

## **DETAILED SPECIFICATIONS**

### **SECTION 02480**

#### **LANDSCAPING**

##### **PART 1 - GENERAL**

###### **1.01 - Intent**

- A. This section covers the work necessary for finish grading, seeding, sodding, and planting.
- B. Reference to any of the following sections are only for clarity of reading and reference and shall not be taken as a complete description of the work. Related work as specified elsewhere is as follows:
  - 1. Section 01010 - General
  - 2. Section 02200 - Earthwork
  - 3. Section 03300 - Cast-in-Place Concrete
- C. The Contractor shall perform all work as indicated herein unless otherwise noted, and any additional work to produce a completely finished job.

###### **1.02 – Submittals**

- A. Submit the following certifications:
  - 1. That the inspection of plant materials made by applicable authority are approved, and materials are free from hazardous insects and disease.
  - 2. That materials are free from quarantine restrictions by regulatory authorities.
  - 3. That materials equal or exceed specified standards including seed, sod, fertilizer, mulch, erosion fabric, or other mulch stabilizer.
- B. Submit written directions for care and maintenance of materials through their full growing season.

###### **1.03 – Reference Standards**

- A. Unless otherwise noted, conform to INDOT Standard Specifications, Section 621, and Hamilton County Soil and Water Conservation District Erosion Control Specifications. In case of conflict between the reference specifications and the specifications shown or included herein, follow the more stringent requirements.

###### **1.04 - Handling and Storage**

- A. The Contractor shall deliver seed, mulch material, sod, and plantings immediately prior to laying. Keep sod damp.
- B. Care shall be taken to retain the native soil on the roots during the process of stripping, transporting, and placing sod. Sod shall be cut and transported only when moisture conditions are favorable for correct handling and shall be protected by a suitable canvas or other wind resistant material during transit. Dumping of sod from vehicles on the areas of delivery will not be permitted. Sod which has been damaged in transit or in handling, including drying out, shall be rejected and removed from the site immediately.
- B. The Contractor shall deliver fertilizer in manufacturer's packages and store clear of the ground in a weatherproof storage place in such a manner that they will be kept dry and their effectiveness will not be impaired.

#### 1.05 - Timing

- A. Notify the Engineer of the proposed starting dates for the work.
- B. Planting seasons shall be in accordance with the following dates. Only upon written approval of the Engineer may planting begin earlier or continue later than the specified dates.
  - 1. Seeding: Spring, from March 1 to May 15; Fall, from August 15 to October 15.
  - 2. Sodding: From as soon as the ground can be worked in the Spring to September 30.

#### 1.06 - Additional Topsoil

- A. The Contractor shall use existing topsoil stockpiled on site and provide enough other topsoil to complete the work. The Contractor shall calculate the required additional amount and provide accordingly.

#### 1.07 - Areas Included

- A. The Contractor shall sod or seed and mulch areas within the limits of the site including flat areas and earth banks. Make good all areas disturbed within and/or beyond the limits of the site work to the Engineer's satisfaction. Areas to be sodded or seeded are shown on the Contract Drawings. A strict maintenance program as described in these specifications will be enforced. Trees and shrubs shall be provided as shown on the Contract Drawings.

#### 1.08 - Protection of Existing Trees and Shrubs

- A. The Contractor shall protect all trees and other plantings likely to be disturbed by the work.
- B. Do not cut any tree or other planting without the prior approval of the Engineer.
- C. Pruning of branches and removal shall be carried out by an approved Contractor in this class of work.
- D. The Contractor shall prune and ball or otherwise protect all roots exposed.

#### 1.09 - Maintenance

- A. The Contractor shall maintain seeded or sodded areas and plantings until well established as determined by the Engineer.
- B. Maintenance is to include regular watering, protection, restaking, refilling of eroded areas, and resodding.

#### 1.10 - Weather and Seasonal Conditions

- A. Work under this specification is to proceed only in calm weather and on ground free of frost, snow, ice or standing water and when in the opinion of the Engineer, weather and seasonal conditions are suitable.
- B. The Engineer will not permit the work to proceed when wind conditions are such that material would be carried beyond the areas designated for the work, or that the material would not be applied uniformly.
- C. The Contractor shall notify the Engineer in writing, giving seven days notice of intention to start the work.
- D. Work shall not start without approval of the Engineer.

