

PRESENTER:

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MODULAR GABION SYSTEMS

gragazzo@gabions.net

“GABION”

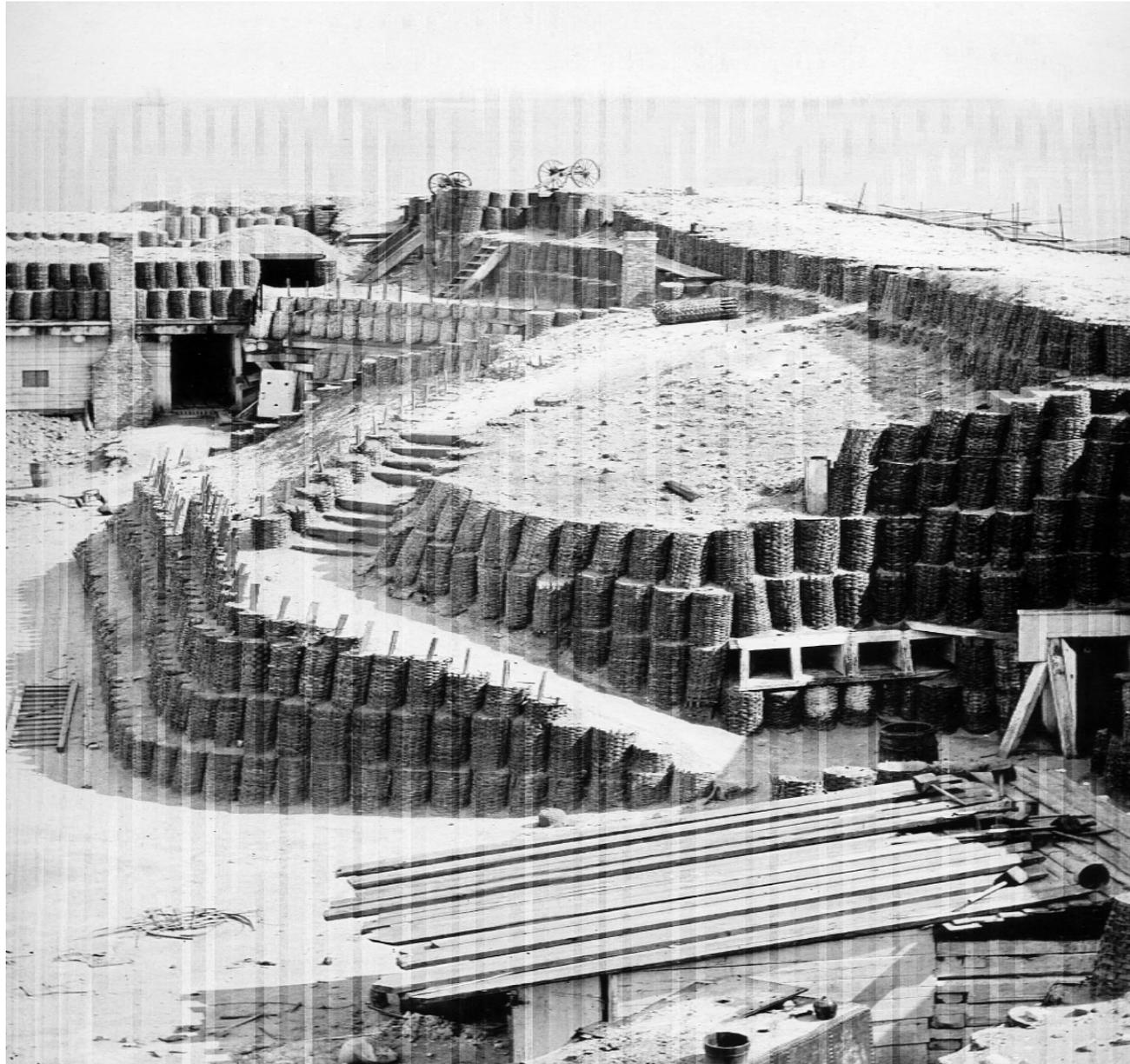
THE WORD ORIGINATED FROM:

- **LATIN - “CAVEA” = CAGE**
- **ITALIAN - “GABBIA” = CAGE**
- **ITALIAN - “GABBIONE” = LARGE CAGE**
- **ENGLISH - “GABION” = LARGE CAGE**

“GABION”

WEBSTER’S DEFINITION:

- 1. A cylinder of wicker filled with earth or stones, formerly used in building fortifications.**
- 2. A similar cylinder of metal, used in building dams, dikes, etc.**



**GABION FORTIFICATION – FT. SUMTER, SC
CIVIL WAR 1865**

GABIONS are steel wire mesh “large cages”, “baskets” or “containers”, which when **interconnected and rock-filled form monolithic, flexible, permeable structures** unique to solve the complex problems of erosion control, flood control, earth retention, bank stabilization, etc. at relatively low cost.

