

CONSTRUCTION SPECIFICATIONS

INDEX

SECTION 02105 - MOBILIZATION, PERMANENT SEEDING

PART 1 - GENERAL

- 1.1 DESCRIPTION
- 1.2 QUALITY ASSURANCE
- 1.3 JOB CONDITIONS
- 1.4 SUBMITTALS

PART 2 - PRODUCTS

- 2.1 MATERIALS

PART 3 - EXECUTION

- 3.1 SURFACE CONDITIONS
- 3.2 PROTECTION
- 3.3 LAY-DOWN AREA
- 3.4 EXISTING FENCES
- 3.5 CLEAN-UP AND REPAIRS
- 3.6 MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included

Work under this SECTION covers requirements for materials, tools, equipment, and services necessary to complete the site preparation and site cleanup work for this project. The work shall include, but is not necessarily limited to, completion of the following work:

1. Mobilization.
2. Protection of existing utilities, fences, vegetation, and facilities to remain undisturbed.
3. Reestablishing any access to site to acceptable condition.
4. Demobilization.

1.2 QUALITY ASSURANCE

- A. Contractor shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this SECTION.
- B. In addition to complying with requirements of governmental agencies having jurisdiction, Contractor shall comply with the directives of Division and Division.
- C. Applicable Standard: Iowa State University (ISU) Extension Service Publication PM-909, "Preventing Construction Damage to Trees".
- D. Contractor shall comply with most guidelines to protect the Indiana Bat as provided by the Division or in the Appendix.

1.3 JOB CONDITIONS

- A. The Plans do not purport to show all objects existing on the site.
- B. The locations of utility mains, structures, and service connections are not shown on the plans. The verification of existence and the exact location determination of utility mains, structures, and service connections shall be the responsibility of Contractor.
- C. Contractor shall not perform any work on or cause any damage to existing CRP land, wetlands, or any other jurisdictional lands adjacent to the seeding area. These areas are under the jurisdiction of other authorities. If damage does occur to these areas, Contractor shall restore them to an acceptable condition at no cost to Division.
- D. Contractor shall not perform excavation work under the drip line of trees encountered on site that are to remain. Contractor may request that certain trees within the Project Limits shown on the Plans remain in place. If permission is granted, Contractor shall protect these tree(s) from damage.
- E. Materials to be handled under this Contract, especially when or where repairs are specified, include spoil, gob and coal refuse which may be toxic and/or acidic in nature.
- F. Unless indicated otherwise in the Contract Documents, removed, salvaged or demolished materials shall be considered to be the property of Contractor. Contractor-salvaged materials and demolished materials shall be completely removed from the job site. Any items indicated in

the Contract Documents to be salvaged to the landowner, such as existing fencing, shall be stored on site at a location approved by Division.

- H. Contractor shall conduct all work in a manner which shall minimize, to the greatest practical extent, inconvenience to the public, and which shall result in a final product which leaves the site in an equal or better condition than prior to construction.

1.4 SUBMITTALS

- A. Contractor shall provide to Division a description and the location of any alternative off-site disposal area to be used other than a licensed landfill.
- B. Contractor shall submit a Construction Progress Schedule as specified in SECTION 3-24 CONSTRUCTION SCHEDULE of the General Conditions (*Document N*).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide materials, not specifically described but required for proper completion of the work of this SECTION, as selected by Contractor subject to the approval of Division.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. In company with Division personnel, visit the site and verify the location(s) of repairs, if required, and/or location(s) of subgrade preparation and required seeding area(s).
- B. All trees outside the Project Limits shown on the Plans shall remain undisturbed.

3.2 PROTECTION

- A. Contractor shall be responsible for locating and protecting all utilities prior to initiating work. If damage does occur to any existing utilities, Contractor shall restore them in a manner acceptable to the utility provider and Division at no cost to the Division.
- B. Contractor shall protect existing vegetation as discussed below.
 - 1. Protect tops, trunks, and roots of existing trees and/or shrubs, indicated or implied to remain, from damage during all operations. Box, fence around, or otherwise protect trees before adjacent work is started. Do not permit heavy equipment or stockpiles within branch spread. Trim or prune to obtain working space in lieu of complete removal whenever possible. Conform with good horticultural practices. Preserve natural shape and character. Refer to ISU Publication PM-909, "Preventing Construction Damage to Trees".
 - 2. Damaged trees shall be repaired or replaced to the satisfaction of Division. Repair may include, but not be limited to, trimming, pruning, and application of pruning paint. Repair shall be completed within seventy two (72) hours of occurrence of damage. Remove existing vegetation when damage occurs and survival is doubtful.

