issuance of the SHA permit. OED may request review of subsequent submittals and may provide design comments until permit issuance.

3.5 Other Environmental Impacts. When a permit project will impact, remove or install turf, meadow or other environmental features on SHA property and right-of-ways, OED will provide comments when requested to ensure general conformance with standards of the Environmental Guide, and may provide detailed guidance to ensure adequate design. OED may request review of subsequent submittals and may provide design comments until permit issuance.

3.6 OED Divisions. The Divisions of OED have different responsibilities. When OED returns comments regarding a submittal for permitted restoration, the comments of all OED Divisions are included in the consolidated memo of comments returned to the SHA District Office for the initial submittal review any follow-up reviews.

The OED Landscape Programs Division (LPD) coordinates project reviews during design, and performs certain approvals and inspections in conformance with Standard Specifications during construction, and the OED Quality Assurance Division (QAD) performs other inspections during construction.

3.7 OED Project Review. As noted in EG Chapters 3.0 thru 3.4, OED reviews plans, specifications, engineer's estimates and other materials that are developed by applicants for permitted restoration when the permit project is known to involve OED review concerns. OED does not review plans, specifications or estimates for landscape restoration except as described in Chapters 3.0 thru 3.4.

3.8 OED Review Submittals. OED will review permit submittals that are sent directly from the SHA District Office to oedprojectreview@mdot.maryland.gov. OED is not authorized to receive or forward submittals sent directly from permit applicants.

3.9 OED Review Recommendations. When OED responds to a request from the District Office for review of a project submitted for a District, Access, or Utility Permit, a consolidated memo of OED comments is returned to the pertinent engineer of the SHA District Office.

In response to the comment letter sent from the District Office, the permit applicant shall use the EG to develop revised plans, specifications and engineer's estimates, and when developing the point by point response letter to OED review comments. Because OED staff do not correspond directly with permit applicants, no staff of OED are authorized to send comments directly to permit applicants. However, OED staff will provide guidance in conformance with the EG as noted in the comment letter from the District Office.

Chapter 4 - Permits and Required Mitigation

4.0 SHA Permits. Landscape restoration under a permit issued by a District Office of SHA shall conform to applicable laws, SHA Standard Specifications, and guidance of the Environmental Guide (EG). Mitigation required in conformance with the EG shall not be provided in easements on SHA property. Info about SHA permits is at https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=57 .

- **Access Permits.** Submittals for an Access Permit shall conform with EG Chapters 4.1 thru 4.4.

- **District and Utility Permits for Construction.** For individual Utility Construction Permits and Utility Relocation Permits, submittals for landscape construction shall be developed to the same standards as plans developed for an Access Permit per EG Chapters 4.1 thru 4.4 and EG Chapter 6.

- **District and Utility Permits for Maintenance.** For Utility Infrastructure Maintenance / Emergency Permits and Tree Trimming Permits, submittals for landscape maintenance shall sufficiently conform to requirements of the EG so that the scope of work will be adequately indicated in the permit issued by the pertinent District Office. Any plans developed for these permits shall conform with EG Chapters 4.1 thru 4.4, or as stipulated in the permit issued by the pertinent District Office for the permitted maintenance activities.

4.1 Roadside Tree Individual Permit (RTIP) / Maryland Forest Conservation Act.

4.1-a Permit Requirements. Tree removals, tree installation and impacts to tree branches or tree roots within SHA right-of-ways typically require a Roadside Tree Individual Permit (RTIP) issued by the Maryland Department of Natural Resources - Forest Service (MDNR-FS).

- **General.** A RTIP is required unless a RTIP is waived by MDNR-FS when an approved Forest Conservation Plan (FCP, in conformance with the Maryland Forest Conservation Act, FCA) includes work within SHA right-of-way.

- **Permit Coordination.** To avoid conflicts and any need for permit modifications, the applicant is advised to apply for the RTIP or other MDNR-FS issued permit after issue of SHA permit.

- **Landscape Plan.** To ensure compliance with Maryland law and provide adequate mitigation for impacts to SHA property, the landscape plan developed per ED Chapter 6 for the SHA permit shall indicate all tree, shrub and brush removal in SHA property.

- **Required Mitigation.** The landscape plan shall indicate the species, sizes, locations and conditions of trees to be removed in SHA right-of-ways, and shall indicate the species, size and location of trees to be installed as mitigation, except when mitigation is waived by SHA as described in EG Chapter 4.1-e.

- **Required Protection Measures.** The landscape plan shall clarify the nature of any impacts to existing plants in SHA right-of-ways, property, easements or lands to be conveyed to SHA by delineating and noting the locations of any necessary Tree Root Pruning, Tree Branch Pruning and Tree Fertilizing.

- **Permits Issued Before Construction.** The applicant for the SHA permit is responsible for coordination required to obtain any required RTIP or FCA approvals before beginning construction under the SHA permit.

4.1-b SHA Mitigation Requirements. In conformance with the Maryland Roadside Tree Law for areas within SHA right-of-ways, the applicant is required by MDNR-FS to mitigate the removal of trees with trunk diameter of 2 inch diameter at breast height (2 in. DBH) or greater. However, as the owner of the right-of-ways or other property or easements:

- SHA typically requires mitigation as a condition of the SHA permit to compensate for the loss of trees and any ornamental plantings, shrubs, or brush (i.e., any undifferentiated mix of tree and shrub species generally less than 6 in. DBH).
- SHA typically requires mitigation for trees, large shrubs and brush to provide no net loss of canopy at maturity as described in EG Chapter 4.1-c.
- SHA requires mitigation plantings to be installed on SHA right-of-ways, property, easements or lands to be conveyed to SHA, unless other locations are approved per EG Chapter 4.1-d.
- SHA requires mitigation trees and large shrubs to be selected from the SHA Preferred Plant List and installed in conformance with Section 710.
- SHA may require other landscaping or extended maintenance to restore natural areas, or may require additional mitigation for significant or specimen trees.

4.1-c Canopy Mitigation by Area. Regardless of the actual number of trees or large shrubs within a proposed impact area, or within an area of brush, the required mitigation shall be calculated based upon the area of canopy impact.

When mitigating by area, trees are specified for installation in conformance with tree sizes and stocking densities of Table 4.1-c to meet the contextual needs of the location (i.e., streetscapes, general landscape areas, or large reforestation areas), and large shrubs are specified in lieu of trees where shrubs are appropriate on a case-by case basis. Depending upon the proposed locations, one or more stocking sizes and densities may be necessary to provide the total required mitigation.

Table 4.1-c Mitigation Tree Size and Stocking Density for Typical SHA Permit Plantings

Tree Type & Size		Rootstock	Minimum Tree Stems per Acre	Approximate Spacing Feet on Center	Canopy Square Feet Equivalent
Deciduous	Evergreen				
LOCATION: STREETSCAPES					
2 in. cal.	7 ft ht.	B&B or CG	110	20	400
LOCATION: GENERAL LANDSCAPE AREAS					
1.5 in. cal.	5 ft ht.	B&B or CG	150	17	290
LOCATION: LARGE REFORESTATION AREAS See LDG 4.6. Some larger trees may also be required					
1 in. cal.	4 ft ht.	B&B or CG	200	15	220

4.1-d Offsite Mitigation Options. The following options may be pursued when mitigation planting locations on SHA right-of-ways or property cannot be identified for compliance in conformance with EG Chapter 4.1-b.

1. **Forest Mitigation Banking.** An acceptable alternative method for mitigating tree removals where there is insufficient space to install trees in nearby areas of SHA property involves mitigation provided by the applicant in an approved forest mitigation bank site.

2. **Easement.** The creation of a perpetual easement on private property may be accepted by SHA as the location of tree mitigation plantings.

3. **Other Public Property.** SHA may accept mitigation plantings on other public property such as non-SHA right-of-ways, park lands and similar locations.

4.1-e Table of Tree, Shrub and Vegetation Removals. When plans involve removal of trees, large shrubs, or other ornamental landscape plants, a Table of Tree, Shrub and Vegetation Removals shall be inserted into the landscape plan which indicates the species, sizes, locations and conditions of individual trees of 6 in. DBH or greater, with characterization of shrubs or other vegetation to be removed.

1. If the Table shows trees to be removed as well as trees to remain, any trees to be removed without mitigation due to insufficient planting space, or conflicts with utilities, or other reasons related to highway safety or operability, shall be identified in the table as follows:

SHA Mitigation Waived for This Tree

2. For areas of undifferentiated brush or small mixed trees that are not feasible to report, the total area of removal may be reported in square feet in the Table.

3. When SHA requires no mitigation for removal of an area of undifferentiated brush or small mixed trees, the following note shall be reproduced on the plans with leader to the pertinent area.

SHA Mitigation Waived for All Trees. *No mitigation is required by SHA for removal of trees and brush in this area.*

SHA will review the Roadside Tree Permit and proposed mitigation as part of the permit review process. Conformance with the Roadside Tree Individual Permit shall be a condition of the SHA permit application, and the approved permit or plan notes shall indicate the applicable requirements.

4.2 Wetlands and Waterways Permit and Mitigation. Refer to EG Chapter 3.0.

The applicant for a SHA permit is responsible for obtaining all permits and approvals necessary from state and federal regulatory agencies related to wetlands and waterways. Any resulting required mitigation is the responsibility of the permit applicant and shall not be constructed on SHA property or right-of-ways. Fines, additional permitting expenses or mitigation resulting from unauthorized impacts to wetlands and waterways shall be the responsibility of the SHA permit holder.

As described in EG Chapter 3, OED will review the submitted plans as part of the permit review process. To reduce conflicts, OED should review submittals before the issuance of any wetlands and waterways permits by state or federal agencies. Conformance with any approved Wetlands and Waterways Permit shall be a condition of the SHA permit, and the approved permit or plan notes shall indicate the applicable requirements.

4.3 Critical Areas & Mitigation. The applicant for a SHA permit is responsible for obtaining all necessary approvals from the Chesapeake and Atlantic Coastal Bays Critical Areas ('Critical Area') and may require mitigation. Required mitigation is the responsibility of the permit applicant and shall not be constructed on SHA property or right-of-ways. Note: Guidance of LDG Chapter 4.10 is not generally applicable to SHA permit projects.