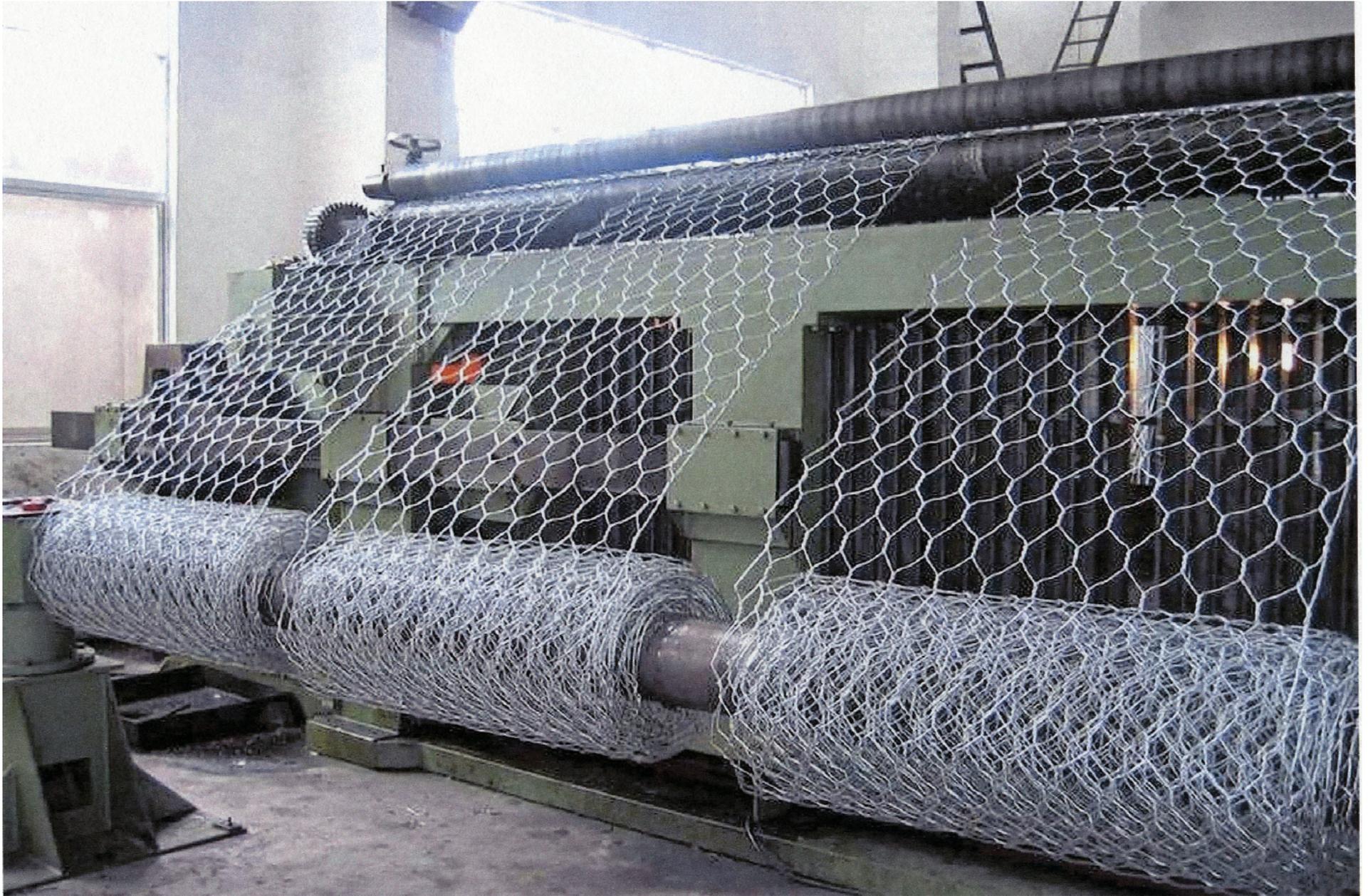
GABION WIRE

TYPES AVAILABLE

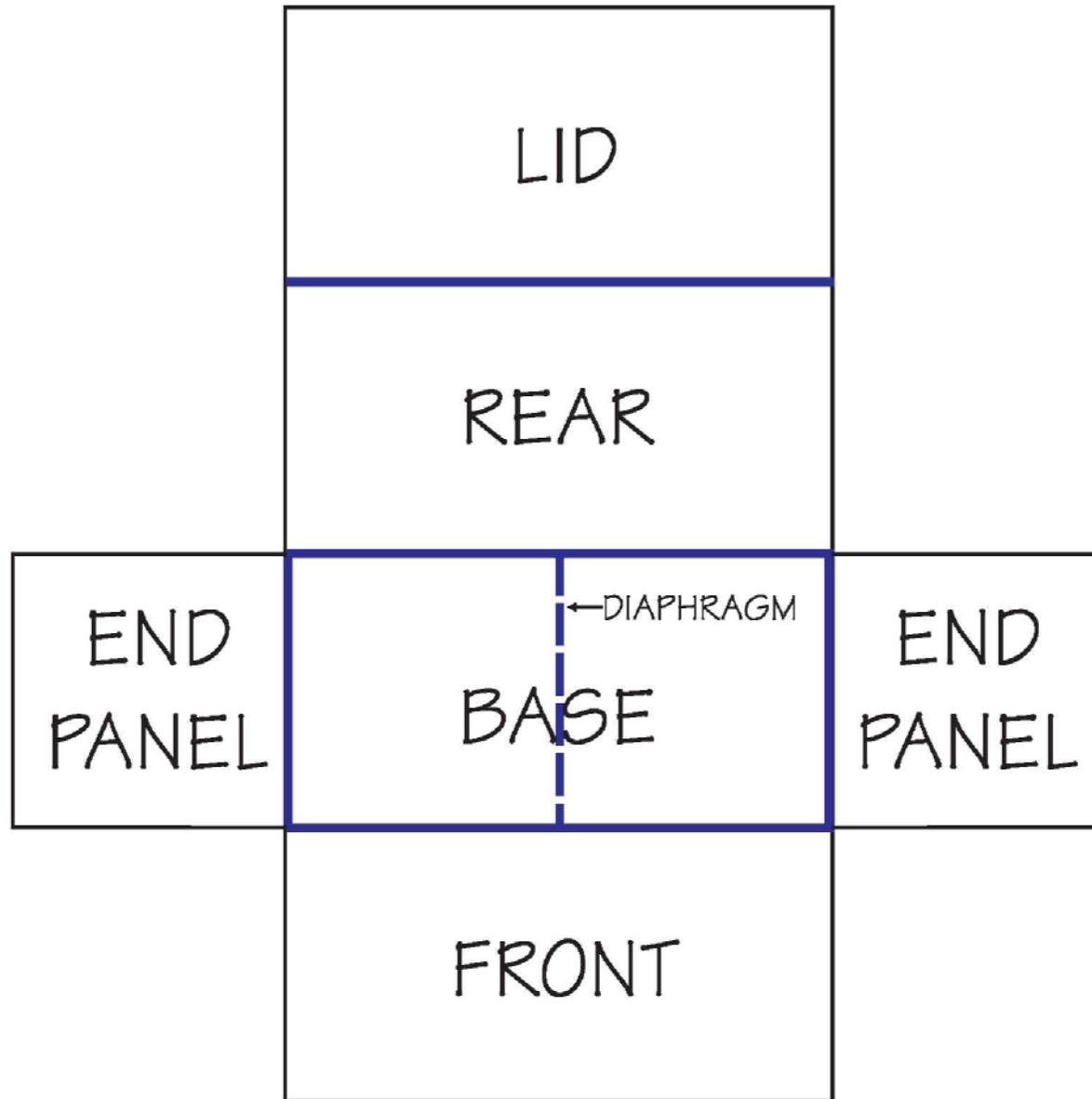
- **Galvanized wire – class 3 zinc coated**
- **Bezinal coated wire – 95% zinc
± 5% aluminum**
- **PVC coated wire – zinc or bezinal & PVC**
- **Stainless steel wire**