3. Adjacent areas to the site with established vegetation shall be protected. If access through established vegetation is required, Contractor shall coordinate his access with Division and restore the damaged areas as directed by Division.
- C. Contractor shall provide protection for persons and property as discussed below.
 1. Barricade open depressions and holes occurring as part of this work.
 2. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, burning of landscape waste, equipment vibration, and other hazards created by operations under this SECTION.
- D. Contractor shall use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Contractor shall maintain access to the site at all times.

3.3 LAY-DOWN AREA

- A. If Contractor would like a laydown area to store equipment or supplies, the location should be coordinated with the Division in consultation with the landowner.

3.4 EXISTING FENCES

- A. Any existing fences within the project limits shall be protected. If these fences are damaged, the Contractor shall repair them at no cost to Division. Fences can be removed for access as needed if location is approved by Division. After work is completed, the removed fence shall be repaired or a replacement fence of the same material type or better shall be replaced at the same location at no cost to Division.

3.5 CLEAN-UP AND REPAIRS

- A. Contractor shall remove equipment, project materials, and wastes such as oil drippings, stones, gravel, packaging containers, etc., from the site and dispose of wastes at an approved off-site location.
- C. All disturbed areas outside the Project Limits, such as entrance and haul roads and lay down areas, shall be returned to their original condition by Contractor and as approved by the Division.
- D. The materials, equipment, and labor for clean up and repairs are at no cost to Division.

3.6 MEASUREMENT AND PAYMENT

The construction cost of all work included in this SECTION of the Construction Specifications shall be included in Contractor's unit prices set forth in the Proposal and Schedule of Prices (*Document C*) for the work items described below. The unit price for each of these items shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the unit prices so set forth by the amount of the work actually constructed, measured as described herein, shall constitute full payment to Contractor for performance of the work included in this SECTION.

Measurement and payment for each work item in this SECTION shall be in accordance with the following:

- A. *Mobilization*: Payment for the cost of mobilization and demobilization and other work incidental thereto shall be included in the lump sum price set forth for "Mobilization." The lump sum price

set forth in Contractor's Proposal and Schedule of Prices shall include full compensation for mobilization; for preparatory work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to and through the site; for establishment of facilities necessary for work on the project; for installing the project sign and removing a portion thereof; for demobilization, and cleanup and repairs; for all other work or operations which must be performed or costs incurred when beginning or performing work on the project including bonding, insurance, obtaining permits, filing affidavits, paying fees, etc. See General Conditions (*Document N*) Item 6-01 and any permits included in an appendix to the specifications.

The amount which Contractor will receive payment for, in accordance with the following schedule, will be limited to five percent (5%) of the total Contract bid. Should the Contractor's bid for this item exceed five percent (5%), the amount over five percent (5%) will not be paid until the Contract is finalized.

Basis of Payment: Partial payment of the lump sum amount bid for Mobilization, not exceeding five percent (5%), will be made in accordance with the following schedule:

1. Upon Contract execution, ten percent (10%) of the pay item will be paid if the resulting payment is at least one hundred dollars (\$100) after retainage is withheld
2. When five percent (5%) or more of the original Contract amount is earned, an additional twenty percent (20%) of the pay item will be paid.
3. When ten percent (10%) or more of the original Contract amount is earned, an additional twenty percent (20%) of the pay item will be paid.
4. When fifty percent (50%) or more of the original Contract amount is earned, the remaining balance of the pay item will be paid up to a maximum of five percent (5%) of the total bid.

Nothing herein shall be construed to limit or preclude partial payments for other items as provided for by the Contract.

B. *Summary:* Proposal Bid Items applicable to work covered by this SECTION are as follows:

<u>Description</u>	<u>Unit</u>
Mobilization	Lump Sum

END OF SECTION 02105

INDEX

SECTION 02420 – SEED BED PREPARATION, PERMANENT SEEDING

PART 1 - GENERAL

- 1.1 DESCRIPTION
- 1.2 QUALITY ASSURANCE
- 1.3 PERMITS AND FEES
- 1.4 DELIVERY, HANDLING, AND STORAGE
- 1.5 SUBMITTALS
- 1.6 SITE DISTURBANCES

