

IV. PRODUCT DELIVERY, STORAGE AND HANDLING

4.1. GENERAL

- A. The Contractor shall use all means necessary to protect materials and products before, during, and after installation.
- B. Material and products shall be loaded, transported, and unloaded in accordance with the recommendations of the material and product Supplier. All required certifications shall be supplied with each delivery and have valid certifications to substantiate the material received with the certifications supplied.
- C. Materials and products shall be stored so as to assure the preservation of quality and fitness for the Work.

4.2. ASPHALT

- A. Shipments of asphalt material shall be made in transporting media that are free from contamination. Tank trucks or trailers shall be equipped with a sampling device approved by the Owner.
- B. Asphalt material to be stored shall be placed in storage tanks that are free from contamination.

4.3. AGGREGATE

- A. Stockpiles of all materials shall be constructed on areas that are hard, well drained, and denuded of vegetation. The different sizes and kinds of aggregates shall be kept separate during handling and storage until batched. Care shall be taken to prevent segregation of coarse and fine particles during handling and storing.
- B. Aggregates placed directly on the ground for stockpiling purposes, shall not be removed from those stockpiles within 1 foot of the ground until final cleanup. The Owner will only permit the use of clean aggregates removed from within 1 foot of the ground.
- C. Materials shall be handled in a manner that will preserve their quality and fitness for the Work. Aggregates shall be transported from storage to the project in vehicles constructed to prevent loss or segregation of materials.
- D. All material stockpiles shall be maintained in accordance with the Virginia Erosion and Sediment Control Handbook.

4.4. CONCRETE ITEMS

A. Cement

- 1. Cement that is reclaimed or that shows evidence of hydration, such as lumps or cakes, shall not be used.
- 2. Loose cement shall be transported to the mixer either in tight compartments for each batch or between the fine and coarse aggregate. Cement in original shipping packages may be transported on top of the aggregates, with each batch containing the number of bags required.

B. Aggregates

1. Aggregate shall be kept separated by size until batched. Aggregates shall be clean and shall be maintained in at least a surface-dry condition.
2. Fine aggregate that has been washed shall not be used within 24 hours after being placed in the stockpile or until surplus water has disappeared and the material has a consistent free moisture content. Stockpiles shall be located and constructed so that surplus water will drain from stockpiles and the batcher.
3. Materials shall be handled in a manner that will preserve their quality and fitness for the Work. Aggregates shall be transported from storage to the project in vehicles constructed to prevent loss or segregation of materials.

C. Admixtures

Admixtures shall be stored and handled so that contamination and deterioration will be prevented. Liquid admixtures shall be thoroughly agitated before use. Admixtures that are frozen or partially frozen shall not be used.

D. Latex Modifier

Latex modifier shall be kept in enclosures that will protect it from exposure to temperatures below 40° F or above 85° F. Containers of latex modifier shall be protected from direct sunlight.

4.5. PRECAST CONCRETE

Precast units may be shipped after reaching 85 % of the design strength as determined by control cylinders tested in accordance with the requirements of VDOT *Road and Bridge Specifications* Section 302. However, units shall retain their structural integrity during shipment and shall be subject to inspection at the job site. Approval to use precast units shall not be construed as waiving the size and weight hauling limitations of VDOT.

4.6. REINFORCING STEEL

- A. The Contractor shall use all means necessary to protect materials of this Section before, after and during installation and to protect installed work and materials of other trades.
- B. Reinforcing steel shall be delivered to the job site bundled, tagged, and marked. Metal tags shall be used indicating bar size, lengths, and other information corresponding to markings shown in the Contract Documents and/or Shop Drawings.
- C. Reinforcing steel shall be stored on platforms, skids, or other supports that will keep the steel above ground, well drained, and protected against deformation. When placed in the work, steel reinforcement shall be free from dirt, paint, oil, or other foreign substances. Steel reinforcement with rust or mill scale will be permitted provided samples wire brushed by hand conform to the requirements for weight and height of deformation.

4.7. PIPE

- A. The Contractor shall use all means necessary to protect pipe materials, fittings, valves and

products before, during, and after installation. Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe, pipe linings and pipe coatings. The Contractor shall comply with AWWA C600 (Ductile Iron), AWWA M55 (HDPE), and AWWAC605 (PVC); and, the referenced AWWA Standards for shipping, handling and storage procedures. Any damage to linings or coatings discovered during the examination shall be repaired in accordance with the manufacturer's recommendations to the satisfaction of the Owner, before proceeding with the Work.

- B. Material and products shall be loaded, transported, and unloaded in accordance with the recommendations of the manufacturer and product Supplier. Pipe shall be transported to the job site on padded bunks or oak timbers and secured with nylon tie down straps to adequately protect the pipe and coating. Slings, hooks, pipe tongs, or other devices acceptable to the Engineer shall be used in pipe handling. No uncushioned ropes, chairs, wedges, cables or levers shall be used in handling finished pipe, fittings or couplings. Under no circumstances shall the pipe or fittings be dropped or skidded against each other. Padded wooden pipe cradles, or chocks suitable for the protection of coatings shall be used between finished pipes and beneath them when pipes are placed upon rough surfaces.
- C. Materials shall be stored so as to assure the preservation of quality and fitness for the Work. Materials, if stored, shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt, corrosion or foreign matter at all times.
- D. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, or other method approved by the Owner. Stacking shall conform to manufacturer's recommendations and/or AWWA C600 (Ductile Iron, AWWA M55 (HDPE), and AWWAC605 (PVC)).
- E. Lined and/or coated pipe shall be suitably protected from exposure and heating of the sun at all times following procedures recommended by the coating/lining system manufacturer. Exposure will not be allowed (except for short periods such as installation, assembly and repairs). It shall be the responsibility of the Contractor to prevent damage to the linings and coatings that might be caused by handling and/or onsite storage of the finished pipe at low temperatures (due to embrittlement), high temperatures or direct sunlight.
- F. No metal tools or heavy objects shall be permitted to come in contact unnecessarily with the finished coating
- G. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.
- H. All damaged pipe and fittings shall be removed from the site by the Contractor when directed to do so by the Owner.