4.4 OED Managed Landscape Assets. Refer to EG Chapter 3.0 and 3.1. Because these assets are typically located on SHA right-of-ways, the function of these assets may be damaged by construction activities under a SHA permit. Applicants for SHA permits shall clearly show no impacts to OED Managed Landscape Assets, or shall mitigate impacts as part of a permitted project. SHA permit applicants shall develop plans to document existing conditions, as well as any plans that are determined to be necessary to restore or reconstruct OED Managed Landscape Assets that will be impacted by construction.

4.5 MS4 / TMDL Environmental Assets. Refer to EG Chapter 3.0 and 3.2. MS4 / TMDL Environmental Assets are typically located on SHA right-of-way and the function of these assets may be affected by construction activities which can result in Credit losses. If there are no impacts to MS4 / TMDL Environmental Assets associated with the permit project, the applicant for the SHA permit shall clearly show no impacts in the submittal documents.

4.5-a MS 4 / TMDL Overview. When a permit project will impact any existing SHA MS4 / TMDL Environmental Assets, the applicant shall offset all associated Credit lost, in full, with equivalent Credit from any new BMP implemented by the applicant in the same 8-digit watershed where the impacts occurred and as a component of their project through design, construction, and transfer of new, replacement BMP. Replacement of Credit shall be provided in-kind for all types of SHA Credit losses and exclusively with any replacement BMP (see EG 4.5-b Submittal Requirements for acceptable BMP types) approved by OED.

Following construction of a replacement BMP, all 'Credit Holder' and proprietary rights for the replacement BMP shall be transferred to SHA through an appropriate legal mechanism at the cost of the applicant. If MS4 / TMDL Environmental Assets impacted by a permit project are identified as loss of water quality on that impacting project's Water Quality Summary Sheet, or accounted otherwise as a water quality loss, for purposes of the permit project complying with stormwater management regulations or permitting, SHA's impervious acre restoration credit and TMDL pollutant load reductions generated by those MS4 / TMDL Environmental Assets shall be replaced separately for SHA's MS4/TMDL compliance and in addition to any treatment that may be required to mitigate water quality losses per stormwater regulations.

Questions regarding existing SHA MS4 / TMDL Environmental Assets claimed for NPDES MS4 permit or TMDL compliance and replacement strategies should be directed to OED. When any requirements described in this section are identified for a project applying for SHA permits, OED will require that SHA permit documents be revised to reflect SHA requirements.

4.5-b MS 4 / TMDL Submittal Requirements. Applicants for SHA permits shall incorporate into their project design plans the location of any existing MS4 / TMDL Environmental Assets, the proposed impacts thereto, and the location and design plans for any new BMP that is proposed to replace impacted impervious acre restoration credit and TMDL pollutant load reductions.

The permit applicant shall also develop a proposal to SHA, at the applicant's cost, with all pertinent information regarding replacement of any BMP that may be necessary to replace SHA's impervious acre restoration credit and/or TMDL pollutant load reduction losses resultant from the permit project impacting MS4 / TMDL Environmental Assets, including but not limited to computations and summaries for amounts of impervious acre restoration credit and TMDL pollutant load reductions the replacement BMP will generate, and incorporate the proposal into the project design documents subject to review by OED.

Any replacement BMP shall be in the form of new stream restoration, riparian forest planting and/or riparian conservation landscaping built in conjunction with stream restoration, impervious surface reduction, and/or urban soil restoration implemented in accordance with the current/applicable version of the MDE document, "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" and any applicable guidance approved by the Chesapeake Bay Program and Maryland Department of the Environment.

The type and quantity of replacement BMP proposed by the applicant, as well as the amount and viability of impervious acre restoration credit and TMDL pollutant load reductions generated by each, will require approval of OED before issuance of the SHA permit which impacts existing MS4 / TMDL Environmental Assets.

4.5-c MS4 / TMDL Construction Requirements. Any required construction of replacement BMP shall be implemented before, or concurrent with, the impacts to the existing MS4 / TMDL Assets. The SHA permit applicant shall secure all permits, environmental clearances, and property rights / right-of-way / easement acquisitions necessary for construction of replacement BMPs, and shall secure perpetual access for SHA agents to perform inspections and maintenance activities.

If a proposed replacement BMP will not be constructed on SHA property, the SHA permit applicant shall establish and secure a perpetual conservation easement, or similar instrument, in SHA's name for the project area of the replacement BMP. Construction of any replacement BMP on public land, and agreements with public landowners to fulfill the function of perpetual conservation easements, may be considered by OED on a case-by-case basis. Terms of such agreements will require concurrence of OED.

The SHA permit applicant is responsible, at their cost, for all site monitoring required before, during, and after construction until SHA has accepted a replacement BMP for maintenance.

4.5-d Inspection, Maintenance and Adaptive Management. The SHA permit applicant shall perform preventative maintenance inspections as well as routine maintenance or remediation work necessary to ensure that a replacement BMP remains viable for the MS4 / TMDL credit until ownership and associated rights for the BMP is transferred in full to SHA, and SHA accepts the BMP for maintenance.

Any proposed design changes or adaptive management actions shall be presented to SHA for review and comment before implementation. Upon regulatory closeout for a replacement BMP, or upon acceptance by SHA, the SHA permit applicant shall transfer to SHA full ownership of the constructed BMP(s) including all associated easements and/or agreements, and 'Credit Holder' rights for replacement Credit, and shall provide to SHA as-built plans of the constructed replacement BMP including calculations of impervious acre restoration credit and TMDL pollutant load reductions generated by the BMP.

All requirements to establish SHA as the Credit Holder for replacement Credit shall be performed by the SHA permit applicant at no cost to SHA.

4.5-e Credit Rights for BMPs Owned by Permit Applicants. For any treatment of SHA-owned impervious surfaces by the permit project, SHA will require that rights to claim impervious acre restoration credits or TMDL pollutant load reductions generated from that treatment be transferred to SHA by the applicant for a SHA permit. The SHA permit applicant shall indicate any SHA-owned impervious surfaces that are proposed to be treated as part of a permitted project.

Note: SHA reserves the right to take any impervious acre treatment credit that exceeds the applicant's new development or redevelopment treatment credit requirements when qualifying MS4 / TMDL Environmental Assets are constructed on SHA property.

4.6 OED Mitigation Sites. Refer to EG Chapter 3.0 and 3.3. Applicants for SHA permits with potential impacts to OED Mitigation Sites shall avoid, minimize or mitigate impacts to the OED Mitigation Site in coordination with the approval regulatory agencies and at the expense of the permit applicant. Required mitigation is the responsibility of the permit applicant and shall not be constructed on SHA property or right-of-ways. Additional agreements with SHA may be required to ensure the required mitigation is complete

4.7 Ornamental Plants, Shrubs, Brush or Trees. Refer to EG Chapter 3.0 and 3.4. Impacts to these assets may require specific mitigation and restoration. Applicants for SHA permits shall clearly show no impacts, or shall mitigate impacts as part of a permitted project. SHA permit applicants shall develop plans to document existing conditions, as well as any plans that are determined to be necessary to restore or reconstruct areas of ornamental plants, shrubs brush or trees that will be impacted by construction.

Chapter 5 - Special Landscape Concerns

5.0 Special Landscape Concerns. Many key landscape concerns are summarized in EG Chapters 5.1 through 5.12, below. For more information about these issues and other topics of concerns, refer to the LDG and other SHA Landscape Guidance Documents described EG Chapters 2.0 through 2.8.

5.1 Environmental Area Protection. Plans developed for a permit are expected to provide all reasonable measures to protect environmental resources. The following measures may be required to protect environmental resources as part of permit requirements for construction: Directional Boring, Temporary Orange Construction Fence, Tree Planking, Timber Mats, Compost Logs, other practices to reduce impacts or damage to trees and environmental areas.

Specific measures to protect environmental resources shall be indicated in permits and plans, and the use of such measures shall be required as a condition of the approved permit. Refer to EG Chapter 5.2, below. Any changes to approved plans will require review and concurrence of applicable permitting authorities.

5.2 Tree Preservation and Pruning Standards. Trees and areas of shrubs shall be preserved and protected to the extent feasible. Plans developed for an SHA permit are expected to limit unnecessary removals and undesirable impacts to trees and shrubs to remain within SHA right-of-ways, or within SHA easement areas, or on existing SHA property, or within property to be conveyed to SHA as a condition of permit issuance.

Refer to the Chapters 712 through 716 of the SHA Estimating Manual for more information about Tree Felling, Brush Removal, Tree Branch Pruning, Tree Root Pruning and Tree Fertilizing in conformance with the Standard Specifications. The creation of Tree Preservation in conformance with Section 120 of the Standard Specifications, and adherence to pruning standards are required as conditions of the SHA permit. Any changes to approved permits or plans will require review by the SHA Office of Environmental Design and applicable permitting authorities.

- **Tree Preservation.** Section 120 provides standards and defines certain prohibited and restricted activities within Tree Protection Areas surrounded by Temporary Orange Construction Fence (TOCF). Designated Tree Preservation Areas, including natural areas adjacent to approved permit construction sites, must be protected with TOCF conformance with Section 120.

- **Required Operations.** When construction may damage sensitive trees or other landscaping, the plans shall delineate Tree Preservation Areas and TOCF at the dripline of the trees or along the edge of areas to be preserved. To preserve the health of existing trees and other vegetation to remain, the plans shall delineate Tree Root Pruning, Tree Fertilizing, Tree Branch Pruning and any necessary Brush Removal which may be appropriate for individual trees or groups of trees at the edge of Tree Preservation Areas or within their limits.

- **Pruning Standards.** Sections 712 through 716 of the Standard Specifications provide requirements for activities that impact trees and shrubs. Pruning on SHA property shall conform to plans developed for approved permits and to the Standard Specifications which reference “ANSI A-300 Standards for Tree Care Operations” as the standard methods. The goals and limits of pruning shall be clearly specified in the SHA Landscape Notes or indicated on the plans.

5.3 Tree and Brush Clearance for Aesthetic Enhancement or Visibility.

Requests from nearby residential or commercial property owners for permission to prune or remove trees on SHA property often involves an interest to improve the appearance of the area or improve the visibility of commercial signs, buildings, etc.

However, in accordance with the Maryland Roadside Tree Law, SHA must protect trees growing in the right-of-way from unnecessary impacts and removals. Refer to EG Chapter 4.

