SECTION 02200 - SITE CONSTRUCTION FOR PUMP STATIONS

PART 1 GENERAL

1.1 REFERENCES

1. General: The work shall comply with the most recent standards or tentative standards as published at the date of the contract and as listed in this specification using the abbreviation shown.

2. American National Standards Institute (ANSI)/American Concrete Institute (ACI):

1)	301	Specifications for Structural Concrete
2)	303R	Guide to Cast-in-Place Architectural Concrete Practice
3)	304.2R	Placing Concrete by Pumping Methods
4)	306R	Standard Specification for Cold Weather Concreting
5)	315	Details and Detailing of Concrete Reinforcement
6)	318	Building Code Requirements for Structural Concrete (ACI 318-99) and Commentary (ACI 318R-99)
7)	350R	Environmental Engineering Concrete Structures

3. Virginia Department of Transportation Road and Bridge Specifications (VDOT):

1)	208	Subbase and Aggregate Base Material
2)	211	Asphalt Concrete
3)	305	Subgrade and Shoulders
4)	308	Subbase Course
5)	309	Aggregate Base Course
6)	310	Tack Coat
7)	311	Prime Coat
8)	312	Seal Coat
9)	314	Penetration Surface Courses
10)	315	Asphalt Concrete Pavement

4. American Society for Testing and Materials (ASTM):

1)	A 185	Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete

2)	A 615	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3)	C 29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
4)	C 33	Specification for Concrete Aggregates
5)	C 94	Standard Specification for Ready-Mixed Concrete
6)	C 150	Standard Specification for Portland Cement
7)	D 1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

5. Concrete Reinforcing Steel Institute (CRSI):

   1) Manual of Standard Practices

1.2 QUALITY ASSURANCE

1. Asphalt: The VDOT Standards and Specifications shall define temperature restrictions, application procedures, mix components, and material references. All materials and application procedures shall be in accordance with VDOT Standards and Specifications.

2. Cast-in Place Concrete: Cast-in-place concrete shall comply with the Building Code Requirements for Structural Concrete (ANSI/ACI 318) and all applicable requirements of the Specifications for Structural Concrete (ANSI/ACI 301).

3. Testing: The Geotechnical Engineer shall observe the following to determine if the work has been performed in accordance with these specifications:

   1) Subgrade prior to placing base stone.

   2) Base stone prior to laying asphalt.

   3) Surface course application.

   It is the Contractor's responsibility to coordinate inspections with the Geotechnical Engineer.

1.3 SUBMITTALS

1. Concrete Mix Designs:

   1) Prior to proceeding with any concrete work, secure concrete mix designs from the concrete supplier, and submit to the Authority's Representative for review and approval.

   2) Distribute approved mix designs to testing laboratory, batch plant, job site, and governmental agencies having jurisdiction.

1.4 MAINTENANCE

1. Streets: The CONTRACTOR shall maintain and repair existing streets as necessary during the construction period and provide for additional applications of compacted #21B stone after completion of trenching and prior to paving, as required.

1.5 DEFINITIONS

1. Clearing: Clearing shall consist of the the satisfactory disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, and rubbish occurring in the areas to be cleared.

2. Grubbing: Grubbing shall consist of the removal and disposal of brush, stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

1.6 EROSION AND SEDIMENT CONTROL

1. General: Erosion and Sediment control is the sole responsibility of the Contractor/Developer. No site requiring additional Erosion and Sediment Control work will be accepted by the Authority.

PART 2 PRODUCTS

2.1 ACCESS ROAD AND PARKING SURFACE TREATMENT

1. General: Gravel roads, access drives, parking areas, or other gravel surfaces shall consist of a minimum of 6 inches of compacted VDOT #21A aggregate unless shown otherwise on the plans.