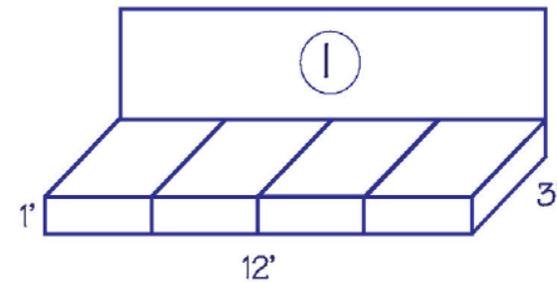
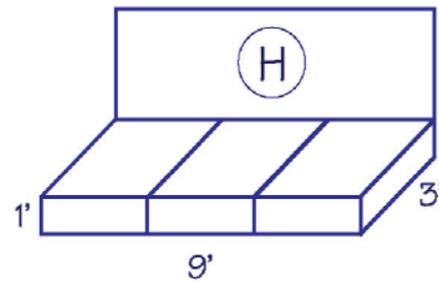
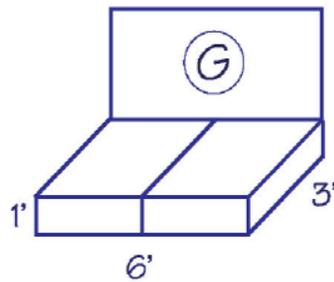
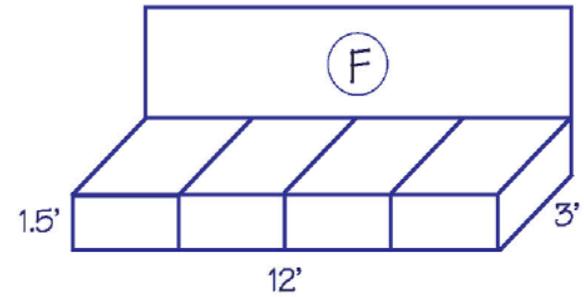
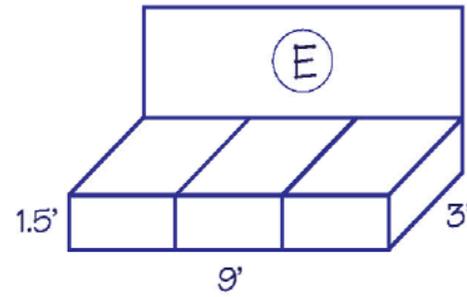
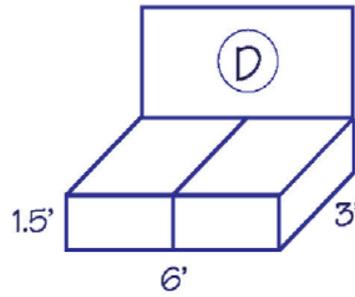
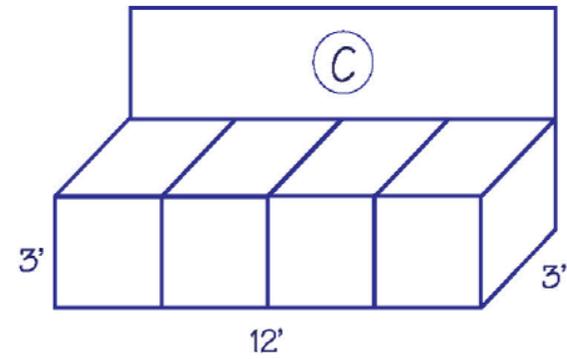
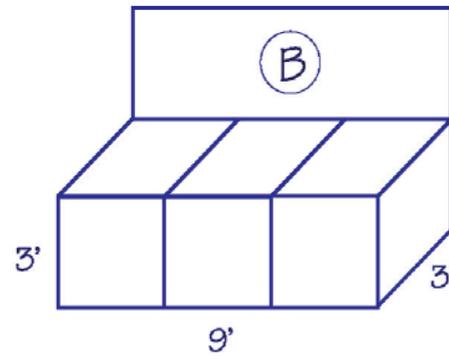
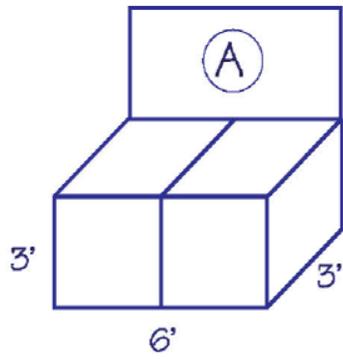
WELDED WIRE MESH GABION MACHINE
MESH IS PRODUCED IN ROLLS