Any request to remove trees for aesthetic enhancement or to improve visibility will require the applicant to perform a site review and to prepare landscape plans which describe all site impacts and mitigation for removal of trees, etc. When landscaping may require a higher level of future maintenance, refer to EG Chapter 5.11.

Conformance with the landscape plan shall be required as a condition of the permit application, and the permit documents or plan notes shall indicate the applicable requirements. Any changes to approved permits or plans will require concurrence of the Office of Environmental Design and applicable permitting authorities.

5.4 Offset Distance to Roads and Utilities. The LDG provides guidance regarding safe and sustainable landscape design. The minimum offset distances from trees to overhead and underground utilities, and the minimum offset distances from trees to roadways, guardrails and structures are provided in the LDG. Unless other offset distances are clearly indicated on the plans and approved by the Administration, the offset distances of the LDG shall be used to ensure adequate offset distances to trees and other fixed objects within the highway clear zone.

5.5 Demolition, Clearing and Grubbing, Excavation and Restoration. Construction activities that disturb soil, plant materials, pavements or structures are generally expected to minimize impacts caused by construction.

Excavation and construction within the limit of disturbance (LOD) must conform with Section 101 - Clearing and Grubbing of the Standard Specifications so that stumps and other debris that may adversely impact the installation, future stability or maintenance of pavements, sidewalks, hardscape, turfgrass, plant materials, etc. are removed as part of plans developed for an SHA permit.

Since the expectation of SHA is that all areas within the LOD are subject to demolition and removal, the plans developed for a permit shall indicate any areas, trees or other materials within the LOD that will not be removed. Therefore:

- Plans shall specify the installation locations of Temporary Orange Construction Fence per Section 120, or propose other methods, and insert any notes that may be required to clearly indicate the areas or objects to be preserved, and the methods for their protection.

- Plans shall delineate and note measures to protect sensitive areas, trees, pavements, structures, etc. within or adjacent to the LOD that must be protected from construction impacts.

- Plans shall restore soils of landscaped areas to promote sustainable growth of vegetation, to mitigate the loss of trees and other vegetation, to restore pavements and structures, and to conform with design requirements of SHA and all legal requirements.

5.6 Landscape Restoration with Subsoil and Topsoil. The requirements for landscape restoration and soil placement are site specific.

Soil Materials. Unless salvaged subsoil and/or salvaged topsoil are tested and approved in conformance with procedures of SHA Office of Materials Technology, the use of furnished subsoil and furnished topsoil shall be used for landscape restoration in conformance with SHA Landscape Note 7.8.

Minor Restoration. Incidental ruts and other minor damage caused to areas of SHA property shall be repaired with approved topsoil and Turfgrass Establishment in conformance with the pertinent SHA Landscape Notes unless other materials are specified.

Major Restoration. Refer to EG Chapter 5.6; and to Chapter 701 of the Landscape Estimating Manual. Excess excavated materials, debris, drilling mud and other unsuitable materials shall be removed from work areas.

One or more of the following types of restoration areas may be present within the limits of disturbance, and each shall be restored with soil placement in preparation for permanent landscaping as described.

- **Clearing and Grubbing.** Areas of Clearing and Grubbing shall be restored by Placing Furnished Topsoil 4 in. Depth in conformance with Section 701. Any areas of deep excavation may require the placement of a layer of approved subsoil as well as placement of 4 in. topsoil to ensure sustainable plant growth. However, for most areas of general site preparation and Clearing and Grubbing, subsoil placement is not necessary.

  Refer to EG Chapter 5.6. Areas of Clearing and Grubbing shall be restored as described in the SHA Landscape Note per EG Chapter 7.7 and 7.8. Unless other areas are delineated and other specifications are approved, all areas within the Limits of Disturbance shall be restored as areas of Clearing and Grubbing.

- **Sidewalk and Driveway Pavement Removal.** Existing areas of sidewalks and driveways without subbase aggregate or heavily compacted subgrade may be excavated to allow restoration with Placing Furnished Topsoil 6 in. Depth.

  Areas of sidewalk and driveway removal shall be restored as described in the SHA Landscape Note per EG Chapter 7.7 and 7.8. Such areas shall be delineated on the plans with a callout note to identify the area of sidewalk or driveway removal with the required depth of topsoil.

- **Roadway Pavement Removal.** Existing areas of roadway pavement to be converted to permanent landscaping shall be excavated to remove pavements, subbase aggregate and heavily compacted borrow materials to allow Placing Furnished Subsoil 12 in. Depth and Placing Furnished Topsoil 4 in. Depth.

  Areas of roadway pavement removal shall be restored as described in the SHA Landscape Note per EG Chapter 7.6, 7.7 and 7.8. Such areas shall be delineated on the plans with a callout note to identify the area of roadway pavement removal with the required depth of subsoil and topsoil.

5.7 Restoration of Turfgrass.

Refer to Chapters 705, 708 and 709 of the Estimating Manual for information about turfgrass and different types of soil stabilization matting. The plans shall delineate the areas of Turfgrass Sod from the areas of Turfgrass Establishment (seeding) and other areas of permanent groundcover, and shall delineate areas of different types of soil stabilization matting as appropriate.

- **Turfgrass Sod Establishment** is preferred in urban areas, in 'tree lawns' between curbs and sidewalks, within 3 feet of sidewalks and paths, adjacent to driveways, and in other areas such as curbed medians, grass-lined swales, and channels where more rapid turfgrass establishment is desirable. Turfgrass sod shall be installed in conformance with Section 708.

- **Turfgrass Establishment** (seeding) is appropriate for installation within 10 feet of the pavement edge of most roadside areas, and is appropriate in all areas where turfgrass is generally adapted. Turfgrass Establishment shall be specified as permanent groundcover for soil stabilization except where sod or other permanent vegetation is preferable, as described in the Estimating Manual. Turfgrass shall be installed in conformance with Section 705, either with or without soil stabilization matting per Section 709.

5.8 Restoration of Meadow and Naturalized Areas. Meadows on roadsides, in stormwater management facilities, and in other naturalized areas shall be restored in conformance with Section 707, 706, or other specifications. The reproduction of Special Provisions such as Airport Bioretention Meadow Establishment, etc. may be required in plan sheets. Meadow vegetation on SHA property is mowed by SHA once per year or less. Installing meadow vegetation in areas more than 10 feet from the pavement edge is generally preferred where its installation is consistent with safe highway operation and the context of adjacent landscaping.

Shrub seeding is installed in areas that are not mowed. The installation of shrub seeding in naturalized areas more than 10 feet from the pavement edge is generally preferred where shrubs are consistent with safe highway operation and context of adjacent areas. The permit or plans shall indicate the specific requirements and areas to be seeded with Meadow Establishment or Shrub Seeding Establishment.

5.9 Restoration of Trees, Shrubs and Landscape Beds. Trees, shrubs and landscape beds shall be restored as required by SHA in conformance with EG Chapter 4 and Sections 710 and 711 of the Standard Specifications. The permit or plans shall indicate the plant materials, installation sizes and other restoration requirements in conformance with EG Chapter 6.

5.10 Installing and Restoring Structures, Hardscape, etc. Retaining walls, pavers, steps, railings, trash receptacles, bike racks and other street furniture shall be removed and reset or reconstructed to the same grades and locations, or as approved by SHA. The composition, formliner, surface finish, color and other pertinent specifications for materials to be installed shall be clearly specified. During construction, samples may be required for approval before installation.

5.11 Future Maintenance. SHA is committed to providing a safe, attractive roadside environment. However, to limit the costs of future maintenance provided by SHA, and to allow adjoining property owners the ability to provide a higher level of maintenance, SHA also provides mechanisms for those who wish to provide additional maintenance for landscaped areas of the roadway.

Except for areas planted by SHA at gateways, monuments and similar sites, the only routine maintenance that SHA provides is mowing. Areas within 10 feet of the pavement edge are typically mowed several times per year, and areas more than 10 feet are mowed once per year in the dormant season. SHA will only provide mowing maintenance for turf areas installed by others.

Planting beds and other ornamental plantings may be installed by adjoining property owners and others willing to provide the necessary maintenance as part of a right of entry agreement under a District Permit issued by a SHA District Office. Refer to EG Chapter 7.23 regarding the Future Maintenance Landscape Note.

Landscape plans submitted for an SHA permit that involve the construction of planting beds or the installation of plant materials that will require additional maintenance to remain safe and attractive, but which seem unlikely to receive adequate future maintenance by the applicant, may be restricted to species and designs that are sustainable by SHA without additional maintenance.

5.12 District and Utility Maintenance Permits. These permits include Tree Trimming Permits and Utility Infrastructure Maintenance / Emergency Permits (Blanket Permits). These permits are issued by the SHA District Office, and do not require submittal of landscape plans with SHA Landscape Notes. However, all work must be performed in conformance with Maryland law, and mitigation may be required for any tree removals.

The SHA permit submittal shall include clear guidance regarding operations and mitigation. If possible, the SHA permit should be approved before any permit issued by the Maryland Dept. of Natural Resources - Forest Service (MDNR-FS) to ensure that trees on SHA property will be adequately protected and mitigated. Prior issuance of the SHA permit will help to ensure coordination of SHA and MDNR-FS mitigation requirements without the need for permit addenda or resubmittals.

Chapter 6 - Plans for Landscape Construction

6.0 Requirements for Plans with Landscape Construction. Although SHA permitted projects with maintenance impacts do not require landscape plans, all projects that involve demolition and landscape restoration within landscaped areas of SHA property require plans developed in conformance with EG Chapter 6.

The pertinent SHA District Office will review construction plans, landscape plans, roadway plans, E&S plans, stormwater management plans and other relevant plans as part of the permit review process, and OED will participate as described in EG Chapters 3.0 thru 3.4.