2. Subgrade: Subgrade shall conform to VDOT Specification 305.

3. Asphalt Surface Treatment: Asphalt surface treatment, where required, shall comply with VDOT Specification 314. Joints in existing pavement shall be overlapped and sealed

4. Prime and Surface: Where required,pavement shall consist of a prime coat and two surface coats as follows:

Prime Coat		
CRS-2	Liquid Asphalt	0.30 Gal/S.Y.
VDOT #8	Cover Stone	25 lbs./S.Y.
Seal Coats (each)		
CRS-2	Liquid Asphalt	0.30 Gal/S.Y.
VDOT #8	Cover Stone	25 lbs./S.Y.

5. Asphalt Drive and Parking Areas:

   1) Aggregate base course shall consist of VDOT #21A aggregate base material and shall conform to VDOT Specification 208.

   2) Prime coat shall consist of liquid asphalt material meeting the requirements of VDOT Specification 311.

   3) Bituminous concrete base course shall consist of bituminous concrete base material Type IM-19.0 and conform to VDOT Specification 315.

6. Asphalt Surface Course and Pavement Overlay:

1) Tack coat shall consist of liquid asphalt material meeting the requirements of VDOT Specification 310.

2) Bituminous concrete surface course or overlay shall consist of bituminous concrete surface material Type SM-2A and shall conform to VDOT Specification 211.

7. Asphalt Paving Limitations:

1) Apply prime and tack coats when ambient temperature is above 50 degrees F. (10 degrees C) and when temperature has not been below 35 degrees F. (1 degree C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

2) Construct asphalt concrete base and surface course only when atmospheric temperature is above 40 degrees F. (4 degrees C) and when base is dry. Aggregate base course may be placed when air temperature is above 30 degrees F.

2.2 CONCRETE

1. General: Concrete work shall conform to all requirements of ACI 301 and ACI 350R, except as modified by supplemental requirements below. The CONRACTOR shall provide at the construction site all ACI specifications referenced herein.

2. Strength: Concrete shall have a minimum allowable compressive strength specified at 28 days (ACI 301, 3.2). Concrete shall reach a minimum of 80 percent of this design strength before weight supporting forms may be removed (ACI 301, 4.5.5). Earlier removal of non load bearing forms shall be permitted only if approved by the Authority's Representative.

3. Materials and Testing: Contractor shall comply with the following as minimums:

1) Portland cement: 4,000 psi ASTM C 150, Type I or II.Low alkali cement shall be used where aggregates are alkali reactive.

2) Aggregate, shall meet requirements of ASTM C 33 and be uniformly graded and clean. Aggregate shall be tested in accordance with ASTM C 29. Do not use aggregate known to cause excessive shrinkage.

3) Aggregate, coarse: Crushed rock or washed gravel with minimum size between 3/4 inch and 1-1/2 inch, and with a maximum size Number 4.

4) Aggregate, fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8 inch screen, of which at least 12 percent shall pass a 50 mesh screen.

5) Provide concrete with compressive strengths shown on the plans. When such strengths are not shown on the plans, concrete shall be a minimum of 4000 psi.

6) Slump Limits: Design mixes shall result in concrete slump at point of placement of not less than 2 inches and not more than 4 inches. If the approved mix design includes the use of admixtures which affect slump, slump at point of placement shall comply with mix design.

7) Water cement ratio for tank slab shall be maximum 0.45.

4. Reinforcement

1) General: Reinforcement materials and installation shall conform to the applicable sections of the latest version or revision of ACI 301, except as modified by the Supplemental Requirements listed below.

2) Strength: Reinforcement shall be of the size shown on the plans with all bars being billet steel, ASTM A 615, Grade 60 unless noted otherwise. Welded wire fabric gauge and mesh size shall be as shown on the plans.

3) Spacing: The clear distance between parallel bars shall not be less than the nominal diameter of the bars, 1-1/3 times the maximum size of the coarse aggregate, not 1 inch. All main reinforcement shall be spaced not less than 2 inches from any concrete surface unless authorized or indicated on the plans. Clearance between ground and rebar shall be a minimum of 3 inches. For stirrups, spacer rods and similar secondary reinforcement, this clearance may be reduced by the diameter of such rods.