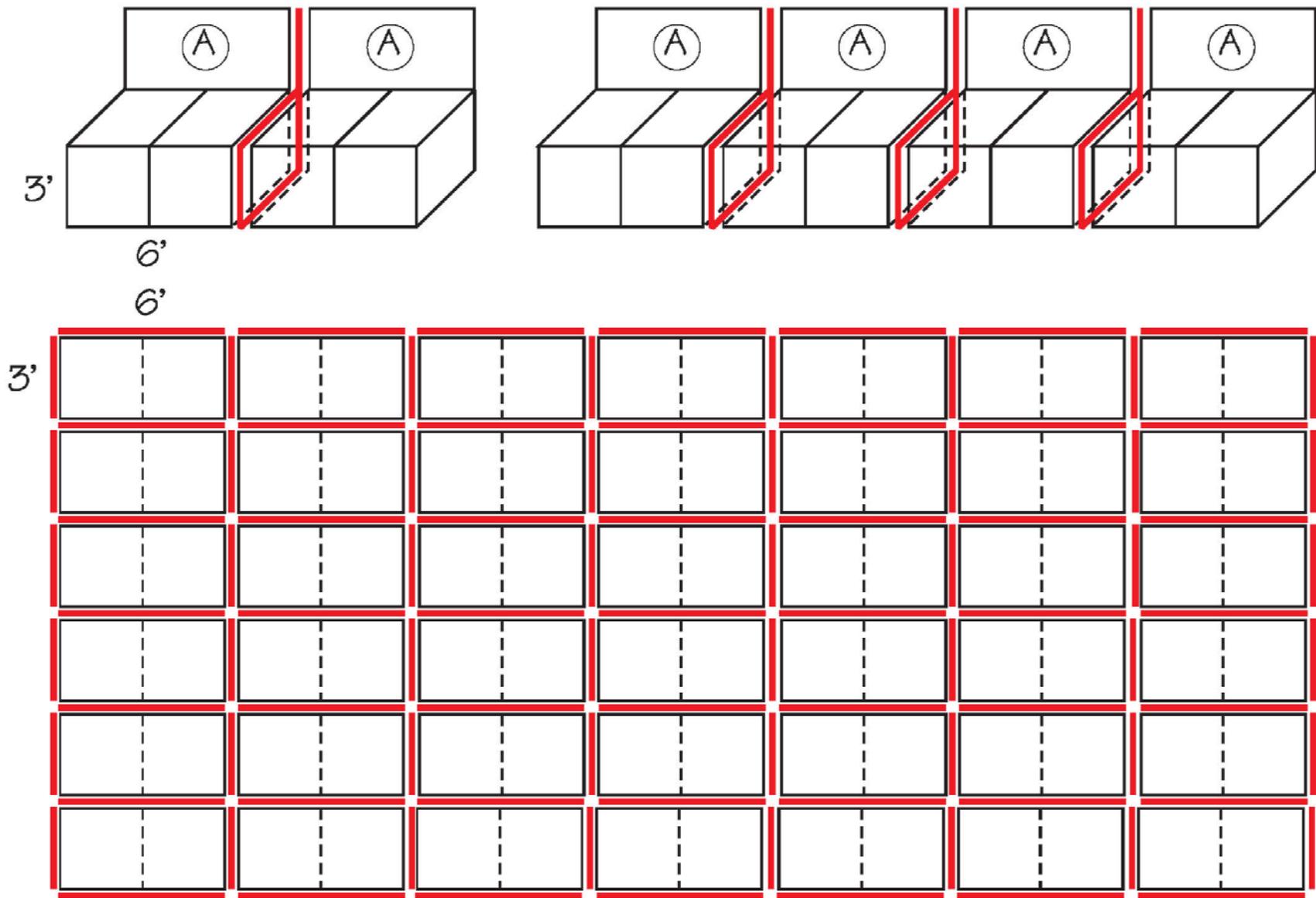
**TWISTED WIRE MESH GABION MACHINE
MESH IS PRODUCED IN ROLLS**



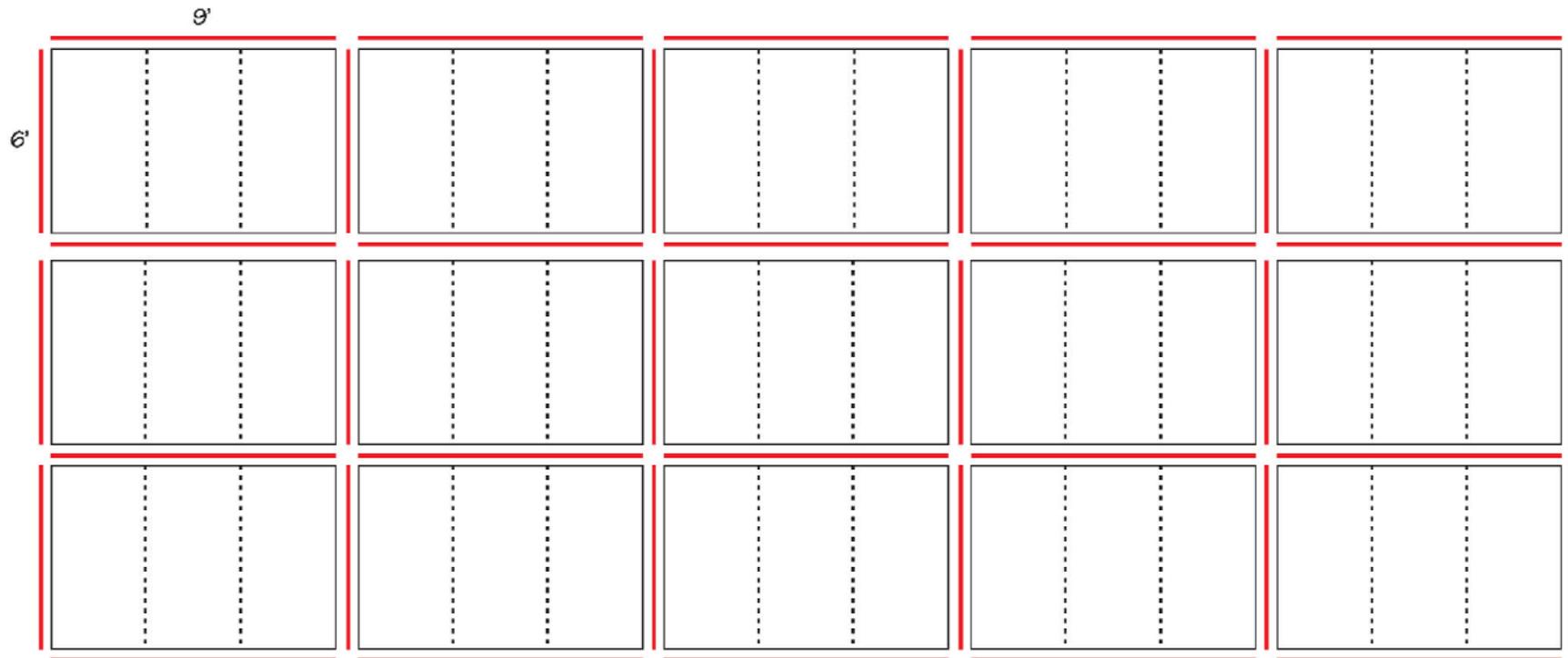
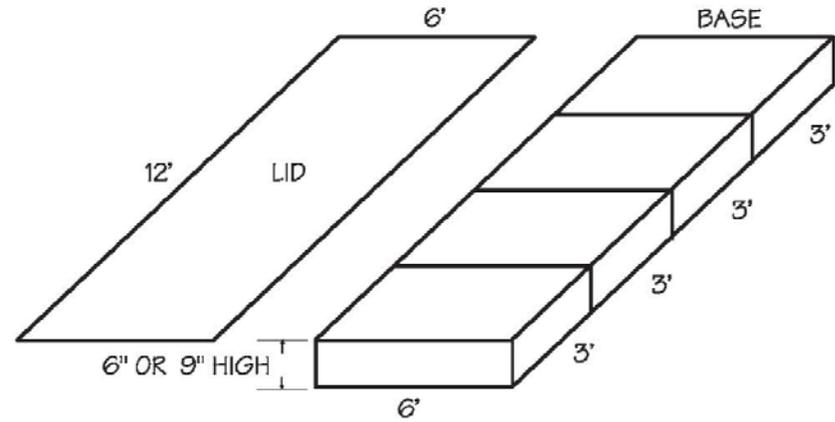
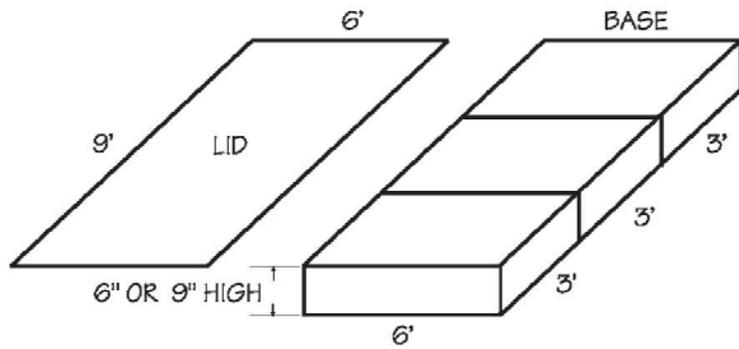
UNFOLDED-UNASSEMBLED GABION



STANDARD GABION SIZES



GABION LAYOUT - ISOMETRIC & PLAN VIEW



GABION MATTRESS LAYOUT ISOMETRIC & PLAN VIEW

JOINTLESS GABIONS

**Trapezoidal channel revetment
constructed with
PVC coated Gabion Mattress
utilizing jointless gabions
from “Roll-Stock” material.**