The following concerns must be addressed when developing plans that involve landscape impacts, landscape construction or the installation of landscape materials on SHA property. Permit applicants are encouraged to use the Checklist of EG Chapter 8 to reduce errors and conflicts in project submittals.

a. **SHA Specifications.** All projects shall be designed so that they may be constructed in conformance with the Standard Specifications unless other specifications are approved.

b. **SHA Landscape Guidance.** All projects that involve impacts to soil or vegetation on SHA property shall be designed in conformance with SHA Landscape Guidance Documents, and all sheets of submitted plans with such impacts shall be coordinated to ensure no conflicts with plans for landscape construction.

c. **SHA Terminology.** All plan sheets, including roadway plans, erosion and sediment control (E&S) plans, stormwater management plans (SWM), and any other plans that describe work to be performed using Cat. 700 - Landscape Construction or Section 920 -Landscape Materials shall use SHA-approved terms for the pertinent landscape materials and construction.

d. **Plans with Landscaping.** All plan sheets shall be cross-referenced with callouts or other notes, so that landscape materials and construction specified in E&S plans or other sheets use approved terms and are linked to the pertinent SHA Landscape Notes.

e. **Non-SHA Standards.** No plan sheets shall reproduce specifications, details, typicals or standards of counties, municipalities, or the Maryland Department of the Environment, or other agencies which do not conform with Standard Specifications except as follows:

    1. **Not for Construction on SHA Property.** Non-SHA standards, etc. may be included on SHA Permit plans when it is reasonably clear that such standards are not intended for construction on SHA property,

    2. **SHA Not Approved Standards.** Standards, etc. that are not approved for construction on SHA property may be included on SHA Permit plans when the following note is prominently inserted onto each sheet where the no SHA approved alternative standards are reproduced:

> ***SHA Not Approved Standards.*** *Refer to the Table of SHA Landscape Notes in this plan set for requirements related to soil, seed, plants, fertilizer, other landscape materials, and construction under this Permit. SHA Standard Specifications for Construction and Materials and other SHA Standards shall supersede all others for landscape construction on property of Maryland State Highway Administration (SHA).*

3. **SHA Approved Alternative Standard.** Non-SHA alternative standards, etc. that are approved for construction on SHA property may be included on SHA Permit plans when approval is granted during the permit review process. Each approved alternative standard is shall be identified on the plans with callout to the following note:

> ***SHA Approved Alternative Standard.*** *The specification, detail, typical or standard identified by this note has been accepted for construction under this Permit on property of Maryland State Highway Administration (SHA).*

6.1 Professional Seal on Plans for Landscape Construction. Plans for landscape construction, or formal landscape plans, may be sealed by different qualified professional staff depending upon the anticipated impacts and reconstruction:

- **Landscape Architect.** Plans that involve removing or installing trees, shrubs, decorative landscaping or structures on SHA property shall be sealed by a Registered Landscape Architect or Professional Landscape Architect licensed in the State of Maryland.

- **Professional Engineer or Surveyor.** Plans may be developed by a Professional Engineer or Surveyor licensed in the State of Maryland when impacts only involve soil disturbance or installing turfgrass with or without soil stabilization matting for permanent vegetation groundcover.

6.2 Landscape Construction Plan Elements. All plans that involve landscape construction per Cat. 700 - Landscaping or Section 920 - Landscape Materials of the Standard Specifications, shall conform to requirements of the District Office. Such plans shall also generally conform to the standards of the LDG, which are summarized in EG Chapter 6.2-a through 6.2-g, below.

Note: Supplemental plans may be required to adequately show existing conditions, proposed demolition and details of specialized construction.

6.2-a Landscape Construction Plan Labels and Legends. All plan sheets which specify landscape construction or materials within SHA property shall clearly show:

- **Required Elements.** Plan scale with graphic scale detail, direction of north, Maryland route number, road names with posted speeds of all roads within the project limits, legend for graphics used on the sheet, and any other information such as topography and grading lines that may affect evaluation of the plans.

- **Pavement Marking.** When the plan set involves changes to roadway pavements or markings, the landscape plan shall also include the proposed modifications.

- **Other Plans.** When the plan set includes erosion and sediment control plans, stormwater management plans, or other sheets that require Category 700 - Landscape Materials or Construction, all sheets shall reproduce or clearly reference the pertinent work and any pertinent SHA Landscape Notes.

6.2-b Right-of-Way Line, SHA Property Lines, Signs and Structures. All plans shall clearly show the existing and any proposed right-of-way lines, SHA property lines, SHA easement areas and the locations of structures and signs in the right-of-way and adjacent property.

Plans shall also show the location of all known overhead and underground utility lines, poles and structures in the right-of-way, as well as the locations of any proposed relocations.

6.2-c Existing Vegetation and Preservation. Impacts to existing vegetation on SHA property, within SHA right-of-ways, within SHA easement areas, or on property to be conveyed to SHA shall be clearly described.

Temporary Orange Construction Fence (TOCF) in conformance with EG Chapter 5.3 or other protective fencing may be required to preserve areas from impacts.

- **Existing Groundcover.** Landscape plans shall clearly indicate existing groundcover vegetation. Areas of turfgrass, meadow, planting beds and brush shall be identified or characterized as appropriate. Areas of ornamental vegetation shall be described in detail if they will be impacted.

- **Existing Trees and Large Shrubs.** Landscape plans shall clearly indicate the locations, species, diameter (DBH) and condition of existing trees, and any notably large or ornamental shrubs to be removed or impacted by construction in SHA right-of-ways, SHA easement areas, on SHA property, or on property to be conveyed to SHA.

  Refer to EG Chapter 4.1. The locations of trees, shrubs and other plantings on private property which may impact highway safety or operability shall also be shown on plans.

- **Temporary Orange Construction Fence (TOCF).** Refer to EG Chapters 5.2 and 5.3. Landscape Plans shall clearly indicate and delineate the proposed locations of TOCF as necessary to protect Tree Preservation Areas and any trees, vegetation or sensitive environmental areas to remain.

6.2-d Proposed Vegetation.

- **Trees, Shrubs, Ornamental Plantings.** Landscape plans shall clearly show the locations, species, cultivars, installation sizes and location of all trees, shrubs, perennials and ornamental grasses, etc. to be installed on SHA property, or on property to be conveyed to SHA, or in areas adjacent to SHA property which may impact highway safety or operability.

- **Groundcover Vegetation and Soil Stabilization Matting.** SHA Landscape Notes provide typical guidance regarding installation locations of sod, soil stabilization matting and seeded vegetation such as turfgrass and meadow. However, to ensure successful erosion protection of channels and slopes, and to avoid confusion during construction, the proposed locations of soil stabilization matting shall be delineated on plans as necessary to ensure clarity, and the locations of sod and seeded vegetation shall be indicated. The composition of all of these materials shall conform to SHA Standard Specifications.

6.2-e Planting Schedule and Master Plant List. The species, cultivars and size of plant materials to be installed on SHA property, or on property to be conveyed to SHA shall be selected from the SHA Preferred Plant List (PPL) or as approved, and shall be shown in the Planting Schedule of the landscape plans.

- **Planting Schedule, per sheet.** Each landscape sheet shall include a planting schedule of the plant materials (trees, shrubs, perennials, ornamental grasses, etc.) to be installed per that sheet.

- **Master Plant List.** A master plant list shall be included in the landscape plans when more than one landscape sheet with plant materials is included in the plan set. The master plant list shall include the total quantities of plant materials of the individual planting schedules.

6.2-f Tree Felling and Brush Removal. When trees and brush are included within the limit of disturbance (LOD) of a project, it is expected that they will be removed in their entirety per Section 101 - Clearing and Grubbing of the Standard Specifications unless measures are proposed for their protection. Thus, Tree Felling and Brush Removal operations are typically specified in areas beyond the LOD, and occasionally within Tree Preservation Areas.

Refer to EG Chapter 5.6; and to the Estimating Manual for information about Clearing and Grubbing, Tree Felling and Brush Removal. The landscape plans shall indicate the trees or brush to be removed and the Operations to be performed in conformance with Section 713 and 714 of the Standard Specifications.

Unless other procedures are approved and noted in plans, the Operations of Tree Felling and Brush Removal shall be performed as described below, and pertinent SHA Landscape Notes shall be inserted in conformance with EG Chapter 7.

Tree Felling on SHA property shall be performed by a Maryland Licensed Tree Expert in conformance with the Standard Specifications, the Maryland Tree Expert Law, the Maryland Roadside Tree Law, the Maryland Forest Conservation Act and accepted arboricultural practices.

- **Tree Felling in Turfgrass Areas.** Trees within regularly mowed areas of SHA property shall be felled, the stumps shall be ground, and the debris shall be removed in conformance with Operation 1 - Felling and Stump Removal of Section 714.

- **Tree Felling in Meadow Areas.** Trees within meadow areas of SHA property that are not routinely mowed shall be felled, the stumps shall be treated with herbicide, and the debris shall be removed in conformance with Operation 2 - Felling and Stump Treatment of Section 714. Debris may be chipped and distributed over the soil surface to a depth less than 1 inch.

- **Tree Felling in Naturalized Areas.** Trees in forested areas shall be felled in conformance with Operation 4 - Felling and Delimbing of Section 714.

- **Stump Removal.** Existing stumps may be removed as part of Clearing and Grubbing, or in conformance with Operation 5 - Stump Removal of Section 714.

Brush Removal. Brush Removal on SHA property shall be performed by a Maryland Licensed Tree Expert in conformance with the Standard Specifications. Removing brush is not regulated under the Maryland Roadside Tree Law.

Brush shall be removed from SHA property in conformance with Operation 2 – Brush Removal with Stump Treatment of Section 713. Debris caused by Brush Removal shall be removed from the site or chipped and distributed over the soil in naturalized areas (meadow, brush, forest areas) to a depth less than 1 inch.

6.2-g Tree Branch Pruning, Tree Root Pruning, and Tree Fertilizing. These operations are performed on trees to remain on SHA property, either within designated Tree Preservation Areas, or outside the LOD of a project. The need for branch pruning, root pruning and fertilizing is determined during project design, and must be specified on the plans.

During construction, all of these operations must be performed by a Maryland Licensed Tree Expert in conformance with the Standard Specifications, the Maryland Tree Expert Law, the Maryland Roadside Tree Law and accepted arboricultural practices.

Refer to EG Chapters 5.2 and 5.3, and to the Estimating Manual for more information about Tree Branch Pruning, Tree Root Pruning and Tree Fertilizing. The landscape plans shall indicate the trees and areas where the work will be performed in conformance with Section 712, 715, and 716 of the Standard Specifications.

Unless other procedures are approved and noted in the plans, the Operations shall be performed as described below and the pertinent SHA Landscape Notes shall be inserted in conformance with EG Chapter 7.