4) Splicing: Where splicing of bars is necessary, the minimum length of the splice shall be 30 diameters of the largest bar, unless shown to be otherwise on plans.

5) Hooks and Bends: When a hook is indicated on the plans, it shall mean either a 180 degree turn plus an extension of at least 4 bar diameters, or a 90 degree turn plus an extension of at least 6 bar diameters.

6) Quality Assurance: Comply with the following as minimums:

    1) Bars: ASTM A 615, grade 60 unless otherwise shown on the plans using deformed bars for number 3 and larger.

    2) Welded wire fabric: ASTM A 185.

    3) Bending of rebar shall be in accordance with ACI 318.

    4) Supports for reinforcement: Supports for reinforcing bars and welded wire fabric shall comply with CRSI recommendations, including bolsters, chairs and spacers. Wire bar supports shall be rust protected in accordance with CRSI Class 2. Under no circumstances will rebar or other metal pins driven into the ground to support reinforcing steel be allowed.

    5) Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI "Manual of Standard Practices" and ACI 315.

    6) Reinforcement: Do not use reinforcement having any of the following defects:

        a) Bar lengths, depths, or bends exceeding the specified fabricating tolerances.

        b) Bends or kinks not indicated on the plans or required for this work.

        c) Bars with cross-section reduced due to excessive rust or other causes.

7) Contractor shall fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI “Manual of Standard Practices”.

5. Waterstops: Waterstops shall be neoprene and of sufficient size to insure proper anchorage into both adjacent pours.

6. Joint Filler: Joint filler shall be a premolded expansion joint filler complying with ASTM D 1751.

7. Pipe Sleeves: Pipe sleeves shall be cast iron or PVC in accordance with Section 02080 - Utility Pipe and Materials. Sleeves shall be two piece for assembly around existing pipes or sleeves may be cut and reassembled around existing pipes. Sleeve size shall be adequate to install sleeve seal.

8. Sleeve Seals: Sleeve to pipe seals shall be synthetic rubber compression type seals similar to Link-Seal manufactured by Thunderline Corporation.

9. Portland Cement Concrete Limitations:

   1) All concrete work shall be protected from damage or reduced strength which could be caused by precipitation, freezing action, or low temperatures. All work with concrete when air temperature is below 40 degrees F shall comply with Standard Specification for Cold Weather Concreting ANSI/ACI 306R and as specified herein.

   2) Do not use antifreeze agents or chemical accelerators, unless written approval for such use has been given by the Geotechnical Engineer.

   3) Do not use aggregates that contain ice or snow. Do not place concrete on frozen soils or subgrade.

   4) If air temperatures have fallen below 40 degrees F, or are expected to fall below 40 degrees F within twenty-four hours, heat water and all aggregates before mixing. Concrete mixture temperature at point of placement shall not be less than 60 degrees F nor more than 80 degrees F.

2.3 SEEDING

1. Delivery: All seed shall be kept cool, dry and free of contaminants during transportation. Seed and soil amendments shall be delivered in original, unopened containers with appropriate labels attached.

2. Storage: Seed which is not sown within 24 hours after delivery shall be stored as follows, unless other methods of storage are requested by the Contractor and approved by the Authority's Representative.

   1) Seed storage location shall be cool, dry, and sheltered from wind, traffic and construction activities.

   2) Fertilizers, lime, herbicides, insecticides, and other agricultural chemicals shall be stored separately from the seed.

3. Grass seed: Seed shall comply with all applicable state and federal seed laws and contract requirements. Seed shall comply with all pertinent provisions of VESCH and VDOT 244.

   1) Grass seed shall consist of pure, live, certified grass seed mixture, of the latest crop, and containing weed seed less than 0.5 percent by weight of the total mixture.

4. Fertilizer: Fertilizer shall be commercially-prepared and granular. Fertilizer shall be uniform in composition, dry, and free-flowing.