TRAPEZOIDAL CHANNEL REVETMENT - COMPLETED



**“ROLL-STOCK” GABION MATERIAL
DELIVERED TO JOBSITE**



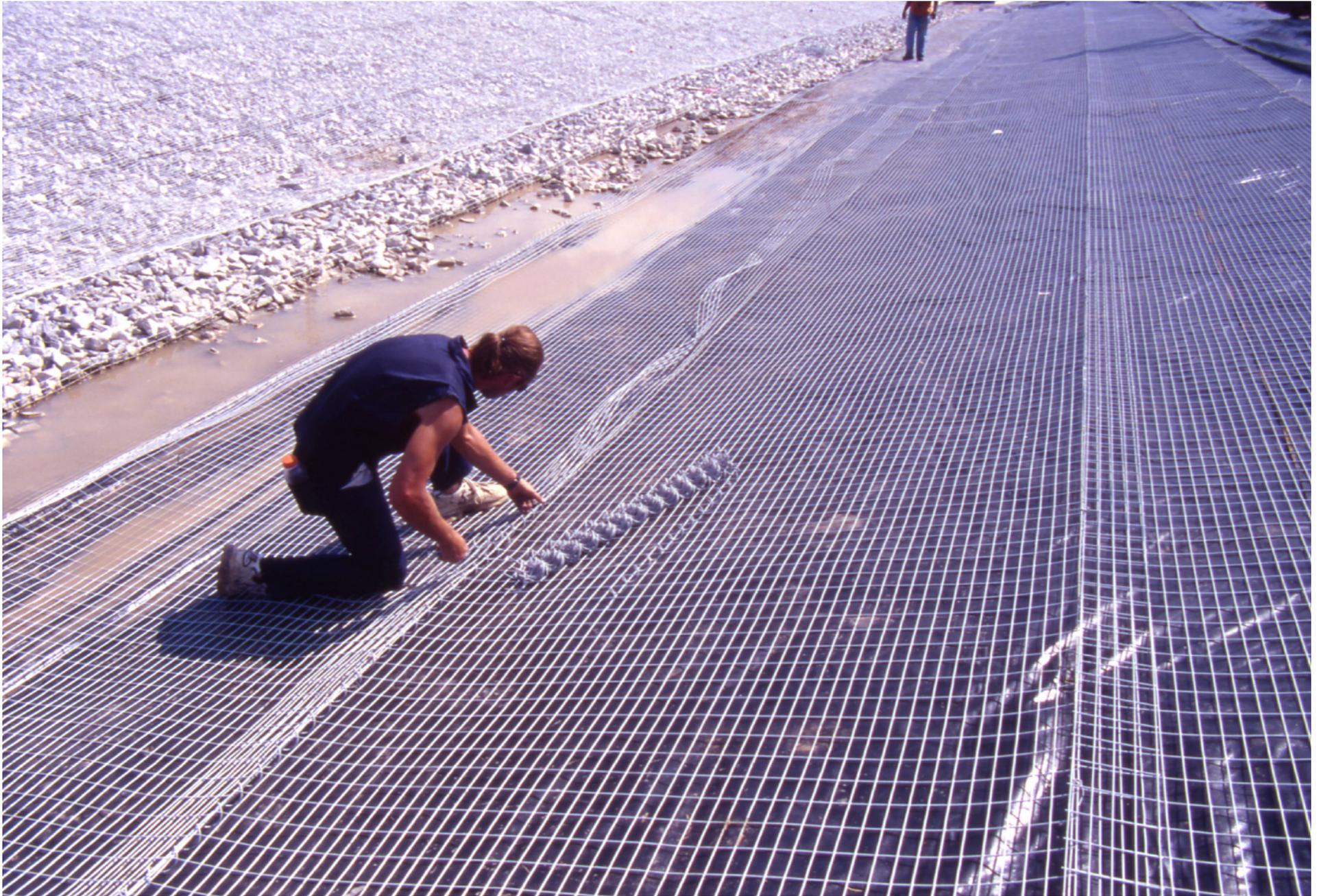
GABION MESH BEING UNROLLED OVER GEOTEXTILE



UNROLLING CONTINUOUS DIVIDER PANEL



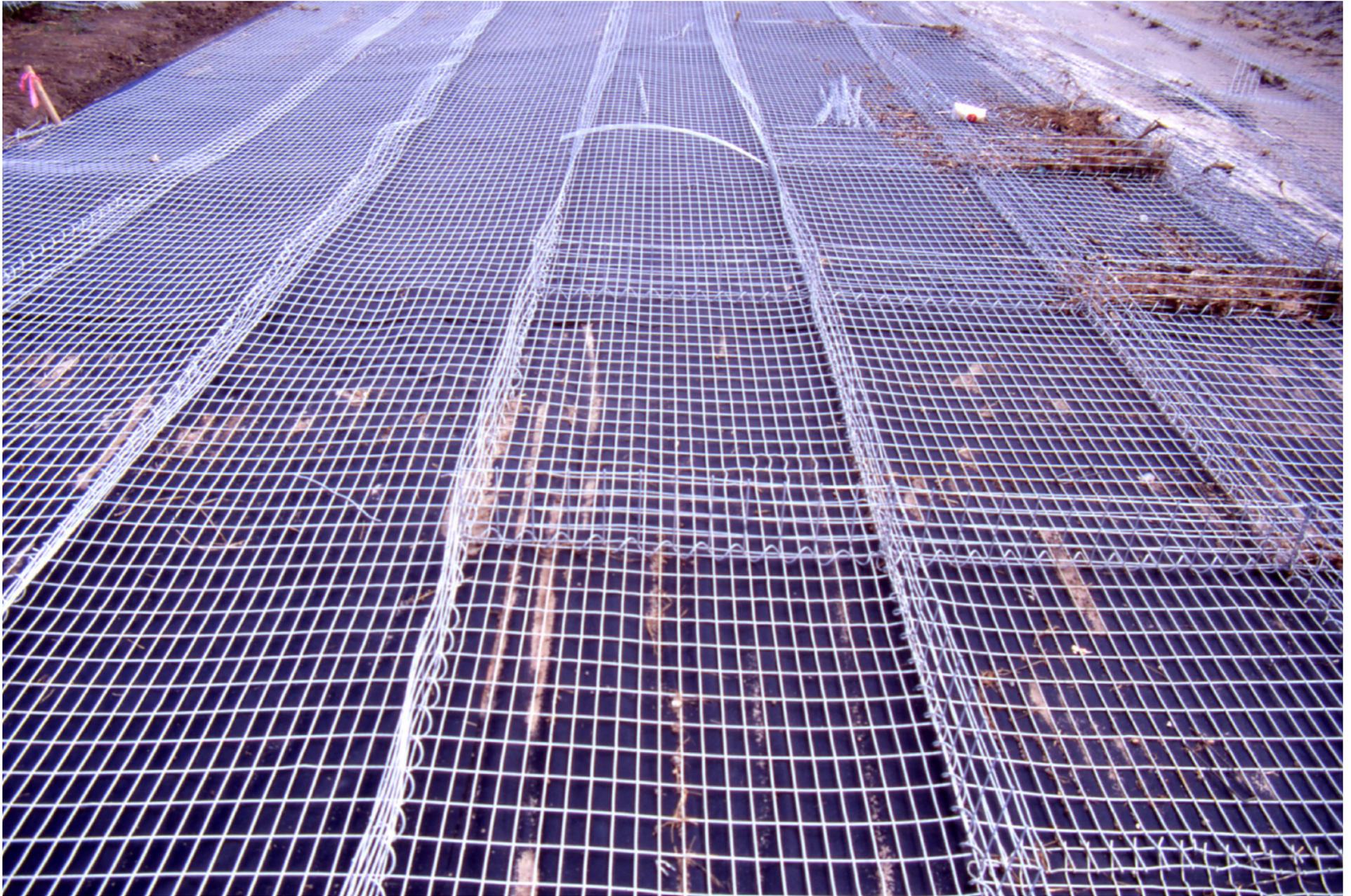
UNROLLING CONTINUOUS EDGE PANEL



SPIRAL CONNECTING DIVIDER TO BASE PANELS



DETAIL OF SPIRAL CONNECTION



SUBDIVIDING BASE INTO 6' X 3' COMPARTMENTS



DIAPHRAGMS ARE CUT FROM “ROLL-STOCK”



ROCK-FILLING THE GABION MATTRESS



WOOD FORMS PROTECT TOP OF DIAPHRAGMS



LEVELING ROCK-FILL & LID CLOSING



SPIRAL CONNECTING LIDS TO DIAPHRAGMS



JOINTLESS LIDS FROM “ROLL-STOCK”



COMPLETED SECTION OF JOINTLESS GABIONS



ALL WIRE TERMINALS PROTECTED WITH PVC



ALL WIRE TERMINALS PROTECTED WITH PVC



**PRE-CUT PANELS
TERMINALS PROTECTED WITH PVC**

MECHANICALLY STABILIZED EARTH (MSE) GABION WALLS

**48 ft. high MSE wall, constructed
from PVC coated Gabion-Faced
Welded Wire Reinforced Soil
Wall, supporting a new building.**



MSE GABION WALL COMPLETED MARCH 1998



SITE EXCAVATED-DRAIN PIPE-GRAVEL BEDDING