PART 2 - PRODUCTS

- 2.1 AGRICULTURAL LIME – ACID AREAS
- 2.2 MULCH – ACID AREAS
- 2.3 HERBICIDE

PART 3 - EXECUTION

- 3.1 ACID AREAS
- 3.2 TEMPORARY SEDIMENT CONTROL (TSC) REMOVAL
- 3.3 RILL REPAIR
- 3.4 MOWING
- 3.5 CHEMICAL BURN-DOWN
- 3.6 ROCK PICK UP
- 3.7 MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This site has been reclaimed in the recent past and seeded with an interim seeding mix. Care shall be taken to not excessively disturb the surface and expose acidic material. The purpose of this section is to prepare the site for permanent seeding.
- B. Work under this SECTION covers requirements for materials, tools, equipment and services necessary to complete the seed bed preparation prior to permanent for this project. The work shall include, but is not necessarily limited to, completion of the following work:
 - 1. Removal of temporary sediment controls;
 - 2. Lime and mulch application in acid areas;
 - 3. Mowing;
 - 4. Herbicide application;
 - 5. Disking for minor rilled areas;
 - 6. Rock picking.

1.2 QUALITY ASSURANCE

- A. Contractor shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of work of this SECTION.
- B. Contractor shall use equipment adequate in size, capacity, and numbers to accomplish work in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, Contractor shall comply with directives of Engineer and Division.

1.3 DELIVERY, HANDLING, AND STORAGE

- A. Storage of materials on job site must be approved in writing by Division.
- B. Materials approved for storage on site which are being degraded due to storage must be removed and replaced at no additional cost to Division.
- C. Deliver packaged materials to site in supplier's original unopened containers; each container to bear certification as specified.
- D. Store packaged materials off ground and protect from moisture.

1.4 SUBMITTALS

- A. Agricultural lime
 - 1. Contractor shall submit vendor's certified analysis for ECCE (Effective Calcium Carbonate Equivalent) in minimum pounds of ECCE per ton of material, fineness of agricultural lime, and supplier's name and location.

B. Weight Tickets

1. Contractor shall submit weight tickets and/or shipping tickets of all materials delivered to the site for the work in this SECTION to Division for payment purposes.

1.5 SITE DISTURBANCES

- A. Contractor shall take precautions to insure that equipment and vehicles do not unnecessarily disturb or damage existing grading or other site improvements. Any areas identified by Division as becoming excessively disturbed shall be repaired at Contractor's own expense.

PART 2 - PRODUCTS

2.1 AGRICULTURAL LIME – ACID AREAS

- A. Agricultural lime shall be ground calcitic limestone conforming to the current requirements of the Iowa Department of Agriculture and Land Stewardship. The liming material shall contain calcium in the carbonate, oxide or hydroxide form, or a combination thereof. The lime shall have a minimum fineness of fifty-five percent (55%) and shall contain at least one-thousand (1000) pounds ECCE per ton of lime to be applied.
- B. If lime containing not less than one-thousand (1000) pounds ECCE per ton is not locally available, Contractor may submit a proposal for use of equivalent material based upon the minimum pounds required of ECCE per acre.
- C. Lime sludge salvaged from water treatment plants or other industrial operations can be used for agricultural lime provided that it can be uniformly distributed over the site. Moisture content and ECCE tests results shall be provided to Division to determine application rates. Moisture tests will be taken by the Division during placement and application rates will be adjusted as appropriate.

2.2 MULCH – ACID AREAS

- A. Mulch materials shall consist of oats, rye, hay, grass cut from native grasses or other plants approved in writing by Division.
- B. Mulch shall be of air dry mulch that has been properly cured and harvested. Mulch harvested after a killing frost or during dormant periods will not be acceptable. Mulch shall not be rotted, brittle, moldy, caked or otherwise degraded.
- C. Mulch shall be free of noxious weeds as published by the local County Weed Commissioner and other weeds deemed undesirable by Division, such as foxtail, etc.
- D. Each load of mulch shall be subject to inspection and acceptance by Division prior to unloading.

2.3 HERBICIDE

- A. An herbicide, such as glyphosate, shall be used at the site to kill off the existing vegetation. The specific type and application rate shall be provided to Division.

PART 3 - EXECUTION

3.1 ACID AREAS

- A. The specified amount of lime in the Supplemental Specifications and five (5) tons per acre of mulch will be thoroughly incorporated into the upper one-foot of material in areas as indicated on the plans and as specified and directed by the Division.
- B. These areas should not be permanently seeded until the neutralization period has occurred, which could take up to three (3) months depending upon weather conditions. These areas will receive permanent seeding after the neutralization period is complete.

