GRANULAR SHOULDERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

Granular Shoulders.

1.02 DESCRIPTION OF WORK

Includes the requirements for construction of granular shoulders adjacent to the pavement or traveled way. Also includes granular fillets at paved edges.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Aggregate gradation results and Plasticity Index (PI) for the proposed source.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Crushed PCC or RAP may be substituted for crushed stone if allowed by the Engineer and meeting graduation requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

A. Aggregate Storage: Prevent segregation and contamination of shoulder aggregate; stockpile on firm, drained pads; and manage moisture to achieve target compaction without pumping.

B. Salvaged or Reclaimed Materials: The Contractor is responsible for obtaining the classification from an outside testing firm using the same tests as the Iowa DOT.

C. Disposal: Dispose of excess aggregate material according to applicable local, state, and federal regulations in a manner that does not cause damage or harm to adjacent properties or public facilities.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Granular Shouldering:

1. **Measurement:** Measurement will be in tons for the width and depth of granular shoulder material placed. Measurement will be based on the scale tickets for the material delivered and incorporated into the project.

2. **Payment:** Payment will be at the unit price per ton of granular material.

3. **Includes:** Unit price include, but is not limited to, proportioning and mixing material on site; prewetting, placing, shaping, and compacting the material; trimming and removing waste; and reworking to achieve tolerances.

B. Granular Fillets:

1. **Measurement:** Measurement will be in tons for the width and depth of granular fillet material placed. Measurement will be based on the scale tickets for the material delivered and incorporated into the project.

2. **Payment:** Payment will be at the unit price per ton of granular material.

3. **Includes:** Unit price include, but is not limited to, proportioning and mixing material on site; prewetting, placing, shaping, and compacting the material; trimming and removing waste; and reworking to achieve tolerances.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Class A: Comply with Iowa DOT Article 4120.04.

B. Class B: Comply with Iowa DOT Article 4120.05.

C. Class C: Use only when specified in the contract documents or allowed by the Jurisdictional Engineer. Comply with Iowa DOT Article 4120.03.

D. Recycled Aggregate Options: Use only when specified in the contract documents or allowed by the Jurisdictional Engineer. Comply with Iowa DOT Article 4120.02. for crushed PCC, RAP, or crushed composite HMA+PCC; uniformly blend with crushed stone. Limit recycled materials to ≤30% (new construction) or ≤50% (existing granular shoulder reconstruction).

PART 3 - EXECUTION

3.01 PREPARATION

A. Excavate, trim, and shape the shoulder subgrade to the lines and grades shown; remove unsuitable material; proof roll or compact the subgrade to a firm, uniform condition; and provide drainage away from pavement edge.

B. Coordinate with entrance and safety ramp transitions to maintain smooth cross slope continuity and avoid ponding at the pavement edge.

3.02 PLACEMENT, MIXING, AND PREWETTING

A. Verify aggregate is at appropriate moisture to achieve required compaction. If using Class A material when more than one aggregate is to be combined, mix the aggregates before delivery to the road. Except as allowed in Iowa DOT Article 2121.03, A, 2, premix aggregate with sufficient water to ensure all particles are uniformly wetted.

B. Place granular shoulder material on the subgrade so no material is deposited on the adjacent pavement surface. If material is inadvertently spilled on the adjacent pavement, immediately remove using shovels and brooms.

C. Spread and compact the granular shoulder material so the finished elevation and width conform to the specified cross section.

3.04 COMPACTION

A. Compact granular shoulder material with six complete coverages with a pneumatic-tired roller or a steel-vibratory roller, followed by at least one complete finish coverage with a steel-tired roller. The Engineer may reduce the rolling when unstable subgrade is encountered and may require additional finish rolling if needed to ensure a satisfactory surface finish. Shape concurrently with compaction. The tolerance for width of the completed shoulder is ± 0.2 foot.

B. Maintain the required moisture content in the granular shoulder material until it has been satisfactorily spread, compacted, and finished to the required dimensions.

3.05 SHAPING AND FINISHING

A. Shape and finish the shoulder to the specified cross slope (typically 4% or as shown) to ensure positive drainage away from the pavement; maintain a smooth interface with the pavement edge without creating edge drop-off.

B. Establish a uniform surface free of segregation, potholes, soft areas, or loose windrows; pull material from windrows uniformly and avoid thin streaks of fines.

C. Verify cross slope using a slope meter or template. Ensure shoulder cross slope is no less than specified or more than 1% greater than specified.

D. Where specified, construct shoulder fillets at pavement edges using aggregate meeting Iowa DOT Article 4120.07; compact and shape flush to the pavement with smooth transitions.

E. Acceptance requires a uniformly dense, well-drained shoulder surface free of segregation, rutting > 1/2 inch, or edge drop off > 1 inch; correct deficiencies by reshaping, adding material, moisture conditioning, and recompacting.

END OF SECTION