6' WIDE PVC "ROLL-STOCK" UTILIZED FOR SOIL REINFORCING – 3" X 3" MESH – 12 GAUGE WIRE



33' LONG X 6' WIDE PANELS CUT FROM "ROLL-STOCK" FOR BASE COURSE SOIL REINFORCING



**JOINTLESS GABION BASE COURSE ASSEMBLED
OVER SOIL REINFORCEMENT PANELS**



18" WIDE X 300' LONG "ROLL-STOCK" UTILIZED FOR JOINTLESS GABIONS CONSTRUCTION



**SPIRALS CONNECTING GABION DIAPHRAGMS
TO SOIL REINFORCEMENT GRID**



ROCK-FILLING GABIONS WITH 4" TO 8" STONE



TYPICAL MSE GABION WALL CONSTRUCTION



SOIL BACKFILL COMPACTION TO 98% PROCTOR



**WELDED WIRE MESH SOIL REINFORCING
EXTENDED TO FRONT OF GABIONS**



MSE GABION WALL ABOUT 1/2 COMPLETED



**ONE STORY BUILDING ADDITION CONSTRUCTED
TO WITHIN 6' FROM EDGE OF WALL**



48' HIGH MSE GABION WALL COMPLETED 03/1998



AERIAL VIEW OF MSE GABION WALL & BLDGS.



**MSE GABION WALL AS SEEN IN JUNE 2005,
SEVEN YEARS AFTER COMPLETION**

CONCRETE BLOCKS FACED GABION WALLS

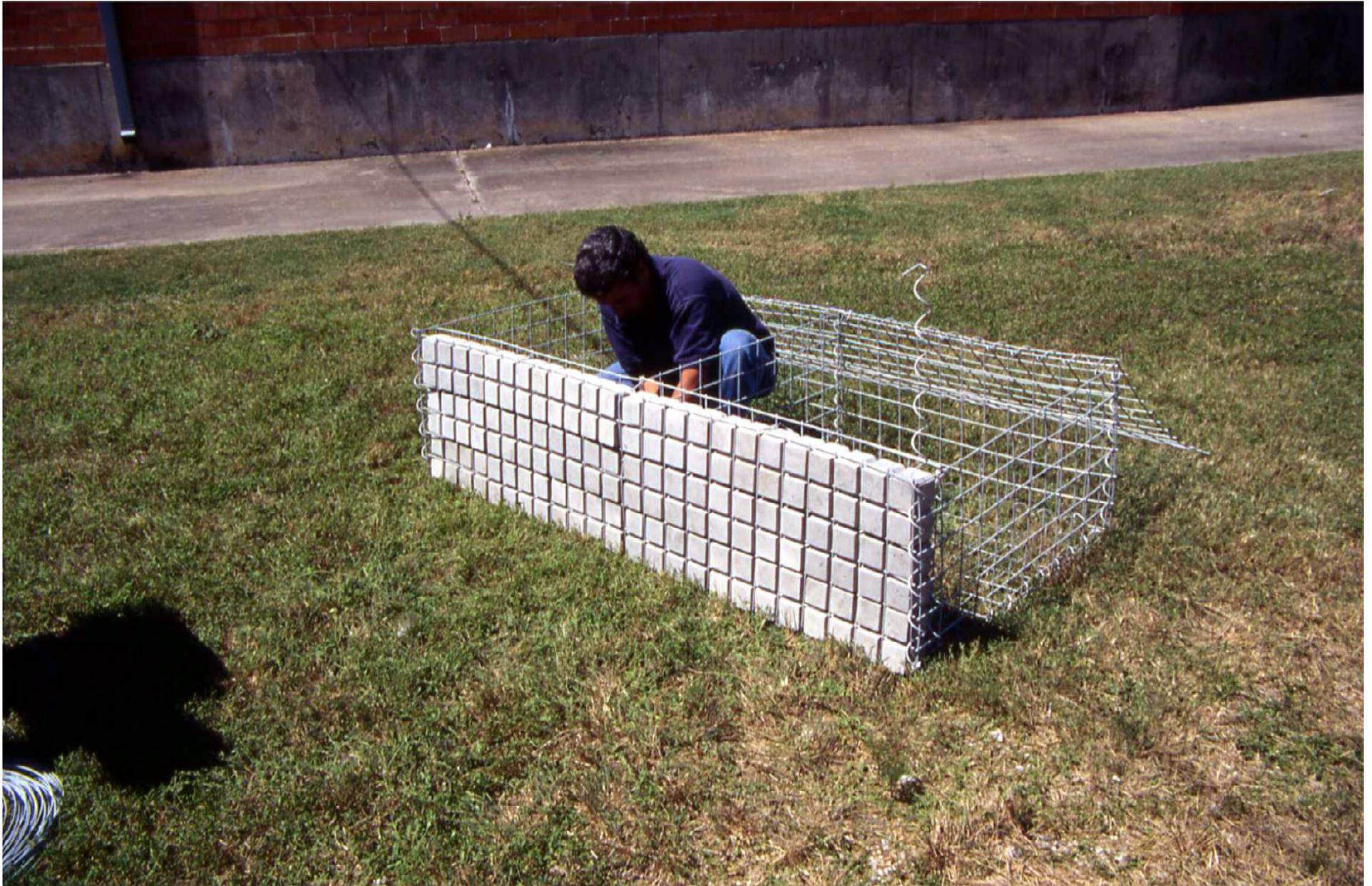
6 ft. high Gabion Walls faced with “Ragazzo Blocks” supported by a conventional 12 in. thick Gabion Mattress. All Gabion material is PVC coated after galvanizing.