3.2 TEMPORARY SEDIMENT CONTROL (TSC) REMOVAL

- A. Contractor shall review the site conditions and determine the overall quantity and type of temporary sediment control measures on site that are to be removed. Any practices to remain in place are noted on the site plan.
- B. All removed materials are to be disposed of off-site in an appropriate manner.
- C. Any accumulated sediment is to be distributed evenly in the nearby area in such a manner as to fill any rills and not create areas for water to accumulate.

3.3 RILL REPAIR

- A. Areas where minor rilling has occurred shall be lightly disked prior to seeding. Care shall be exercised to make sure moisture conditions will allow minor disking to fill the rilling. Disking should not be performed during periods of excessive moisture.
- B. If rilling recurs due to an elapsed period of time between the light disking and seeding, this rilling will be repaired by Contractor at no additional cost to Division.
- C. The methods and equipment to be used must meet the approval of Division.

3.4 MOWING

- A. Contractor shall complete at least one mowing of the site prior to seeding.
- B. Mowing shall be performed with a bat wing or flail-type mower set at a height between six (6) to eight (8) inches. Mowing shall not to be done with a sickle bar mower or mower-conditioner.
- C. If mowing is performed prior to seeding without a chemical burn down, the mowing should be performed in such a way or with such equipment so that residue is shredded into fragments no longer than six (6) inches without leaving clumps or windrows to interfere with later seed placement.

3.5 CHEMICAL BURN-DOWN

- A. If seeding is to be completed in the spring, a chemical burn down shall be used. The chemical burn down shall be applied no sooner than one (1) week after mowing and prior to plants growing to a total height of more than eighteen (18) inches.

- B. If existing vegetation becomes greater than eighteen (18) inches in height prior to applying herbicide, than the vegetation shall be mowed again as stated above. The additional mowing shall be done at the Contractor's own expense unless the Division agrees that weather caused the delay.
- C. Unless otherwise noted, all areas of the site shall have glyphosate sprayed over the vegetation at the labeled rates. Chemical burn down shall be completed by a licensed and certified pesticide applicator.

3.6 ROCK PICKUP

- A. Dispose of rocks and other objects which are six (6) inches or greater in diameter prior to seeding. These obstructions will become apparent after mowing. These materials shall be disposed of as discussed in the supplemental specifications. Rock pick up is incidental to mowing.

3.7 MEASUREMENT AND PAYMENT

Construction cost of all work included in this SECTION of the Construction Specifications shall be included in Contractor's unit prices set forth in Proposal and Schedule of Prices (*Document C*) for work items described below. Unit price for each of these several items shall include its pro rata share of overhead so that sum of products obtained by multiplying unit prices so set forth by amount of work actually constructed, measured as described herein, shall constitute full payment to Contractor for performance of work included in this SECTION.

Measurement and payment for each work item in this SECTION shall be in accordance with following:

- A. *Agricultural Lime, Acid Areas:* Contractor's unit price for agricultural lime applied to acid areas shall represent full payment for furnishing, delivery, and application of agricultural lime in accordance with specifications. Submittals required under Item 1.5 *Submittals* of this SECTION shall accompany each shipment of agricultural lime for payment.

Measurement for payment purposes shall be actual number of tons of ECCE, based on a dry unit weight, applied by Contractor in complying with requirements of this SECTION. The cost for incorporation of the agricultural lime shall be incidental to *Mulch, Acid Areas*.

- B. *Mulch, Acid Areas:* Contractor's unit price for this mulch shall represent full payment for all materials, application, mixing, plowing, disking, and all incidental work pertaining to incorporating the mulch with agricultural lime as a part of the lime-mulch application.

Division will determine in acres, to the nearest one-tenth (1/10) acre, the actual area in which the mulch application has been completed. Delivery receipts showing certified weight prior to placement will be used to confirm required tons per acre incorporation of mulch.

- D. *Temporary Sediment Control (TSC) Removal:* Contractor shall provide a lump sum cost to remove the identified temporary sediment control practices from the prior contract on the site. This lump sum cost includes all necessary equipment and personnel to remove the items and properly distribute any accumulated settlement. In addition, the removed items shall be removed from the site and disposed of in a proper manner.
- E. *Rill Repair:* Rilled areas identified by Division shall be repaired prior to permanent seeding. Contractor will provide the necessary equipment and personnel to prepare these areas for

permanent seeding. The Contractor will be paid at the bid hourly rate for the amount of time approved by Division.

