GABIONS AND RIP RAP

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Gabions and related materials needed for assembly.

B. Assembly of gabions.

C. Installation of gabions for construction of gabion channel lining and retaining walls.

D. Rip rap.

E. Rip rap installation.

1.02 DESCRIPTION OF WORK

A. Furnish and install gabions to lines and grades shown on the plans and as specified herein.

B. Prepare foundation soil and backfill to lines and grades shown on the plans.

1.03 SUBMITTALS

Follow the General Provisions (Requirements) and Covenants.

1.04 SUBSTITUTIONS

Follow the General Provisions (Requirements) and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Follow the General Provisions (Requirements) and Covenants.

1.06 SCHEDULING AND CONFLICTS

Follow the General Provisions (Requirements) and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT FOR PAYMENT

A. Gabions: Measurement shall be made for the number of cubic yards of the entire gabion structure. Total cubic yardage shall be attained by adding the volumes of each individual gabion.

B. Riprap: Measurement shall be made for the number of tons of riprap placed.

C. No payment shall be made for work or materials required under these specifications, contract documents, or plans, unless specifically listed as a bid item in the contract.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Baskets:

1. Rectangular baskets having hexagonal triple twist steel wire mesh; galvanized steel wire; zinc coating. Federal Specifications QQ-W461g being 11 1/4 gage mesh and 9 gage selvage rod.

2. Approved brands are Bekaert, Maccaferri, Terra Aqua or an approved equal.

B. Lacing Wire: Galvanized steel wire, 13 gage, with a minimum galvanized coating of 0.80 ounces per square foot.

C. Vertical Diaphragms:

1. Conform to requirements of basket wire.

2. Place on 3 foot centers and attach to base of baskets.

D. Connecting Wire:

1. Use as per manufacturer's specification and recommendation.

2. Connecting wire shall be used on 3 foot baskets.

E. Fill Stone:

1. Conform to Iowa DOT Articles 4130.01 and 4130.05, gradation number 34.

2. Well-graded broken limestone, dolomite, or quartzite in a nominal 6 inch mixture.

F. Filter Fabric: Composed of a non-woven material, conforming to Iowa DOT Article 4196.01, B.

G. Porous Backfill: Conform to Iowa DOT Section 4131.

H. Rip Rap:

1. Conform to Iowa DOT Section 4130, Class D or E Revetment with the following gradation:

Stone Size	% Larger Than
250 lbs.	0
90 lbs.	50 - 100
5 lbs.	90 - 100
1/2" Sieve	95 - 100

2. Consist of sound and durable limestone, dolomite, or quartzite in accordance with AASHTO T 96.

3. Broken concrete or rubble is not acceptable.

PART 3 - EXECUTION

3.01 BEDDING AND BACKFILL

A. Bedding:

1. The gabions shall be placed on a firm unyielding subgrade foundation. In fill areas construct and compact to a minimum of 95% of maximum Standard Proctor Density ASTM D 698.

2. The base at where the gabions shall be placed shall be level and at the proper elevation.

3. If an unsuitable foundation exists, remove and replace with suitable materials and compact to not less than a minimum of 95% of maximum Standard Proctor Density ASTM D 698.

B. Backfill:

1. Before installing the baskets, reshape the bank to a slope of at least 1.5 feet of horizontal distance for each foot of vertical drop.

2. Place and compact porous backfill and earth backfill as shown on detailed plates to not less than a minimum of 95% of maximum Standard Proctor Density ASTM D 698.

C. Filter Fabric:

1. Overlap a minimum of 6 inches.

2. Use where shown on detail plates.

3.02 ASSEMBLY

A. Unfold gabion, flatten all kinks and bends.

B. Erect sides, ends, and diaphragms with creases in proper positions and all tops of sides being level.

C. Lace four corners of gabion, followed by edges of diaphragms.

D. Lace gabion with alternating single and double loops no more than 6 inches apart.

3.03 INSTALLATION

A. Gabion Installations (Refer to Figure 9050.1):

1. Place Filter Fabric (Refer to Section 9050, 3.01, C) and assembled gabion units in the proper location as shown on plans.

2. Wire each unit securely to the adjacent units along the top and vertical edges.

3. After a row of gabions has been wired together, stretch before filling to achieve better alignment and finish.

4. Fill baskets by methods recommended by manufacturer. Maintain rectangular pattern as each basket is filled.

3.03 INSTALLATION (Continued)

5. Place outer layer of fill stone by hand to provide a square appearance. For retaining walls, place larger stone to simulate natural occurring ledge rock.

6. Empty gabions placed on top of a completed row must be wired to the filled gabions at front and back and lapped so end joints do not coincide. When the upper section only partially overlaps the lower section, the wiring shall be done along the point where the front edge of the empty section meets the filled section, and where the back edge of the filled section meets the base of the empty section.

7. Close and lace gabion basket lids by methods recommended by the manufacturer. Maintain level top to provide an even surface for next course.

8. Place porous backfill and earth backfill as shown on detailed plates on the lower sections.

9. For upper sections, overlap as per detailed plates, and wire the point where the front edge of the upper section meets the lower section and where the back edge of the lower section meets the base of the upper section.

10. Place porous backfill and earth backfill on the upper sections.

B. Rip Rap Installation:

1. Prepare subgrade to cross-section as shown on the plans.

2. Place rip rap on 4 inch thick stone filter or engineering fabric.

END OF SECTION