#### 1.11 - Protection

- A. The Contractor shall take care to prevent the contamination by operations and works such as structures, signs, guide rails, fences, utilities, etc., and where such contamination occurs, remove it to the satisfaction of, and by means approved by the Engineer.
- B. The Contractor shall take whatever precautions may be necessary and ensure that fertilizer in solution does not come in contact with the foliage of any trees, shrubs or other susceptible vegetation. Upon failure to meet this requirement immediately

spray the affected vegetation with water as required by the Engineer to remove such contamination.

- C. The Contractor shall repair mechanical damage to trees by trimming and painting or replacement, as determined by the Engineer.

## PART 2 - PRODUCTS

### 2.01 - Topsoil

- A. The Contractor shall provide an approved topsoil from stockpile on site or imported friable natural loam material consisting of sand, clay and humus and free from stones, weeds or other deleterious matter, capable of sustaining vigorous plant growth.
- B. Attention is drawn to the need for thorough stone and weed picking from topsoil supplied from all various sources.
- C. Topsoil containing stones in excess of 5 percent by volume not passing a 2" sieve will not be permitted.
- D. Topsoil shall have a pH value of 6.2 to 7.4. Testing of pH value shall be in accordance with the procedure set out in the Purdue University Agricultural Experiment Station bulletin No. 635 or in a qualified laboratory using a 1:1 Soil-Water Suspension. If necessary, the Contractor may add agricultural limestone to topsoil in order to raise the pH to the specified requirements. Topsoil shall not be incorporated into the work until it is approved

### 2.02 - Grass Seed

- A. The Contractor shall obtain seed from a recognized seed house, labeled under the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act. Seed shall be purchased from sources of supply that have been sampled, tested and reported by the State Seed Commission, Purdue University, West Lafayette, Indiana.
- B. The certified seed shall consist of the following grasses by weight and delivered in bags bearing tags showing the mix quantities as follows:

- 1. For flat areas at less than 3:1 slope, outside of drainage ditches or other wet areas:

58% Fiesta Rye Grass  
21% Kentucky Blue  
15% Creeping Red Fescue  
6% Miscellaneous  
Sowing Rate @ 200 lbs / acre

2. For areas  $\geq$  3:1 slope or ditches as approved:

Use same mixture as specified for Type 1 above, but add 10 lbs per acre of crown vetch separately, placed with an approved spreader just prior to placing the specified in accordance with INDOT Specification Section 621, Article 621.06.d, Seed Mixture CV.

#### 2.03 - Grass Mulching Material

- A. All seeded areas shall receive mulching material applied uniformly at a rate of 2 tons per acre. Mulch material shall be non-toxic to vegetation and to germination of seed, consisting of straw or wood cellulose fibers, free from weeds and all foreign matters. All mulching material is to be dry and on being processed either through a conventional mulch blower or a hydroseeder, will form an evenly distributed mat.

1. Straw - The material shall be of seed-free stalks of oat, wheat, rye or other approved material, which has been air-dried.
2. Wood Cellulose or other approved Fibers – material shall not be water soluble and shall comply with the following properties:

Moisture content. Percent, maximum:	15.0
Organic matter wood fiber (oven dried Basis), percent, minimum:	95.0
pH Range:	4.3 to 8.5
Water holding capacity, grams of water per 100 grams wood fiber, min:	1,000

#### 2.04 - Sod

- A. The Contractor shall furnish sod that is No. 1 Nursery Grade 1" thick, fully root permeated in a close mat, uniform in texture, free from weeds, delivered damp without decay, complete with sod pegs (1" x 2" x 12" long, undressed stakes).
- B. Sod shall be obtained from a recognized sod nursery which shall furnish a certified copy of inspection as required by the State of Indiana, Department of Agriculture. Sod shall have been grown on a well-drained, fertile, sandy loam, (not peat). The sod shall not show a greater weed population than 0.5% by area.