4.8. PLANTING

- A. Plants
 - 1. The Contractor shall notify the Owner at least 48 hours in advance of the anticipated delivery date for plants. A legible copy of the invoice showing the kinds and sizes of plants in each shipment shall be furnished the Owner. A copy of the current Certificate of Nursery Inspection shall accompany each shipment of plants.

2. Representative samples of each shipment of plants shall be legibly labeled as to the genus, species, size, and quantity of the plants. When plants are in bales, bundles, boxes, or other containers, a legible label indicating the genus, species, size, and quantity of the plants shall be attached to each container.
3. Digging of plants for shipment shall be done in a manner that will avoid damage to or loss of roots, but roots that are cut, shall be cleanly cut. Balled and burlapped plants shall be properly dug and protected to preserve the natural earth in contact with the roots. Manufactured balls will not be accepted. Balls shall be firmly wrapped and tied with approved materials. Balled plants will not be accepted if the ball is broken, cracked, or loose. After plants are dug, their roots shall be protected from damage. Roots of bare root plants shall be kept moist at all times. Bare root plants shall be further protected by wrapping in wet straw, moss, burlap, or other suitable material.
4. In lieu of using burlap with balled plants, plants may be dug as specified herein and placed in plantable pots. Pots shall be constructed of material that will readily decompose in soil and shall not be smaller in any dimension than the size specified for balled and burlapped root systems. At the time of planting, the lip or rim of pots shall be broken away, and drainage holes shall be provided as directed. Plants with balls that have been grown in pots or with loose stems will be rejected.
5. Plants transported to the project in open vehicles shall be covered with suitable covers securely fastened to the body of the vehicle. Closed vehicles shall be adequately ventilated to prevent overheating plants. Plants shall be kept moist, fresh, and protected at all times.
6. When plants are to be stored, they shall be stored at a location approved by the Owner. Plants stored for more than 30 days shall not be used unless they are approved by the Owner. Unless other methods of storage are approved by the Owner, bare-root plants that are not planted within 24 hours after delivery shall be heeled-in in a moist trench dug in the ground. Bundles shall be opened, and plants shall be separated and placed singly in the trench with the roots spread in a natural position. Roots of each layer of plants shall be immediately covered in a manner satisfactory to the Owner with moist, pulverized soil; moist sawdust; or other approved material. Root-covering materials shall be kept moist at all times. Shade shall be provided as directed by the Owner. At the discretion of the Owner, balled material, container-grown material, and plants in plantable pots that are not planted within 48 hours of delivery shall have their root zone protected by wet sawdust or other approved material. Rejected plants shall be removed from the storage area within 24 hours of rejection; or, with the approval of the Owner, may be marked with yellow paint or otherwise made readily identifiable. If rejected plants have not been removed or acceptably marked within 24 hours, the use of plants from the storage area will not be allowed until rejected plants have been removed or identified.

4.9 SEEDING

Kinds and varieties of seeds shall be delivered to the project in separate bags and shall be mixed under the observation of the Owner on the project site or at other approved locations. The tag from each bag of seed shall be signed by the Contractor and delivered to the Owner after each bag is completely used.

4.10. SODDING

Sod shall be delivered to the project and stored in accordance with the Supplier's recommendations.

4.11. FERTILIZER

Fertilizer shall be delivered to the project in bags or other convenient containers, each fully labeled, and shall conform to the applicable state and federal regulations. Fertilizer shall be stored in accordance with the Supplier's recommendations. Fertilizer shall be uniform in composition, free flowing, and suitable for application with approved equipment.

4.12. LIME

Lime shall be delivered to the project in bags or other convenient containers, each fully labeled, and shall conform to the applicable state and federal regulations. Lime shall be stored in accordance with the Supplier's recommendations. Lime shall be agricultural grade ground limestone. Agricultural grade pulverized limestone may be substituted at no additional cost to the Owner.

4.13. GEOSYNTHETICS

Geotextile fabric shall be protected from mud, dirt, dust, sunlight, and debris during transport and storage. Material shall be inert to commonly encountered chemicals; resistant to mildew, rot, insects, and rodents; and biologically and thermally stable. Geotextile fabric for subsurface installation shall not be exposed to direct sunlight for more than 24 hours during installation.

4.14. PAVERS

A. Delivery

1. Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.
2. Pavers shall be delivered to the project site on pallets constructed with non-staining and non-discoloring materials.
3. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
4. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
5. Unload pavers at job site in such a manner that no damage occurs to the product.

B. Storage and Protection

1. Store materials protected such that they are kept free from mud, dirt, and other foreign materials.
2. Store concrete paver cleaners and sealers per manufacturer's instructions.
3. Cover bedding sand and joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.