   1) Fertilizer must comply with pertinent provisions of VESCH and VDOT 244. Fertilizer shall conform to all applicable state and federal regulations.

5. Mulch: Oat or wheat straw shall be used. Straw shall be dry and free from weeds, weed seeds, and foreign matter detrimental to plant life. Mulch shall conform to VDOT 244.

6. Straw blanket: Straw blanket shall consist of a 100 percent straw blanket sewn into a lightweight photodegradable net. The straw blanket shall be designed for installation on 3:1 and steeper slopes. Weight of blanket shall be approximately 0.5 pounds per square yard. Straw blankets shall be used in areas indicated on plans.

7. Paper matting: Paper matting shall consist of a flexible knitted construction of high strength degradable yarn interwoven with strips of biodegradable paper. Weight of matting shall be approximately 0.2 pounds per square yard.

8. Water: Water shall be potable or clean water free of contaminants harmful to plant growth. Brackish water shall not be used.

9. Lime: Unless otherwise noted, lime shall be agricultural ground or pulverized limestone.

10. Warranty Maintenance: Contractor shall provide, during the warranty period, maintenance as necessary to establish a healthy uniform stand of turf. Contractor's maintenance shall generally include overseeding, application of amendments, and repair of erosion as necessary.

PART 3 EXECUTION

3.1 SITE WORK

1. Clearing: An acceptable site shall have all trees, stumps, roots, brush, and other vegetation in areas to be cleared cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated on the plans to be left standing. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require. A healthy stand of grass shall be provided on all cleared areas of the site.

2. Grubbing: Material to be grubbed, together with logs and other organic debris not suitable for foundation purposes, shall be removed to a depth of not less than 12 inches below the original ground in areas such as proposed buildings, grassed areas, and areas to be paved. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the adjacent surfaces.

3. Disposal of Materials : All disposal of debris and unsuitable or surplus material is the sole responsibility of the Contractor. All excess materials must be removed from the site prior to acceptance by the Authority.

4. Drainage: The Contractor/Developer shall be responsible for providing proper stormwater drainage for the site .

3.2 ACCESS ROAD AND PARKING SURFACE TREATMENT

1. General. Asphalt concrete pavement construction shall be in accordance with the details on the plans and construction shall be in accordance with VDOT Specification 315.

2. Subgrade: Uniformly smooth grade excavated areas, filled sections and adjacent transition areas. Subgrade shall be rolled and compacted prior to stone application.

3. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

4. Barricades: Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

5. Surface Drainage: The surface of all paving work shall slope and drain surface water toward catch basins or swales. If water stands, paving shall be corrected to prevent standing water, subject to the Authority's Representative's approval.

6. Remedial Work: Repair or replace deficient work as directed by the Authority's Representative at no cost to the Authority.

3.3 CONCRETE

1. General: A subbase of 6 inches of VDOT #57 stone shall be placed under all slabs, unless otherwise indicated on the plans.

2. Reinforcing: Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.

    1) Clean reinforcement and remove loose dust and mill scale, earth, and other materials which reduce bond or destroy bond with concrete.

    2) Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations.

    3) Place reinforcement to obtain the required coverages for concrete protection as specified by ACI 301.

    4) Install welded wire fabric in as long lengths as practicable, lapping adjoining pieces one full mesh minimum.

    5) Dowels shall match reinforcement with which they lap unless noted.

    6) Unless otherwise shown on the plans, or required by governmental agencies having jurisdiction, or mechanical lap type splices are used, overlap bars per paragraph 2.2.4 (splicing) of this specification. Mechanical lap devices shall be approved by the Authority's Representative prior to use.

    7) Do not field bend reinforcement without written permission of the Authority's Representative. In no case may bars be heated to facilitate bending.

    8) Welding, oxy-acetylene torch cutting , or the application of heat to reinforcing steel, anchor bolts, or any metal object embedded in concrete is strictly forbidden unless approved in writing by the Authority's Representative.