- F. *Mowing:* Contractor shall submit a per acre price to complete one mowing of all seeded areas of the site. Depending upon site conditions, the Division may reimburse Contractor for additional, approved mowing at the bid unit price. The cost of mowing shall include all equipment and personnel needed to complete this work. The cost to provide rock pick up on a site is incidental and shall be included in the cost of mowing.
- G. *Chemical Burn-down:* Contractor's unit price for chemical burn down shall include the application of glyphosate to the existing vegetation. Chemical burn down shall be completed by a licensed and certified pesticide applicator. The area will be determined by the Division to the nearest 0.1 acre.
- H. *Summary:* Proposal bid items applicable to work covered by this SECTION are as follows:

<u>Description</u>	<u>Unit</u>
Agricultural Lime, Acid Areas	Ton (ECCE)
Mulch, Acid Areas	Acre
Temporary Sediment Control (TSC) Removal	Lump Sum
Rill Repair	Hours
Mowing	Acre
Chemical Burn-Down	Acre

END OF SECTION 02420

INDEX

SECTION 02720 – PERMANENT SEEDING

PART 1 - GENERAL

- 1.1 DESCRIPTION
- 1.2 QUALITY ASSURANCE
- 1.3 JOB CONDITIONS
- 1.4 SUBMITTALS
- 1.5 DELIVERY, STORAGE, AND HANDLING
- 1.6 SITE DISTURBANCES

PART 2 - PRODUCTS

- 2.1 AGRICULTURAL LIME
- 2.2 FERTILIZER
- 2.3 SEED
- 2.4 LEGUME SEED INOCULANT

PART 3 - EXECUTION

- 3.1 TIMING
- 3.2 LIMING AND FERTILIZING
- 3.3 SEEDING
- 3.4 MAINTENANCE
- 3.5 MINIMUM REQUIREMENTS FOR ACCEPTANCE
- 3.6 MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This site has been reclaimed in the recent past and seeded with an interim seeding mix and the seedbed preparation should be completed as provided in SECTION 02420. The purpose of this SECTION is to apply fertilizer, and seed. The seed mix will vary based upon the intended use and is reflected in the Supplemental Specifications/Scope of Work provided.
- B. Work under this SECTION covers requirements for materials, tools, equipment and services necessary to complete the seeding of all areas as indicated on the plans. Work related to SECTION 02420 should be completed first. The work shall include, but is not necessarily limited to, completion of the following work:
 - 1. Placement of lime and fertilizer;
 - 2. Placement of Permanent Seeding.

1.2 QUALITY ASSURANCE

- A. Qualifications of Workers: Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all work performed under this SECTION.
- B. All seed shall meet or exceed requirements contained in specifications of this SECTION and Federal, State and County laws requiring inspection for plant disease and insect control and shall be labeled and certified in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act and Iowa State laws. All seed must be dated for test and be from the last season prior to date of delivery.
- C. Lime Materials shall be a Standard Ground Agricultural Limestone which meets current requirements of the Iowa Department of Agriculture and Land Stewardship as prescribed under the Iowa Agricultural Limestone Act.
- D. Fertilizer shall be a commercial grade fertilizer and shall meet standards for grade and quality as per the requirements of the Iowa Department of Agriculture and Land Stewardship.
- E. Inoculants used for treating legume seed shall be pure culture of nitrogen-fixing bacteria prepared specifically for the legumes specified in PART 2 PRODUCTS of this SECTION. Inoculant containers must be clearly marked by the manufacturer for each specified species and have an expiration date.
- F. Division reserves the right, at any time, to sample all materials for testing to determine compliance with the requirements of this SECTION.

1.3 JOB CONDITIONS

- A. Areas to be seeded include all project areas as indicated on the site plan and any other seeded areas that get disturbed to access the site.
- B. Seeding shall be performed only during the seasons specified. The planting operation shall not be performed during times of drought, excessive moisture, or other unfavorable climatic conditions.

- C. Prior to the work of this SECTION, items of work listed in SECTION 02420 along with any other designated repairs should be completed.
- D. Some acid areas may have been treated with lime and mulch and should not be seeded with the permanent seed mix until after the neutralization period has been completed.