#### 2.05 - Limestone

- A. Limestone shall be agricultural grade with a minimum total neutralizing power, calcium carbonate equivalent, of 80. Fineness, percent passing the No. 8 sieve, shall be no less than 80.

## 2.06 - Fertilizer

- A. The Contractor shall supply 12-12-12 chemical fertilizer in bags. Fertilizer shall be uniform in composition, free flowing and suitable for application with approved equipment. Tests will not be required, but fertilizer shall be from a recognized commercial supplier, meeting the rulings of the Indiana State Seed Commissioner.

## 2.07 - Water

- A. The Contractor shall supply water used for seed, sod and planting to be clean and free of any impurities which would inhibit germination, or otherwise adversely affect growth.

## 2.08 – Gabions (if shown or required)

- A. Wire shall conform to Federal Specifications QQ-W-461 H, Finish 5, Class 3 and ASTM A-641.
- B. The mesh shall be galvanized with the zinc coating being a minimum of 0.80 ounces per square foot. The netting wire shall be hexagonal with an opening of 3" by 4" and be 0.118" in diameter. The wire for selvages and corners shall be 0.150" and the wire for binding shall be 0.091".
- C. The stone shall vary in size from 4" to 8".

## PART 3 - EXECUTION

### 3.01 - Finish Grading

- A. The Contractor shall grade all areas carefully to suite the elevation on the drawings or as directed by the Engineer.
- B. The Contractor shall finish grade to 4" below required final elevations to allow for 4" topsoil. Roll and compact prior to topsoil application.

### 3.02 - Topsoil

- A. The Contractor shall place 4" thickness of topsoil on areas to be seeded or sodded.

### 3.03 - Sodding and Seeding

- A. Sodding - The Contractor shall sod the areas in a workmanlike manner utilizing the following construction practices:

1. The area to be sodded shall be smooth and uniform. Surfaces prepared for sod shall be of sufficient depth below unseated areas that newly laid sod shall be in accordance with the surrounding surface.
2. After the area has been prepared for sod, fertilizer shall be applied at the rate of 400 lb/acre. The surface shall be loosened to a depth of 1 to 2 inches and then raked before the sod is placed. All clods, lumps, boulders, or waste material shall be removed satisfactorily.
3. Sod strips shall be laid carefully by hand in the designated direction. The sod shall be fitted to the surrounding grade and fixed objects. The sod strips shall be butted together closely to avoid open joints. Overlapping of sod will not be permitted. After laying and initial weathering, the sod shall be tampered or rolled as directed to ensure contact with the soil underneath and shall be in accordance with the surrounding surface. After compaction, the sod shall present a smooth even surface free from lumps and depressions. On slopes of 3:1, or flatter, the use of broken sod strips will be permitted. Where broken pieces are laid, no overlaps will be allowed.
4. Sod placed in ditches with grades steeper than 1% and on slopes 3:1 and steeper shall be pegged. The pegs shall be spaced not over 2 feet apart in each strip measured lengthwise of the strip. Pegs shall be driven down until no more than 1 inch protrudes above the surface of the sod. Grades and slopes flatter than specified herein shall be pegged as directed.
5. Pegs shall be wood at least 0.5 inches by 0.075 inches by 12 inches. In lieu of pegs, T-shaped wire pins may be used. The pins shall be machine bent from 8 gage low carbon steel with a minimum of 8 inch leg, a 4 inch head, and a 1 inch secondary drive. Pins shall be driven flush with the top of the sod.
6. Sod shall be watered immediately after laying. The amount of watering shall be sufficient to saturate the sod and the upper few inches of the underlying soil. The sod shall be watered once everyday of the first week, once every second day of the second week, once every third day of the third week, and once a week thereafter. Sod shall be maintained for a minimum of four weeks from the time it is laid before being accepted. During periods of ample rainfall, watering may be modified to simulate the above schedule.
7. Sod placed during the months of June, July, and August shall be subject to the following conditions:
  - a. sod shall be in good, live, growing conditions; and
  - b. sod shall be placed within 36 hours after cutting and protected from damage during that period.