3. Embedded Items:

    1) Do not embed conduit or piping in structural concrete.

    2) Set bolts, post bases, inserts, and other required items in the concrete, accurately secured so they will not be displaced, and in the precise locations needed.

4. Pipe Sleeves: Provide pipe sleeves for all existing and new pipes penetrating the wall. Sleeves shall be installed flush with the outside surfaces of the wall. Pipes shall be sealed within the sleeves by a compression type pipe penetration seal similar to "Link-Seal" manufactured by Thunderline Corporation of Belleville, MI.

5. Footing: Footing depth and construction shall be as shown on the plans. Bottoms of all exterior footings shall be adequately drained before foundation concrete is placed.

6. Insulation: Insulation shall be placed at the locations as shown on the plans.

7. Mixing Concrete:

    1) Transit mix the concrete in accordance with provisions of ASTM C 94.

    2) Mixing Water:

A maximum of 2-1/2 gallons of water per cubic yard of concrete, may be withheld at the batch plant.

Upon arrival at the job site, add all or part of the withheld water (as required for proper slump) before the concrete is discharged from the mixer.

Mix not less than five minutes after the withheld water has been added, and not less than one minute of that time immediately prior to discharge of the batch.

Unless otherwise directed, provide at least 15 minutes total mixing time per batch after first addition of water.

3) Do not use concrete that has stood for over 30 minutes after leaving the mixer, or concrete that is not placed within 60 minutes after water is first introduced into the mix. Plasticizers or other admixtures shall not be used unless prior approval from the Authority's Representative has been obtained.

8. Placing Concrete:

1) Remove foreign matter accumulated in the forms.

2) Rigidly close openings left in the formwork.

3) Wet wood forms sufficiently to tighten up cracks. Wet other material sufficiently to maintain workability of the concrete.

4) Use only clean tools.

5) Masonry wall shall be sufficiently wet to maintain workability of the concrete.

9. Conveying:

1) Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.

2) Deposit concrete as nearly as practicable in its final location so as to avoid separation due to rehandling and flowing.

3) Do not use concrete which becomes non-plastic and unworkable, does not meet required quality control limits, or has been contaminated by foreign materials.

4) Remove rejected concrete from the job site.

10. Placing Concrete in Forms:

1) Deposit concrete in horizontal layers not deeper than 24 inches and avoid inclined construction joints.

2) Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.

11. Placing Concrete for Walls : Concrete shall be deposited and consolidated in horizontal layers not deeper than 24 inches in a continuous operation. Placing shall be carried on at such rate that the concrete which is being integrated with fresh concrete is still plastic. Temporary spreaders in forms shall be removed when concrete has reached the elevation of the spreaders.

12. Placing Concrete Slabs:

1) Deposit and consolidate concrete slabs in a continuous operation.

2) Bring slab surfaces to the correct level with a straightedge, and then strike off.

3) Use bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.

4) Do not sprinkle water on the plastic surface. Do not disturb the slab surface prior to start of finishing operations.

13. Cold Weather Placement:

1) All concrete work shall be protected from damage or reduced strength which could be caused by freezing actions or low temperatures. All work with concrete mixture when air temperature is below 40 degrees F shall comply with ACI 306R and as specified herein.

2) Do not use antifreeze agents or chemical accelerators, unless written approval for such use has been given by the Authority's Representative.

3) Do not use aggregates that contain ice or snow. Do not place concrete over frozen soils or subgrade.

4) If air temperatures have fallen below 40 degrees F, or are expected to fall below 40 degrees F within twenty-four hours, heat water and all aggregates before mixing. Concrete mixture temperature at point of placement shall not be less than 60 degrees F nor more than 80 degrees F.

14. Consolidation:

1) Consolidate each layer of concrete immediately after placing, by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.

2) Do not vibrate forms or reinforcement.

3) Do not use vibrators to transport concrete inside the forms.