1.4 SUBMITTALS

- A. Certificates and Receipts
 - 1. Certification shall be submitted to Division that all seed to be used is in compliance with the following:
 - a. The Federal Seed Act.
 - b. Iowa Department of Agriculture & Land Stewardship regulations.
 - c. Species type and pounds of pure live seed (PLS) certification.
 - d. Date and results at germination and purity tests.
 - e. Test date to determine the percentages of germination and purity have been completed within a nine (9) month period, exclusive of the calendar month in which the test was completed.
 - f. The seed analysis on the label shall be mechanically printed.
 - 2. Suppliers certification of Effective Calcium Carbonate Equivalent (ECCE) content per ton of material must be submitted to and approved by Division prior to initial applications and subsequently as requested by Division. Necessary information shall include:
 - a. Name and location of supplier.
 - b. Name and address of agency and/or laboratory making ECCE determination.
 - c. Clear identification of stockpile from which limestone is obtained.
 - d. Date of last ECCE test and those for the previous four (4) tests on which ECCE is based.
 - e. Receipts stating weight of material on each truck which arrives on site.
 - 3. Fertilizer delivered in bulk shall be accompanied by the suppliers' certification of analysis and weight for each shipment made to the job site. Fertilizer delivered in individual containers shall be sealed and clearly marked for analysis and weight.
 - 4. Inoculants delivered to the job site must be clearly identified and marked with expiration dates.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle materials in accordance with the General Conditions and the Special Conditions.
- B. Storage of all materials on the job site must be approved in writing in advance by Division.
- C. Any materials approved for storage on site which, in the opinion of Division or Division, are being degraded due to storage must be removed and replaced at no additional cost to Division.
- D. Use all means necessary to protect materials from the elements during delivery, handling and storage.

- E. Deliver packaged materials (seed, etc.) to site in supplier's original unopened containers; each container to bear certification as specified. Pure live seed (PLS) certification shall be attached to all seed containers and shall not be removed except by Division.
- F. At no time shall seed materials or inoculants be stored outside of the specified planting periods. Inoculants shall be stored in a cool place, away from heat. Partially used packages of inoculants shall be tightly resealed.
- G. Store packaged materials off ground and protect from moisture. Moisture damaged materials are unacceptable. Wet, moldy or otherwise damaged seed is unacceptable.

1.6 SITE DISTURBANCES

- A. Take precautions to insure that equipment and vehicles do not unnecessarily disturb or damage existing grading, other site improvements, or adjacent areas to the work.
- B. Repair any damage and return site and adjacent areas disturbed by Contractor's operations to original condition at no cost to Division.

PART 2 - PRODUCTS

2.1 AGRICULTURAL LIME

- A. Agricultural lime shall be ground calcitic limestone conforming to the current requirements of the Iowa Department of Agriculture and Land Stewardship. The lime shall have a minimum fineness of fifty five percent (55%) and shall contain not less than 1000 pounds ECCE per ton of lime to be applied.
- B. If lime containing not less than 1000 pounds ECCE per ton is not locally available, Contractor may submit a proposal for use of equivalent material based upon the minimum pounds required of ECCE per acre.
- C. Lime sludge salvaged from water treatment plants or other industrial operations shall not be approved as a substitute for agricultural lime for this portion of the project.

2.2 FERTILIZER

- A. Inorganic fertilizer shall be a standard commercial product which, when applied at the proper rate, shall supply the quantity of total nitrogen (N), available phosphoric acid (P), and soluble potassium (K) as specified herein.
- B. Inorganic fertilizer shall be a commercial balanced fertilizer, uniform in composition, liquid or dry and free flowing. Fertilizer may be delivered bulk from the supplier or in its original unopened containers. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

2.3 SEED

- A. Seed delivered to the job site shall be labeled according to the U.S. Department of Agriculture Federal Seed Act and shall be furnished in containers with tags showing seed mixture, purity, germination, weed content, name of seller, and date on which seed was tested.
- B. Moldy seed or seed that has been damaged in storage shall not be used. Seed that is more than one growing in ages shall not be used.