- **Tree Branch Pruning** is specified and performed to eliminate dead wood or hazards, or to improve clearance for pedestrians, bicycles, and vehicles, or to improve visibility to signs and traffic control devices.

- **Tree Root Pruning** is specified and performed to reduce construction impacts to trees to remain. Tree Root Pruning is required for the preservation of larger trees when construction impacts are expected to reduce the critical root zone. Tree Root Pruning is usually specified at the edge of the LOD or at the dripline of trees to be preserved, and delineated on the plans. Tree Root Pruning is completed before other construction begins.

- **Tree Fertilizing** is specified performed to reduce construction impacts to trees to remain, or to promote regrowth following Tree Branch Pruning or Tree Root Pruning. Tree Fertilizing will be required when Tree Root Pruning or other construction impacts are expected to reduce the critical root zone.

Chapter 7 - SHA Landscape Notes

7.0 Required SHA Landscape Notes. To ensure the use of approved materials and conformance with SHA construction specifications, all plans developed for an Access Permit, or for a Utility Construction Permit or for a Utility Relocation Permit shall include project-specific SHA Landscape Notes.

District Permits issued for Utility Infrastructure Maintenance / Emergency Permits (Blanket Permits) and Tree Trimming Permits do not require SHA Landscape Notes on plans, but the permit documents shall include necessary permit provisions for operations and landscape restoration.

For all Access Permits and District Utility Construction & Relocation Permits:

- SHA Landscape Notes are not shown on plans when no landscaping per Cat. 700 - Landscaping of the Standard Specifications is required for a project.

- The selection of SHA Landscape Notes depends on the work to be performed. SHA Landscape Notes that do not apply are not reproduced on plans.

- Refer to EG Chapter 6.0-e regarding the note that is reproduced on plan sheets which reference or reproduce non-SHA landscape specifications or non-SHA landscape materials for work on non-SHA property.

- EG Chapters 7.1 through 7.25 describes the conditions and provides the exact text of the SHA Landscape Notes which are included on plans when landscaped areas of SHA property are impacted by construction.

- The Title provided for SHA Landscape Notes in EG Chapter 7.1 and the text of all pertinent Notes shall be reproduced in the italic text provided in Chapter 7.

- When SHA Landscape Notes are necessary, the text of each pertinent Note shall be reproduced under the Title as part of a single list or text box.

- EG Chapter 7.26 includes a table with text of all SHA Landscape Notes.

7.1 Title for SHA Landscape Notes. When SHA Landscape Notes are required, the following Title shall be shown on the plans, and all required Notes shall be included underneath it:

> ***SHA LANDSCAPE NOTES.*** *Landscape construction within SHA property, including right-of-ways, easement areas and lands to be conveyed to SHA shall conform to these Notes. For guidance regarding design modifications during construction, refer to SHA Landscape Design Guide, SHA Landscape Estimating Manual, and SHA Environmental Guide for District, Access, and Utility Permit Applicants at https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .*

7.2 SHA Standard Specifications. Refer to EG Chapter 2.1. When construction involves soil disturbance, seeding, tree installation or installing any other landscaping or plant materials, the following Note shall be inserted into the SHA Landscape Notes:

> ***SHA Standard Specifications.*** *Landscape construction shall conform to Category 700 – Landscaping, and landscape materials shall conform to Section 920, of the most recent revision of SHA Standard Specifications for Construction and Materials, including all revisions and supplements, and as specified in these Notes. The requirements of SHA Specifications shall supersede all other specifications for work on SHA property or property to be conveyed to SHA except as specifically indicated in the plans. Refer to https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=595 .*

7.3 Erosion and Sediment Control Manager (ESCM). In conformance with requirements of the Maryland Department of the Environment and policies of SHA, all projects that involve soil disturbance on SHA property shall be supervised by a certified ESCM.

The ESCM shall possess both the “MDE Green Card” and the “SHA Yellow Card” and shall be present at the construction site during soil disturbance or excavation. The ESCM shall supervise the implementation of any required Erosion and Sediment Control Plan (E&S Plan).

The Maryland Dept. of the Environment (MDE) “Responsible Personnel Training for Erosion and Sediment Control” (“MDE Green Card”) is required for the Basic Erosion and Sediment Control Course (“SHA Yellow Card”). When construction activities require soil disturbance, the following Note shall be inserted into the SHA Landscape Notes:

> ***Erosion and Sediment Control Manager (ESCM).*** *Soil disturbance such as grading, excavation, soil placement or other activities that involve soil disturbance shall be supervised by an ESCM Manager with a valid “SHA Yellow Card” in conformance with SHA Standard Specifications and any applicable Erosion and Sediment Control Permit.*

7.4 SHA Standard Details for Trees, Shrubs and Planting Beds. Refer to EG Chapter 2.4. When landscaping will involve installing trees, shrubs, planting beds and other construction related to Section 710 of the Standard Specifications, the following Note shall be inserted into the SHA Landscape Notes:

SHA Standard Details for Trees, Shrubs and Planting Beds. *The installation of trees, shrubs, planting beds and other landscape construction related to Section 710 of the SHA Standard Specifications shall conform to the SHA Book of Standards for Highway & Incidental Structures - Category 7 at http://apps.roads.maryland.gov/BusinessWithSHA/bizStdsSpecs/desManualStdPub/publicationsonline/ohd/bookstd/toccat7.asp.*

7.5 Temporary Stabilization. Refer to Chapter 704 of the Estimating Manual. When construction will remove pavement, or will involve any other activities such as grading, tilling or other disturbance the leaves the soil of vulnerable to erosion from wind, rainfall or flowing water, the following Note shall be inserted into the SHA Landscape Notes:

Temporary Stabilization *shall be installed in conformance with Section 704 to ensure that areas of soil disturbance are protected from wind, rainfall and flowing water until permanent stabilization is installed.*

1. *Temporary Mulch, either as temporary straw mulch or temporary matting mulch, shall be installed at the end of each working day to provide "same day stabilization" unless other approved stabilization is installed.*

2. *Temporary straw mulch shall be installed on areas and slopes flatter than 4:1; temporary matting mulch shall be applied on slopes 4:1 and steeper, and to areas within channels.*

7.6 Pavement Removal and Restoration. Refer to EG Chapter 5.6 and 5.7; and to Chapter 701 of the Estimating Manual. An excavation depth of 16 inches is necessary for roadway pavement removal, and a depth of 6 inches is necessary for sidewalk and driveway pavement removal.

When landscaping involves removing pavements in preparation for restoring landscaped areas for permanent vegetation, the following Note shall be inserted into the SHA Landscape Notes:

Pavement Removal and Restoration. *Areas of pavement removal shall be excavated to remove pavements, aggregate base, compacted soil and other unsuitable materials before placing soils in conformance with Section 701 of the SHA Standard Specifications.*

1. *Roadways shall be excavated to a depth of 16 inches below final grade before Placing Furnished Subsoil 12 in. Depth and Placing Furnished Topsoil 4 in. Depth in conformance with Note 7.8.*

2. *Sidewalks and driveways shall be excavated to a depth of 6 inches below final grade before Placing Furnished Topsoil 6 in. Depth in conformance with Note 7.8.*

7.7 Excavation and Debris Removal. Refer to EG Chapters 5.6 and 5.7. When landscaping involves removing sidewalks, paved or gravel driveways, curbs, trees, stumps, fencing, abandoned pipes and similar construction debris in preparation for restoring landscaped areas for permanent vegetation, the following Note shall be inserted into the SHA Landscape Notes:

Excavation and Debris Removal. *Debris related to the demolition of sidewalks, driveways, curbs, trees, stumps, roots, fencing, pipes, and other materials that may interfere with landscape installation or future maintenance shall be excavated as necessary for their complete removal and disposal.*

7.8 Soil Restoration. Refer to EG Chapters 5.6 and 5.7; and to Chapter 701 of the Estimating Manual. Soil restoration may involve excavation followed by restoration with subsoil and topsoil, or restoration with bioretention soil mix (BSM) and related materials in stormwater management facilities. The requirements are determined by the Office of Environmental Design and Highway Hydraulics Division.

When landscaping involves excavating pavement, utility trenching, drilling or any similar work in preparation for restoring landscaped areas for permanent vegetation, the following Note shall be inserted into the SHA Landscape Notes:

> ***Soil Restoration.*** *Areas of pavement removal, excavation or drilling in landscaped areas shall remove excavated debris and restore topsoil placed in conformance with Section 701 of the SHA Standard Specifications.*
>
> 1. *A layer of approved topsoil at least 4-inch depth shall be placed on all disturbed areas flatter than 2:1 and in all channels before seeding, sodding or other landscaping, unless otherwise specified on the plans as when required for pavement removal and restoration.*
> 2. *A layer of approved topsoil at least 2-inch depth shall be placed on all disturbed areas 2:1 and steeper before seeding, sodding or other landscaping, unless otherwise specified.*

When stormwater infiltration facilities are proposed, the following Note shall be added to the foregoing:

> 3. *Bioretention Soil Mix (BSM) and other materials installed in conjunction with Section 316 - Stormwater Filtration Facilities and SHA stormwater details shall be installed in conformance with SHA Landscape Notes and landscape plans. Plant materials and mulch shall be installed in BSM in conformance with stormwater details, Section 710 or other SHA Specifications.*

7.9 Turfgrass Sod Establishment. Refer to EG Chapters 5.7 and 6.2-d, and to Chapter 708 of the Estimating Manual. When landscaping involves restoring turfgrass sod in urban or suburban areas, or areas that are adjacent to commercial or residential properties where pedestrians may be expected, or where stormwater is conveyed in grass-lined channels, the groundcover vegetation of areas impacted by construction shall be restored with turfgrass sod, and the following Note shall be inserted into the SHA Landscape Notes:

> ***Turfgrass Sod Establishment*** *shall be performed in all disturbed areas, or within the areas indicated in the plans, in conformance with Section 708 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 708. No fertilizer shall be applied from November 15 to March 1.*

7.10 Turfgrass Establishment. Refer to EG Chapters 5.7 and 6.2-d, and to Chapter 705 of the Estimating Manual. When landscaping involves restoring turfgrass in rural areas, the groundcover vegetation of areas impacted by construction shall be restored with Turfgrass Establishment (seeding) and the following Note shall be inserted into the SHA Landscape Notes:

Turfgrass Establishment *shall be performed in all disturbed areas, or within the areas indicated in the plans, in conformance with Section 705 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 705. No fertilizer shall be applied from November 15 to March 1.*

7.11 Soil Stabilization Matting. Refer to EG Chapters 5.7 and 6.2-d, and to Chapters 705 and 709 of the Estimating Manual. The types of soil stabilization matting and their specific uses are described in the Estimating Manual.