15. Curing: Concrete curing shall be done with accordance with ACI 303R. Cold weather curing shall be in accordance with ACI 306R.

16. Expansion Joints: Expansion joints are to be provided at locations shown on the plans or at other locations during construction as approved by the Authority's Representative. Joints shall be filled with a premolded expansion joint filler complying with ASTM D 1751.

17. Construction Joints: Construction joints shall be provided as shown on the plans or as preapproved by the Authority's Representative. Joints shall be kept free of form oil or other materials which may hamper bonding. Soiled surfaces shall be washed, mechanically cleaned or brushed blasted to the satisfaction of the Authority's Representative. A surface bonding agent similar to Larsen Products "Weld Crete" shall be applied at all joints in accordance with the manufacturer's recommendation.

1) Do not use construction joints except as shown on the plans.

2) If additional construction joints are found to be required, secure the Authority's Representative's approval of joint design and location prior to start of concrete placement.

18. Waterstops: Waterstops shall be installed at all joints shown and all construction joints used by the Contractor in placing the concrete. Waterstops shall be anchored securely in place by using split forms, tie wires, or other methods that will insure correct positioning and proper embedment of the waterstop while the

concrete is being placed. Concrete shall be thoroughly vibrated around the waterstop to avoid honey combing and insure proper bonding to the waterstop.

19. Finishing: All exposed concrete surfaces shall receive as a minimum, a smooth rubbed or grout cleaned finish conforming to ACI 301. Alternative methods of finishing concrete, such as an application of a concrete finish/sealer such as Thoroseal or similar product, shall be acceptable if approved by the Authority's Representative. Except as may be shown otherwise on the plans provide the following finishes at the indicated locations.

    1) Float Finish: apply to footings

    2) Trowel Finish: apply to bond beams and other surfaces that are to be exposed to view, unless otherwise shown

    3) Non-slip Broom Finish: apply to walks

20. Slabs: Concrete slabs shall be finished in accordance with ACI 301. 11 with floors receiving a trowled finish and exterior slabs to receive a broom finish.

21. Testing: An independent testing agency shall be designated by the Contractor and approved by the Authority's Representative prior to the preconstruction conference. Services so designated to be performed by the testing agency in ACI 301 shall be paid for by the Contractor. The Contractor shall provide the qualifications of proposed materials and mix designs as well as other testing services specifically required of the Contractor. Testing services to be provided by the Contractor shall include the following:

    1) Additional testing and inspection required because of changes in materials or proportions requested by the Contractor.

    2) Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements.

    3) The Contractor shall provide the materials, tools and labor necessary to prepare the test specimens and deliver them to the testing agency. The Contractor's Laboratory Technician shall conduct the slump test and the compressive strength testing of cylinders.

    4) The Contractor shall provide test results verifying that the concrete meets the strength requirements of these Specifications.

22. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

    1) Testing Frequency: Obtain at least one composite sample for each 100 cu. Yd. Or fraction thereof of each concrete mix placed each day.

    When frequency of testing will provide a fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

    2) Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.

    3) Air Content: ASTM C 231, pressure method for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

4) Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

5) Compression Test specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

6) Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days. Test two field-cured specimens at 7 days and two at 28 days. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

23. Concrete Strength: Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

3.4 SEEDING

1. Preparation: Rake the soil surface to remove all root clumps, stones, and debris 1 inch or greater in size. True up all depressions and edges. Soil in the area to be seeded shall be prepared in accordance with VESCH and VDOT 602 and 603.

2. Application: Seeding shall conform with VESCH 3.31 or VESCH 3.32, and VDOT 603. Initial seeding shall consist of uniformly applying seed, mulch, and water on prepared areas. Over-seeding shall consist of applying seed, mulch, and water to areas previously seeded.

3. Grading: Establish a smooth grade ready to receive seed. Finish grade must conform to the grades and elevations as shown on the plans.

4. Topsoil: Topsoil shall be in place for all areas to be permanently seeded.

END OF SECTION