CONCRETE "RAGAZZO" BLOCKS FACED GABION WALLS – QUICK CONSTRUCTION DEMO



EMPTY GABION – NOTICE THE DOUBLE WIRE MESH FACING TO HOLD THE BLOCKS



**BLOCKS PLACED BETWEEN THE TWO FRONTAL
GABION MESH PANELS**



GABIONS ARE ROCK-FILLED BEHIND THE CONCRETE "RAGAZZO" BLOCKS FACING



**COMPLETED GABION WITH CONCRETE
BLOCKS FACING**



GABION LIDS ARE SECURELY CLOSED



**CONCRETE BLOCKS FACED GABION WALLS
PROJECT AT THE U.S.A. CAMPUS**



**UNIVERSITY of SOUTH ALABAMA
RESEARCH AND TECHNOLOGY PARK**

**STREET, DRAINAGE, WATER & SEWER DISTRIBUTION IMPROVEMENTS
CONSTRUCTED BY: G.A. WEST & CO., INC.**

DESIGNED BY:

**SPEAKS & ASSOCIATES
CONSULTING ENGINEERS, INC.**

**CSA GROUP, INC.
LANDSCAPE ARCHITECTS-PLANNERS**

CONCRETE BLOCKS FACED GABION WALLS



**CONCRETE “RAGAZZO” BLOCKS AND GABION
“ROLL-STOCK” MATERIAL AT JOBSITE**



**CONCRETE “RAGAZZO” BLOCK DETAIL
MEASURING 6” W. X 12” L. X 3” DEEP**



**PVC COATED GABION MATERIAL IN
“ROLL-STOCK” FORM**



12" THICK GABION MATTRESS SUPPORT FOR THE CONCRETE BLOCKS FACED GABION WALLS



ROCK-FILLING THE 12" GABION MATTRESS



12" THICK MATTRESS READIED FOR WALL BASE



TWO 3' HIGH GABION PANELS, 3" APART, TIED TO THE MATTRESS & READY FOR CONCRETE BLOCKS



FIRST TWO CONCRETE BLOCKS PLACED



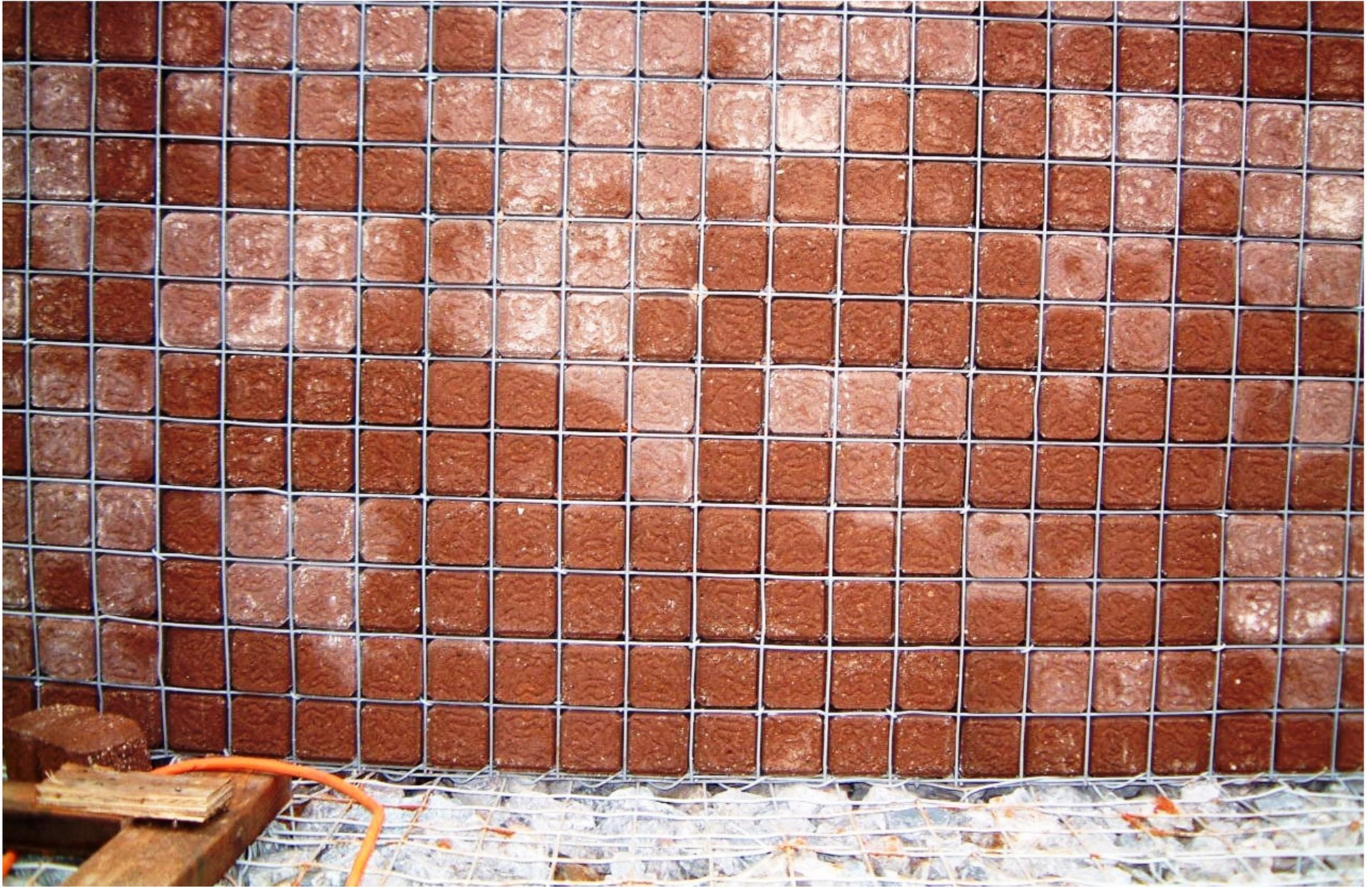
LEVELING THE CONCRETE BLOCKS FACING



CONCRETE BLOCKS PLACEMENT



CONCRETE “RAGAZZO” BLOCKS WALL FACING



**DETAIL OF GABION MESH RECESSED INTO
CONCRETE BLOCKS GROOVES**



BLOCKS CUT TO FIT CORNERS



BLOCKS CUT & SHAPED TO FIT CORNERS



**BASE COURSE GABIONS ARE ROCK-FILLED &
READY FOR HORIZONTAL BLOCKS LAYER**