When landscaping involves Turfgrass Establishment or Meadow Establishment, the following Note, with numbers 1-3, shall be inserted into the SHA Landscape Notes:

S*oil Stabilization Matting* *shall be installed in conformance with Section 709 of the SHA Standard Specifications, in conjunction with Turfgrass Establishment per Section 705 or Meadow Establishment per Section 707 as follows:*

1. *Areas Flatter than 6:1. Type A or Type E matting may be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment.*
2. *Areas Steeper than 6:1 and Flatter than 4:1. Type A or Type E matting shall be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment, unless delineated and noted otherwise.*
3. *Channels, Stormwater Management Facilities, and Slopes 4:1 and Steeper Type A Soil Stabilization Matting shall be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment, unless delineated and noted otherwise.*

When stormwater management facilities (SWM), stream restoration areas, channels, or other delineated areas are specified for installing Meadow Establishment and Type D Soil Stabilization Matting such as the surface of infiltration facilities, the following Note shall be added to the foregoing:

4. *In areas of Meadow Establishment with Type D Soil Stabilization Matting, the matting shall be installed in lieu of straw mulch and hydromulch binder within the delineated areas.*

When channels meet flow velocity or shear stress requirements for Type B Soil Stabilization Matting as defined in the Estimating Manual the area of Type B SSM shall be delineated and the following Note shall be added to the foregoing:

5. *In high velocity channels with Turfgrass Establishment, Type B Soil Stabilization Matting shall be installed in lieu of straw mulch and hydromulch binder within the delineated areas.*

7.12 Meadow Establishment or Shrub Seeding Establishment. Refer to EG Chapters 5.8 and 6,2-d, and to Chapters 706 and 707 of the Estimating Manual.

When landscaping involves restoring meadow in areas that are mowed one time or less per year, or involves Shrub Seeding Establishment in natural areas that are not mowed, the groundcover vegetation of areas impacted by construction shall be restored with Meadow Establishment or Shrub Seeding Establishment as described in the plans, and the following Note shall be inserted into SHA Landscape Notes:

Meadow Establishment or Shrub Seeding Establishment *shall be performed in areas as indicated in the plans, in conformance with Sections 706 and 707 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 706 or 707. No fertilizer shall be applied from November 15 to March 1.*

7.13 Tree Preservation Areas. Refer to EG Chapters 5.3-b and 6.2-c, and to Section 120 - Tree Preservation Areas of the Standard Specifications. When trees or other vegetation to remain is included with the Limits of Disturbance, or areas that require protection are adjacent to the Limits of Disturbance, the trees or other vegetation to be protected shall be indicated in the plans.

Areas surrounded by Temporary Orange Construction Fence (TOCF) are considered Tree Preservation Areas per Section 120 and are protected from certain prohibited and restricted activities in conformance with those specifications. Such areas must be protected with TOCF during construction, and the plans shall clearly delineate the Tree Preservation Area using that term, or any of the following abbreviations: TPA, TOCF, or TPF (tree protection fence). The following Note shall be inserted into the SHA Landscape Notes:

Tree Preservation Areas. *Temporary Orange Construction Fence (TOCF) shall be installed in locations delineated on the plans as Tree Preservation Areas (TPA) in conformance with Section 120 of the SHA Standard Specification to protect existing trees and other vegetation during construction. Areas within TOCF shall be protected from all prohibited and restricted activities, per Section 120.*

7.14 Roadside Tree Individual Permit (RTIP). Refer to EG Chapter 4.1. A Roadside Tree Permit issued by the Maryland Department of Natural Resources – Forest Service is required when trees or other woody vegetation is removed, pruned or installed. The applicant is responsible for all coordination required to obtain this permit.

No tree or woody plant removals, pruning or installation may be performed within SHA right-of-ways unless a Roadside Tree Permit has been issued, and a copy of the permit has been submitted to the Office of Environmental Design.
No tree, shrub or brush removal, pruning or installation may be performed in any SHA right-of-ways, SHA easement areas, or property of SHA without an approved SHA permit.

The RTIP is a separate permit requirement of the Maryland Department of Natural Resources for certain regulated activities in public right-of-ways within the state of Maryland.

When landscaping requires a Roadside Tree Permit, or requires compliance with the Maryland Forest Conservation Act, the following Note shall be inserted into the SHA Landscape Notes:

Roadside Tree Permit. *Tree removal, tree installation, tree root and branch pruning, and other regulated impacts to trees in the SHA right-of-way shall conform to the requirements of the Roadside Tree Individual Permit (RTIP) issued by the Maryland Department of Natural Resources, or the approved Forest Conservation Plan (FCP) of the local authority.*

1. *A copy of the RTIP or FCP shall be submitted to the SHA Landscape Programs Division before work is performed, and a copy of the RTIP or FCP shall be reproduced in the plans or be in possession of the applicant at the project site when the permitted work is performed.*

2. *A Maryland Licensed Tree Expert shall perform the specified tree operations in conformance with the SHA Standard Specifications and ANSI A300 Standards for Tree Care Operations.*

7.15 Installation of Trees, Shrubs, other Landscape Plantings. Refer to EG Chapters 4.1-b, c, d; to EG Chapter 5.9; and to Chapter 710 of the Estimating Manual. When landscaping involves installing trees, shrubs, perennials, landscape beds, annuals, bulbs, shredded hardwood bark mulch or other landscape plants or materials, the following Note shall be inserted into the SHA Landscape Notes:

Trees and Other Plant Material Installation. *Trees, shrubs, perennials, annuals, bulbs, landscape beds, bark mulch and similar materials shall be installed in conformance with Section 710 and 711 of the SHA Standard Specifications. The SHA Landscape Programs Division will approve materials and layout, and perform other approvals and inspections in conformance with Standard Specifications. Trees and shrubs shall be pruned at the time of installation to ensure sidewalk clearance for pedestrians is maintained to a height of 8 feet. No tree or shrub shall be installed within 3 feet of curbs, sidewalks, or pavement edges.*

7.16 Brush Removal. Refer to EG Chapters 5.6, 5.7, 6.2-c; and to Chapter 713 of the Estimating Manual. When landscaping involves Brush Removal that is not within the limit of disturbance or within areas of Clearing and Grubbing, the areas of Brush Removal shall be identified in the landscape plans and the following Note shall be inserted into the SHA Landscape Notes:

Brush Removal *shall be performed in conformance with Operation 2 - Brush Removal with Stump Treatment of Section 713. Debris shall be removed, or chipped and distributed on SHA property to a maximum depth of 1 inch within brush removal areas, or in meadow or forest areas.*

7.17 Tree Felling in Turfgrass Areas. Refer to EG Chapters 5.6; and 6.2-c; and to Chapter 714 of the Estimating Manual. When landscaping involves Tree Felling in turfgrass areas that are routinely mowed, but not within the limit of disturbance or areas of Clearing and Grubbing, the trees to be felled shall be identified in the plans and the following Note shall be inserted into the SHA Landscape Notes:

Tree Felling in Turfgrass Areas *shall be performed in conformance with Operation 1 - Felling and Stump Removal of Section 714. All debris shall be removed from SHA property.*

7.18 Tree Felling in Meadow Areas. Refer to EG Chapters 5.6 and 6.2-c; and to Chapter 714 of the Estimating Manual. When landscaping involves Tree Felling in meadow areas that are not routinely mowed, but not within the limit of disturbance or areas of Clearing and Grubbing, the trees to be felled shall be identified in the landscape plans and the following Note shall be inserted into the SHA Landscape Notes:

Tree Felling in Meadow Areas *shall be performed in conformance with Operation 2 - Felling and Stump Treatment of Section 714. All debris shall be removed, or chipped and distributed within meadow areas of SHA property, to a maximum depth of 1 inch.*

7.19 Tree Felling in Natural Areas. Refer to EG Chapters 5.6 and 6.2-c; and to Chapter 714 of the Estimating Manual. When landscaping involves Tree Felling in naturalized areas, but not within the limit of disturbance or areas of Clearing and Grubbing, the trees to be felled shall be identified in the landscape plans, and the following Note shall be inserted into the SHA Landscape Notes:

Tree Felling in Natural Areas *shall be performed in conformance with Operation 4 - Felling and Delimbing of Section 714.*

7.20 Stump Removal. Refer to EG Chapter 5.6; and to Chapter 714 of the Estimating Manual. When landscaping involves removing existing dead tree stumps in turfgrass or meadow areas, but not within the limit of disturbance or areas of Clearing and Grubbing, the stumps to be removed shall be identified in the landscape plans, and the following Note shall be inserted into the SHA Landscape Notes:

Stump Removal *in turfgrass or meadow areas shall be performed in conformance with Operation 5 - Stump Removal of Section 714.*

7.21 Tree Branch Pruning. Refer to EG Chapters 5.3 and 5.4, and to Chapter 712 of the Estimating Manual. When landscaping involves removing branches from existing trees, the trees to be pruned shall be identified in the landscape plans. Either of the following Notes may be inserted.