- C. Seed Mixture: Seed mixtures shall consist of the varieties, mixtures and application rates by pounds pure live seed (PLS) per acre as stated in the Supplemental Specifications and as determined below:

$$\text{Pure Live Seed per pound (PLS/lb)} = \frac{(\% \text{ purity}) \times (\% \text{ germination})}{100 \quad 100}$$

$$\text{Actual pounds of seed per acre} = \frac{\text{lbs PLS per acre}}{(\text{PLS})/\text{lb.}}$$

2.5 LEGUME SEED INOCULANT

- A. Inoculant for treating leguminous seed shall be a pure culture of nitrogen-fixing bacteria, specific for the seed species to be inoculated. Containers shall be plainly marked with the expiration date for use and manufacturer's directions for inoculating seed.
- B. Methods of inoculation shall conform to manufacturer's recommendations for the particular species of legume.
- C. Inoculants shall be applied at the manufacturer's recommendation.
- D. Use sufficient inoculants to cover all leguminous seed before mixing with other seeds. Seed shall be slightly moistened or a sticker shall be used to ensure the inoculants adhere to the seed. The time lapse for sowing seed following inoculation shall not exceed 24 hours.

PART 3 - EXECUTION

3.1 TIMING

- A. Contractor shall wait at least one (1) week after application of herbicide for the chemical burn-down completed as part of SECTION 02420 before applying any lime or fertilizer.
- B. Seed should be applied within one (1) week after lime and fertilizer has been applied and within the specified seeding dates.
- C. Contractor shall monitor weather and may need to delay placement of lime, fertilizer or seed so that these items are not washed away prior to mulch placement.

3.2 LIMING AND FERTILIZING

- A. Agricultural lime, nitrogen (N), phosphorus (P), and potassium (K) shall be applied to all areas to be seeded, and shall be applied evenly over the surface in accordance with the rates determined by Division. The lime and fertilizer must be applied no more than one (1) week prior to seeding.

3.3 SEEDING

- A. All permanent seeding shall be completed within the seeding season dates shown below.

Spring	April 1 - May 30
Fall	August 15 - September 15
Dormant	November 15 to Freeze Up

- B. If Contractor foresees that seeding cannot be completed within the specified seeding seasons, he shall submit a written request for a seeding date extension to Division. All seeding completed outside of approved seeding dates is at Contractor's risk. Any repairs and reseeding that becomes necessary as a result of work completed outside the approved dates shall be completed by Contractor at no cost to Division.
- C. General Requirements:
1. As weather and site conditions permit, within the specified seeding season, seed site areas as shown on the Plans and all other disturbed areas.
 2. When conditions are such that less than satisfactory results are likely to be obtained by reason of drought, excessive moisture, snow, or frozen soil, seeding work shall be halted and resumed only when conditions are favorable or when approved alternative or corrective measures and procedures have been affected.
 3. Proceed with seeding work as rapidly as portions of the site become available within seasonal limitations. In any event, seeding shall be accomplished before the prepared seedbed becomes eroded, crusted over, or dried out and shall not be conducted when the ground is frozen or snow covered. Should seeding not be accomplished prior to the prepared seedbed becoming eroded, crusted over, or dried out, or the ground becomes snow covered or frozen, Division or Division shall require Contractor to rework the seedbed as necessary prior to seeding at no cost to Division.
 4. Schedule permanent seeding such that mulching of seeded areas takes place no later than forty-eight (48) hours after seeding partial areas. The time period between seeding and mulching shall be shortened if it appears adverse weather conditions could either cause damage to the seeded area or delay the timely application of mulch. If, prior to mulching, the seeded area is damaged by adverse weather, or success of the seeding is in doubt due to Contractor's failure to apply mulch in a timely manner, the seedbed or the area so affected shall be reprepared and the area reseeded, all at no additional compensation. Reapplication of lime, fertilizer, or both may also be required depending on Division's or Division's opinion of the severity of damage due to weather or, in the case of fertilizer, on the time lapse between initial fertilizer application and reseeding. Reapplication of lime and/or fertilizer, if required by Division or Division, shall also be done at no cost to Division.
- D. Permanent Seeding:
1. Seed all areas to be seeded with the appropriate seed mix as shown on the Plans. Seed shall be applied at the rates provided in the Supplemental Specifications or in the plan sheets. Sow seed with the contour using a grassland or rangeland drill set for the specified seeding rates. The spacing of the rows shall not exceed six (6) inches. The drill shall be equipped with double coulter furrow openers. The drill shall be designed to handle native seeds and be capable of seeding into existing live or dead vegetation. The seeding equipment shall be subject to acceptance by Division. Overlap each successive seeding pass to ensure complete coverage. Upon a show of green, bare areas will be reseeded at no additional cost to Division.
 2. Embed the seed at a depth recommended for the species.
 3. Broadcasting by centrifugal-type or hydroseeder broadcasters, or by hand may be allowed in areas not accessible to drills or other equipment with Division approval.