8. Winter sodding will be permitted when the temperature is above 35<sup>0</sup>F. No frozen sod shall be laid and no sod shall be laid on frozen soil. Sod shall be properly protected from drying out and shall be laid within 48 hours after cutting.
- B. Seeding - The Contractor shall seed the area in a workmanlike manner utilizing the following construction practices:
1. Cover areas to be seeded with 4 inches of topsoil fine graded. Apply lime and fertilizer as specified above. Seed and mulch using specified mixture at the prescribed rate.
  2. Apply the seed and fertilizer with an approved hydroseeder or seeder.
  3. Apply mulch material with an approved mulch blower with sufficiently dry straw or other approved material so that it can be processed without stoppage through the blower.
  4. Apply mulch evenly over the areas designated. The rate of application to result in a depth of not less than 1 inch or more than 2 inches, measured at the time of application.
  5. Mulching to follow seeding on the same day. However, where the condition of soil creates immediate danger of erosion, the Engineer may require mulching prior to seeding. No extra payment will be made for carrying out work in this order.
  6. Provide a means to retain the mulch material in place. The following methods or a combination thereof will be acceptable.
    - a. For flat areas at less than 3:1 slope: Indiana Department of Transportation Standard Specifications, Section 621, Article 621.05.c, Method A, commercially produced mulch binder, Terra-Mulch products as manufactured by Profile Products LLC, Buffalo Grove, Illinois, or approved equal.
    - b. For areas  $\geq$  3:1 slope or in ditches: Indiana Department of Transportation Standard Specifications, Section 621, Article 621.05, Method E, Excelsior Blankets, Paper Mat, or Straw Mat as approved

#### 3.04 - Fertilizer and Agricultural Limestone

- A. The Contractor shall apply fertilizer and/or agricultural limestone as specified in a workmanlike manner. They shall be spread uniformly over the area to be seeded and mixed into the top 2 inches of soil with a disc harrow, rotary tiller, or other approved

equipment. Fertilizer shall be spread at a rate of 800 lbs. per acre and agricultural limestone at the rate of 1000 lbs. per acre.

### 3.05 – Maintenance and Guarantee

- A. The Contractor shall keep seed and sod moist at all times until growth is sturdy, thick and well established and provide pumps and all necessary portable irrigation piping to distribute the necessary water.
- B. The Contractor shall provide regular watering and cutting for at least 60 days after the date of the last seed and sod placing, or until such time as a sturdy, thick growth is established.
- C. After all work on the entire Project is completed, the Contractor shall repair bare spots of seeded area or any sod which is not healthy or shows evidence of slipping or subsiding without additional cost to the Owner.
- D. If inspection during seeding operations, or after there is show of green, indicates that areas have been omitted, the Engineer will require the sowing of additional seed on these areas, at no additional cost to the Owner. When any portion of the surface becomes gullied or otherwise damaged following seeding, the affected portion shall be repaired to its original condition and graded and reseeded as specified.
- E. Upon completion of repairs or renewals necessary in the judgment of the Engineer at the time of inspection, the Engineer will certify in writing to the Owner as to the provisional acceptance of the work.
- F. Seeding and Sodding shall be guaranteed for a period of one year from the date of provisional acceptance. At the end of the guarantee period, the Engineer will inspect the work for final acceptance and if areas are found to be defective, repairs shall be completed as herein specified at no additional cost to the Owner. The Contractor will be responsible for repair of areas as a result of deficient installation or materials only, and will not be responsible for damage caused by property owners, subsequent work by others, extreme drought conditions, extensive flooding, or other conditions.

### 3.06 - Rip-Rap

- A. The Contractor shall place the revetment riprap with the geotextile underlayment in accordance with Section 616 of the current Indiana Department of Transportation Standard Specifications.

### 3.07 - Gravel Mulch (if shown or required)

- A. The Contractor shall first level the ground and then place the visqueen weed barrier. The gravel shall then be placed to a depth of two (2) inches.

3.08 – Gabions (if shown or required)

- A. The Contractor shall place gabions in accordance with the manufacturer's instructions. Minimum thickness shall be 18".

END OF SECTION