Option 1. When minor branch pruning is anticipated, the following Note may be inserted into the SHA Landscape Notes:

Tree Branch Pruning *shall be performed or directly supervised by a Maryland Licensed Tree Expert in conformance with ANSI A300 standards per Section 712 as necessary for any of the following: To install Temporary Orange Construction Fence (TOCF) along delineations on plans; to perform Tree Root Pruning along delineations on plans; to provide 8-foot clearance above sidewalk pavements and 16-foot clearance above roadway pavements; to repair tree wounds; and to perform other recommended cleaning, thinning, reducing, and pruning necessary to accommodate utilities. All debris shall be removed from SHA property.*

Option 2. When major branch pruning is anticipated, the following Note shall be inserted along with, or instead of, the foregoing into the SHA Landscape Notes. The *red underlined text* shall be removed by the applicant and replaced with customized text to specify the pruning:

Tree Branch Pruning *shall be performed in conformance with Section 712 as follows: Applicant to explain goals and locations of pruning. All debris shall be removed from SHA property.*

7.22 Tree Root Pruning. Refer to EG Chapter 5.3 and Chapter 715 of the Estimating Manual. When landscaping involves tree root pruning, the trees to be pruned shall be identified in the landscape plans, and the following Note with instructions for the pruning shall be inserted into the SHA Landscape Notes:

> ***Tree Root Pruning*** *shall be performed along the line shown on the plans in conformance with Section 715. Tree Root Pruning shall be completed before beginning excavation or construction adjacent to trees to be preserved.*

7.23 Tree Fertilizing. Refer to EG Chapter 5.3 and Chapter 716 of the Estimating Manual. When landscaping involves tree fertilizing, the trees to be fertilized shall be identified in the landscape plans. The following shall be inserted into the SHA Landscape Notes for Tree Fertilizing, or modified as appropriate to specify the fertilizer materials and methods:

> ***Tree Fertilizing*** *shall be performed in conformance with Operation 3 - Broadcast Fertilizing per Section 716. 20-16-12 fertilizer shall be applied to the soil surface under the dripline of trees at the rate of 200 pounds per acre.*

7.24 Finished Materials. Refer to EG Chapter 5.10. When landscaping involves installing retaining walls, stone mulch, unit pavers, decorative light poles, trash receptacles, bike racks and other materials with specially colored or decorative finishes, the materials shall be specified, and their locations indicated in the landscape plans.

Such finished materials shall match the color and quality of existing nearby materials, or shall be determined to be acceptable alternatives. The following shall be inserted into the SHA Landscape Notes, except the *red underlined text* shall be removed by the applicant and replaced with customized text to specify the finished materials or plan sheet where such specifications are reproduced:

> ***Finished Materials.*** *The suitability, color and texture of applicant to insert name of materials with references to pages of the plans which specify these materials to be installed shall be approved before installation. The contractor shall furnish samples or make arrangements for inspection and approval at the project site.*

7.25 Future Maintenance. Refer to EG Chapter 5.11. An Access Permit does not confer any future right to maintain materials installed within SHA right-of-ways, or within SHA property or easement areas. For that purpose, a District or Utility Permit is required, which is issued separately.

When landscaping involves installing hardscape, street furniture, trees, shrubs, perennials, annuals, planting beds or any other landscape materials for which additional maintenance is appropriate or desirable under a future District Permit, the following Note shall be inserted into the SHA Landscape Notes:

> ***Future Maintenance.*** *Additional maintenance that may be required after hardscape, street furniture or plant materials are installed and accepted by SHA such as replacement, watering, weeding, mulching or pest control may be provided by the applicant when a permit for the proposed work is issued by the SHA District Office.*

7.26 Quick Guide to SHA Landscape Notes.

The following table summarizes the required SHA Landscape Notes described in EG Chapters 7.0 through 7.25. Numbers refer to Sections of the EG.

Refer to EG Chapter 6.0-e regarding the note which must be inserted onto sheets with non-SHA landscape construction or non-SHA landscape materials.

When SHA Landscape Notes are required for a project, the Title and text of all pertinent Notes shall be reproduced in the landscape plans, or in another appropriate location within the plan set, as a single list or in a single text box.

The Title "SHA Landscape Notes" shall be placed as a prominent heading, and the text of each required Note shall be shown under the title in the numerical order indicated in EG Chapter 7.

SHA Landscape Notes specify required construction activities. Notes that do not apply to a project shall not be included in the SHA Landscape Notes.

Environmental Guide Chapter Number and Subject	Title and Text of SHA Landscape Notes
	The applicant shall insert the Title, along with the Chapter Number, Subject, and Text of each pertinent Note, in the order shown below. Some Notes with *red underlined text* require customized text to be inserted by the applicant. Refer to EG Chapter 6.0-e regarding the note that is inserted on plan sheets when non-SHA standards are reproduced. Refer to EG Chapter 4.1-e regarding the note that is inserted on plan sheets when SHA tree mitigation requirements are waived.
7.1 Title	***SHA LANDSCAPE NOTES.*** *Landscape construction within SHA property, including right-of-ways, easement areas and lands to be conveyed to SHA shall conform to these Notes. For guidance regarding design modifications during construction, refer to SHA Landscape Design Guide, SHA Landscape Estimating Manual, and SHA Environmental Guide for District, Access, and Utility Permit Applicants at https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=25 .*
7.2 Specifications	***SHA Standard Specifications.*** *Landscape construction shall conform to Category 700 – Landscaping, and landscape materials shall conform to Section 920, of the most recent revision of SHA Standard Specifications for Construction and Materials, including all revisions and supplements, and as specified in these Notes. The requirements of SHA Specifications shall supersede all other specifications for work on SHA property or property to be conveyed to SHA except as specifically indicated in the plans. Refer to https://www.roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=595 .*
7.3 E&S Manager |ESCM	***Erosion and Sediment Control Manager (ESCM).*** *Soil disturbance such as grading, excavation, soil placement or other activities that involve soil disturbance shall be supervised by an ESCM Manager with a valid "SHA Yellow Card" in conformance with SHA Standard Specifications and any applicable Erosion and Sediment Control Permit.*
7.4 Standard Details	***SHA Standard Details for Trees, Shrubs and Planting Beds.*** *The installation of trees, shrubs, planting beds and other landscape construction related to Section 710 of the SHA Standard Specifications shall conform to the SHA Book of Standards for Highway & Incidental Structures - Category 7 at http://apps.roads.maryland.gov/BusinessWithSHA/bizStdsSpecs/desManualStdPub/publicationsonline/ohd/bookstd/toccat7.asp .*

7.5	Temporary Stabilization	***Temporary Stabilization*** *shall be installed in conformance with Section 704 to ensure that areas of soil disturbance are protected from wind, rainfall and flowing water until permanent stabilization is installed.* 1. *Temporary Mulch, either as temporary straw mulch or temporary matting mulch, shall be installed at the end of each working day to provide "same day stabilization" unless other approved stabilization is installed.* 2. *Temporary straw mulch shall be installed on areas and slopes flatter than 4:1; temporary matting mulch shall be applied on slopes 4:1 and steeper, and to areas within channels.*
7.6	Pavement Removal and Restoration	***Pavement Removal and Restoration.*** *Areas of pavement removal shall be excavated to remove pavements, aggregate base, compacted soil and other unsuitable materials before placing soils in conformance with Section 701 of the SHA Standard Specifications.* 1. *Roadways shall be excavated to a depth of 16 inches below final grade before Placing Furnished Subsoil 12 in. Depth and Placing Furnished Topsoil 4 in. Depth in conformance with Note 7.8.* 2. *Sidewalks and driveways shall be excavated to a depth of 6 inches below final grade before Placing Furnished Topsoil 6 in. Depth in conformance with Note 7.8.*
7.7	Excavation and Debris Removal	***Excavation and Debris Removal.*** *Debris related to the demolition of sidewalks, driveways, curbs, trees, stumps, roots, fencing, pipes and other materials that may interfere with landscape installation or future maintenance shall be excavated as necessary for their complete removal and disposal.*
7.8	Soil Restoration	***Soil Restoration.*** *Areas of pavement removal, excavation or drilling in landscaped areas shall remove excavated debris and restore topsoil placed in conformance with Section 701 of the SHA Standard Specifications.* 1. *A layer of approved topsoil at least 4-inch depth shall be placed on all disturbed areas flatter than 2:1 and in all channels before seeding, sodding or other landscaping, unless otherwise specified on the plans as when required for pavement removal and restoration.* 2. *A layer of approved topsoil at least 2-inch depth shall be placed on all disturbed areas 2:1 and steeper before seeding, sodding or other landscaping, unless otherwise specified.*
	Add When Necessary	3. *Bioretention Soil Mix (BSM) and other materials installed in conjunction with Section 316 - Stormwater Filtration Facilities and SHA stormwater details shall be installed in conformance with SHA Landscape Notes and landscape plans. Plant materials and mulch shall be installed in BSM in conformance with stormwater details, Section 710 or other SHA Specifications.*
7.9	Turfgrass Sod Establishment	***Turfgrass Sod Establishment*** *shall be performed in all disturbed areas, or within the areas indicated in the plans, in conformance with Section 708 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 708. No fertilizer shall be applied from November 15 to March 1.*
7.10	Turfgrass Establishment	***Turfgrass Establishment*** *shall be performed in all disturbed areas, or within the areas indicated in the plans, in conformance with Section 705 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 705. No fertilizer shall be applied from November 15 to March 1.*
7.11	Soil Stabilization Matting	***Soil Stabilization Matting*** *shall be installed in conformance with Section 709 of the SHA Standard Specifications, in conjunction with Turfgrass Establishment per Section 705 or Meadow Establishment as follows:* 1. *Areas Flatter than 6:1. Type A or Type E matting may be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment.* 2. *Areas Steeper than 6:1 and Flatter than 4:1. Type A or Type E matting shall be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment, unless delineated and noted otherwise.* 3. *Channels, Stormwater Management Facilities, and Slopes 4:1 and Steeper. Type A Soil Stabilization Matting shall be installed in lieu of straw mulch and hydromulch binder in conjunction with Turfgrass Establishment, unless delineated and noted otherwise.*