Where possible, the seed must be covered with soil to a depth recommended for the species.

4. Upon completion of the seeding operation, cultipack the seedbed to provide a positive seed-soil contact. If the drill seeder is equipped with an approved cultipacker or press wheels, separate operations shall not be necessary in these areas. All areas where seed is placed using a centrifugal type or hand seeding shall be cultipacked. The type of cultipacker/seeder to be used shall be subject to acceptance by Division.

3.4 MAINTENANCE

A. Protection of Seeding:

1. Vehicular traffic on areas seeded shall be restricted to travel necessary to establish seeding and other travel approved by Division.

B. Reconditioning Existing Areas:

1. Contractors equipment, project materials, and wastes such as oil drippings, stones, gravel, packaging containers, etc., shall be removed from the site or disposed of in a manner approved by Division and Division.
2. All disturbed areas outside the project limits, such as entrance and haul roads, shall be reconditioned and planted to the satisfaction of the Division.

3.5 MINIMUM REQUIREMENTS FOR ACCEPTANCE

- A. Ninety (90) days following evidence of plant growth or green-up, Division and Contractor shall inspect and evaluate the seeded areas for acceptance based on the criteria listed below.
- B. The plant growth shall provide a minimum of seventy-five (75%) cover over the seeded area. Areas failing to meet this cover density shall be interseeded as required by Division, at no cost to Division.
- C. Following repair of defects and unaccepted areas, the repaired areas will again be inspected ninety (90) days after evidence of plant growth or greenup. These areas shall be evaluated using the criteria listed in this Section.
- F. In the event that either the original seeding or reseeding, it is found that the work, materials, or seedbed preparation failed to meet the quality or application rates specified, additional work shall be required at no cost to Division.

3.6 MEASUREMENT AND PAYMENT

The construction cost of all work included in this SECTION of the Construction Specifications shall be included in Contractor's unit prices set forth in the Proposal and Schedule of Prices (*Document C*) for the work items described below. The unit price for each of these several items shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the unit prices so set forth by the amount of the work actually constructed, measured as described herein, shall constitute full payment to Contractor for performance of the work included in this SECTION.

Measurement and payment for each work item in this SECTION shall be in accordance with the following:

- A. *Agricultural Limestone, Seeding:* Contractor's unit price for limestone used in permanent seeding work shall represent full payment for the furnishing, delivery, application and incorporation as per these specifications. The actual application rate will vary pending the recommendation of soil tests conducted in SECTION 02420.

Measurement for payment purposes shall be the actual number of tons of effective calcium carbonate equivalence (ECCE) applied by Contractor in complying with requirements of this SECTION. Weight tickets must accompany each shipment of agricultural lime and shall form the basis for measurement and payment.

- B. *Nitrogen (N), Phosphorous (P), and Potassium (K):* Payment for all fertilizer furnished, delivered, applied and incorporated into seedbeds, per requirements of this SECTION, shall be made in accordance with Contractor's unit prices. The actual application rates for Phosphorous (P) and Potassium (K) will vary pending results of soil tests conducted SECTION 02420.

Measurement for payment purposes shall be the actual weight to the nearest pound of each of the fertilizer components described.

- C. *Seeding:* Contractor's unit prices for permanent seeding shall represent full payment for the planting of all permanent seeded areas in accordance with requirements of this SECTION. Said unit price shall include the furnishing of all seed materials, inoculants, and planting of seeds, including all required equipment labor and any required reseeding to complete all permanent seeding as specified herein.

Measurement for payment purposes shall be the area seeded in acres, rounded to the nearest one-tenth (1/10) acre. The plan quantities will be used for payment in accordance with 7-01 MEASUREMENT (Document N). The Contractor can also provide field measurements to the Division to determine the number of acres seeded. Division will determine in acres, to the nearest one-tenth (1/10) acre, the actual area that seeding has been performed, based on Contractor's field measurements. Seeded areas outside the Project Limits will not be measured for payment. Payment for seeding shall be made only after all submittals have been approved as required under this SECTION.

- D. *Summary:* Proposal Bid Items applicable to work covered by this SECTION are as follows:

<u>Description</u>	<u>Unit</u>
Agricultural Lime, Seeding	Ton (ECCE)
Nitrogen (N)	Pound
Phosphorus (P)	Pound
Potassium (K)	Pound
Permanent Seeding	Acre

END OF SECTION 02720