	Add When Necessary	4. *In areas of Meadow Establishment with Type D Soil Stabilization Matting, the matting shall be installed in lieu of straw mulch and hydromulch binder within the delineated areas.*
	Add When Necessary	5. *In high velocity channels with Turfgrass Establishment, Type B Soil Stabilization Matting shall be installed in lieu of straw mulch and hydromulch binder within the delineated areas.*
7.12	**Meadow, Shrub Establishment**	***Meadow Establishment or Shrub Seeding Establishment*** *shall be performed in areas as indicated in the plans, in conformance with Sections 706 and 707 of the SHA Standard Specifications. The required application rate of 20-16-12 fertilizer shall be 200 pounds per acre, or shall be equivalent fertilizer and application rate as specified in Section 706 or 707. No fertilizer shall be applied from November 15 to March 1.*
7.13	**Tree Preservation Areas**	***Tree Preservation Areas.*** *Temporary Orange Construction Fence (TOCF) shall be installed in locations delineated on the plans in conformance with Section 120 of the SHA Standard Specification to protect existing trees and other vegetation during construction. Areas within TOCF shall be protected from all prohibited and restricted activities, as specified in Section 120.*
7.14	**Roadside Tree Permit**	***Roadside Tree Permit.*** *Tree removal, tree installation, tree root and branch pruning and other regulated impacts to trees in the SHA right-of-way shall conform to the requirements of the Roadside Tree Individual Permit (RTIP) issued by the Maryland Department of Natural Resources, or the approved Forest Conservation Plan (FCP) of the local authority.* 1. *A copy of the RTIP or FCP shall be submitted to the SHA Landscape Programs Division before work is performed, and a copy of the RTIP or FCP shall be reproduced in the plans or be in possession of the applicant at the project site when the permitted work is performed.* 2. *A Maryland Licensed Tree Expert shall perform the specified tree operations in conformance with the SHA Standard Specifications and ANSI A300 Standards for Tree Care Operations.*
7.15	**Trees, Plant Materials Installation**	***Trees and Other Plant Material Installation.*** *Trees, shrubs, perennials, annuals, bulbs, landscape beds, bark mulch and similar materials shall be installed in conformance with Section 710 and 711 of the SHA Standard Specifications. The SHA Landscape Programs Division will approve materials and layout, and perform other approvals and inspections in conformance with Standard Specifications. Trees and shrubs shall be pruned at the time of installation to ensure sidewalk clearance for pedestrians is maintained to a height of 8 feet. No tree or shrub shall be installed within 3 feet of curbs, sidewalks or pavement edges.*
7.16	**Brush Removal**	***Brush Removal*** *shall be performed in conformance with Operation 2 - Brush Removal with Stump Treatment of Section 713. Debris shall be removed, or chipped and distributed to a maximum depth of 1 inch within brush removal areas, or in meadow or forest areas.*
7.17	**Tree Felling Turfgrass Areas**	***Tree Felling in Turfgrass Areas*** *shall be performed in conformance with Operation 1 - Felling and Stump Removal of Section 714. All debris shall be removed from SHA property.*
7.18	**Tree Felling Meadow Areas**	***Tree Felling in Meadow Areas*** *shall be performed in conformance with Operation 2 - Felling and Stump Treatment of Section 714. All debris shall be removed, or chipped and distributed within meadow areas of SHA property, to a maximum depth of 1 inch.*
7.19	**Tree Felling Natural Areas**	***Tree Felling in Natural Areas*** *shall be performed in conformance with Operation 4 - Felling and Delimbing of Section 714.*
7.20	**Stump Removal**	***Stump Removal*** *in turfgrass or meadow areas shall be performed in conformance with Operation 5 - Stump Removal of Section 714.*

7.21	Tree Branch Pruning	**Option 1 - Insert the following Note for projects that involve minor pruning:** ***Tree Branch Pruning*** *shall be performed or directly supervised by a Maryland Licensed Tree Expert in conformance with ANSI A300 standards per Section 712 as necessary for any of the following: To install Temporary Orange Construction Fence (TOCF) along delineations on plans; to perform Tree Root Pruning along delineations on plans; to provide 8-foot clearance above sidewalk pavements and 16-foot clearance above roadway pavements; to repair tree wounds; and to perform other recommended cleaning, thinning, reducing and pruning necessary to accommodate utilities. All debris shall be removed from SHA property.* **Option 2 - Insert the following Note with specific instructions for major pruning:** ***Tree Branch Pruning*** *shall be performed in conformance with Section 712 as follows: Applicant to explain goals and locations of pruning. All debris shall be removed from SHA property.*
7.22	Tree Root Pruning	***Tree Root Pruning*** *shall be performed along the line shown on the plans in conformance with Section 715. Tree Root Pruning shall be completed before beginning excavation or other construction adjacent to trees to be preserved.*
7.23	Tree Fertilizing	***Tree Fertilizing*** *shall be performed in conformance with Operation 3 - Broadcast Fertilizing per Section 716. 20-16-12 fertilizer shall be applied to the soil surface under the dripline of trees at the rate of 200 pounds per acre.*
7.24	Finished Materials	***Finished Materials.*** *The suitability, color and texture of applicant to insert name of materials with references to pages of the plans which specify these materials to be installed shall be approved before installation. The contractor shall furnish samples or make arrangements for inspection and approval at the project site.*
7.25	Future Maintenance	***Future Maintenance.*** *Additional maintenance that may be required after hardscape, street furniture or plant materials are installed and accepted by SHA such as replacement, watering, weeding, mulching or pest control may be provided by the applicant when a permit for the proposed work is issued by the SHA District Office.*

Chapter 8 - Environmental Quality Assurance Checklist

8.0 Environmental Quality Assurance Checklist. Applicants who develop plans, specifications and estimates for permit submittals are encouraged to perform a self-assessment. Use of this Checklist is not required.

Note: A similar checklist is used when OED returns comments to the District Office as part of permit submittal reviews.

Environmental Quality Assurance Checklist		
Chapter of EG	**Items to Confirm by Applicant**	**Verified**
General Conformance		
2.1	Project conforms to most recent versions of SHA Standard Specifications.	☐
2.2	Project conforms to principles of the SHA Landscape Design Guide (LDG).	☐
2.3	Project conforms to principles of the SHA Landscape Estimating Manual.	☐
2.3	Engineer's Estimate includes all items for landscape and bioretention facilities.	☐
2.4	Project conforms to SHA Book of Standards - Category 700, Landscaping.	☐
2.5	Project conforms to SHA Preferred Plant List (PPL).	☐
3.0	Project involves OED review concerns and will require OED review.	☐
Permitting & Mitigation		
4.0	Project submittal identifies the appropriate SHA Permit.	☐
4.1	Project requires Roadside Tree Individual Permit (RTIP) or FCA Approval.	☐
4.1	Project mitigates canopy impacts to roadside trees and other vegetation.	☐
4.2	Project mitigates impacts to wetlands and waterways.	☐
4.3	Project mitigates impacts to Chesapeake and Atlantic Coastal Bays Critical Areas.	☐
4.4	Project mitigates impacts or provides new OED Managed Landscape Assets.	☐
4.5	Project mitigates impacts or provides new MS4 / TMDL Facilities.	☐
4.6	Project mitigates impacts or provides new OED Mitigation Sites.	☐
Special Landscape Concerns		
5.1	Project provides acceptable environmental area protection.	☐
5.2 - 5.3	Project meets requirements for Tree Preservation Areas and pruning standards.	☐
5.4	Project meets requirements for offset distance for roadways, utilities, etc.	☐
5.5	Project meets requirements for demolition, excavation, and site restoration.	☐
5.6	Project meets requirements for landscape restoration with subsoil and topsoil.	☐
5.7	Project meets requirements for restoration of turfgrass.	☐
5.8	Project meets requirements for restoration of meadow and naturalized areas.	☐
5.9	Project meets requirements for restoration of trees, shrubs and landscape beds.	☐
5.10	Project meets requirements for installing and restoring structures, hardscape, etc.	☐
5.11	Project will require additional future maintenance by applicant, not SHA.	☐
5.12	Utility maintenance permit includes clear guidance for operations and mitigation.	☐
Roadway, E&S, Stormwater Management Plans, etc.		
6.0	Plans are developed in conformance with SHA standards.	☐
6.0	Plan sheets of all plan sets do not conflict with landscape plans.	☐
6.0-e	Plans include required note, or non-SHA landscape standards are removed.	☐
Plans for Landscape Restoration		
6.0	Project meets standards for preparation of plans for landscape construction.	☐
6.0-e	for required note for any non-SHA landscape specifications and materials.	☐

6.1	for professional seal, accuracy and clarity of presentation.	☐
6.2-a	for right-of-way line, route number and name, posted speed, graphic scale, etc.	☐
6.2-b	for delineation of overhead and underground utilities, signs, etc.	☐
6.2-c	for delineation of existing trees, shrubs, brush, groundcover, TOCF, etc.	☐
6.2-d	for delineation of proposed trees, shrubs, ornamental plantings, etc.	☐
6.2-d	for delineation of turfgrass, sod, meadow, soil stabilization matting, etc.	☐
6.2-e	for planting schedule, plant keys and labels, master plant list.	☐
6.2-f	for delineating or noting locations of Tree Felling, Brush Removal.	☐
6.2-g	for specifying and indicating locations of Tree Branch Pruning.	☐
6.2-g	for delineating Tree Root Pruning and locations of Tree Fertilizing.	☐
SHA Landscape Notes		
7.0 - 7.1	Project includes Title and current text of all pertinent SHA Landscape Notes.	☐
7.2	for SHA Cat 700. Landscaping Specifications.	☐
7.3	for Erosion and Sediment Control Manager (ESCM).	☐
7.4	for Standard Details for installing trees, shrubs, planting beds, etc.	☐
7.5	for Temporary Stabilization, for same day stabilization in all disturbed areas.	☐
7.6 - 7.7	for Pavement Removal, including excavation and debris removal.	☐
7.8	for Soil Restoration, Bioretention Soil Mix (BSM), SWM filtration facilities.	☐
7.9	for Turfgrass Sod Establishment in urban, pedestrian, and other areas.	☐
7.10 - 7.11	for Turfgrass Establishment (seeding) and Soil Stabilization Matting.	☐
7.12	for Bioretention or other Meadow Establishment, Shrub Seeding Establishment.	☐
7.13	for Tree Preservation Areas, Temporary Orange Construction Fence (TOCF).	☐
7.14	for Roadside Tree Individual Permit (RTIP) / Forest Conservation Act Approval (FCA).	☐
7.15	for Installation of Trees, Shrubs, Perennials, other plant materials, and inspection.	☐
7.16	for Brush Removal outside areas of Clearing and Grubbing.	☐
7.17 - 7.19	for Tree Felling Operations outside areas of Clearing and Grubbing.	☐
7.20	for Stump Removal of existing dead stumps.	☐
7.21	for minor Tree Branch Pruning, using the standard Note.	☐
	for major Tree Branch Pruning, using a Note modified by the applicant.	☐
7.22	for Tree Root Pruning at limit of disturbance, along Tree Preservation Area.	☐
7.23	for Tree Fertilizing to reduce construction impacts on trees to remain.	☐
7.24	for Finished Materials, such as decorative pavers, stone walls, benches, etc.	☐
7.25	for Future Maintenance, where likely needed and performed by applicant.	☐