**BLOCKS PLACED HORIZONTALLY
ON GABION WALL SETBACK**



**GABION MESH SECURES HORIZONTALLY PLACED
BLOCKS IN THEIR POSITION**



**TOOL DESIGNED TO RECESS GABION MESH INTO
BLOCK GROOVES**



**SHAPED WIRE CONNECTS FRONT & REAR MESH
PANELS THROUGH BLOCKS DRAINAGE HOLES**



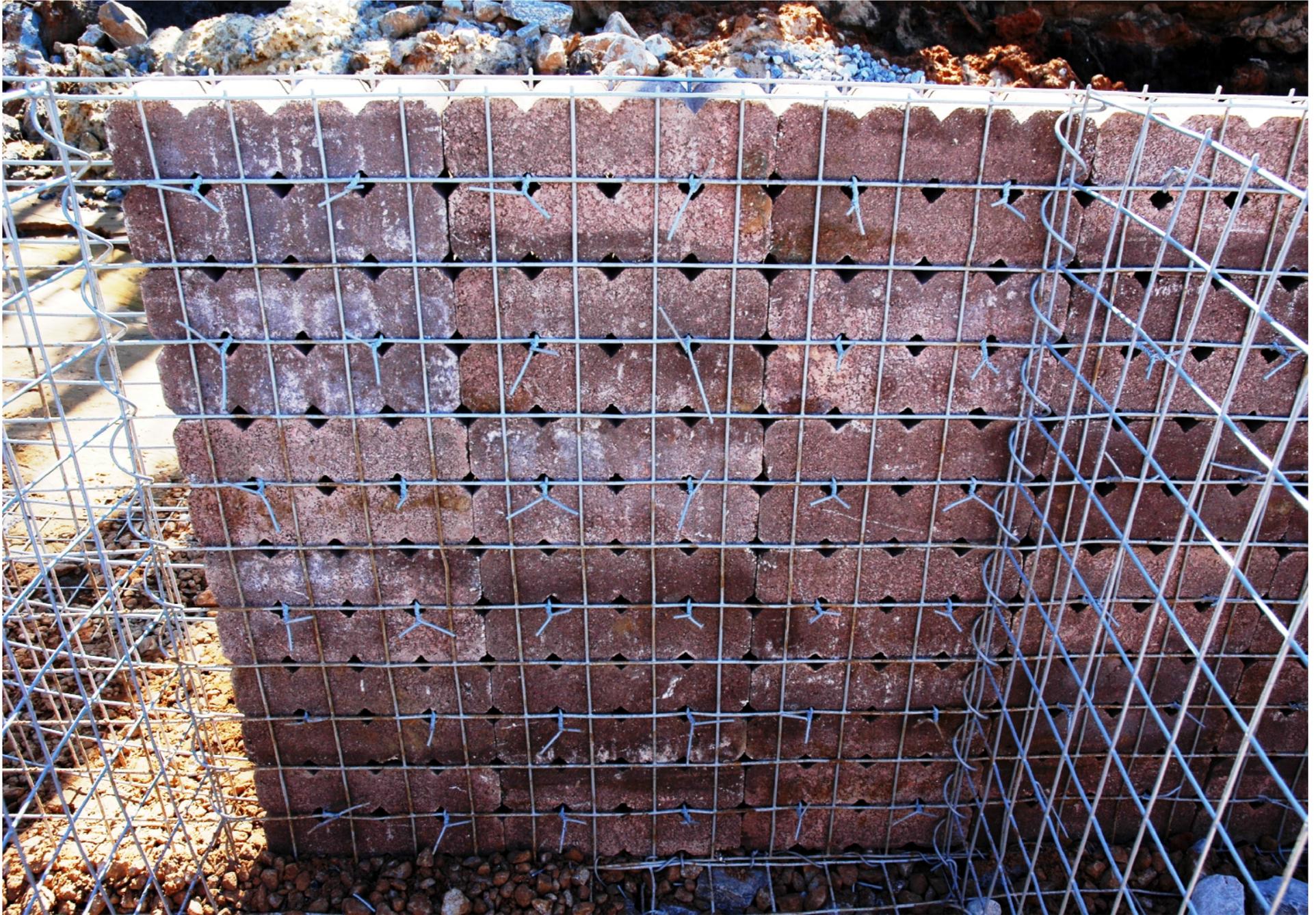
**SHAPED WIRES PLACED AT 6" O.C. THROUGH
CONCRETE BLOCKS DRAINAGE HOLES**



**SHAPED WIRE TIES FASTENED TO
REAR MESH PANEL**



TWO MAN CREW SECURES BLOCKS IN PLACE



REAR VIEW OF CONCRETE BLOCKS INSTALLED



**CORNER DETAIL OF CONCRETE “RAGAZZO”
BLOCKS FACED GABION WALL**



**SECOND TIER BLOCKS FACED GABION WALL
BEING INSTALLED**



**DETAIL OF A CONCRETE BLOCK
NOTICE THE DRAINAGE HOLES**



SPIRAL BINDERS – VERTICAL JOINTS



COMPLETED WALL SECTION



**SECTION OF CONCRETE “RAGAZZO” BLOCKS
FACED GABION WALL NEAR COMPLETION**



**SECTION OF CONCRETE “RAGAZZO” BLOCKS
FACED GABION WALL COMPLETED**

ECOMATTRESS

**12 in. thick PVC coated Gabion
Mattress partially rock filled,
saturated with top soil, seeded
and covered with a coconut
fiber mat before closing with
Gabion mesh lid.**



**GRADING THE SLOPE FOR A 12" HIGH
"ECOMATTRESS"**



PLACING GEOTEXTILE & “ROLL-STOCK” PVC MESH FOR THE ECOMATTRESS BASE



**FORMING JOINTLESS ECOMATTRESS WITH BASE
& LONGITUDINAL DIVIDER PANELS**



**3' LONG PVC SPIRAL BINDERS FASTEN
DIVIDER PANELS TO BASE PANELS**



**3' LONG PVC SPIRAL BINDERS FASTEN
TRANSVERSE DIVIDER PANELS TO BASE PANEL**



**PVC SPIRAL BINDERS FASTEN LONGITUDINAL
DIVIDERS TO TRANSVERSE PANELS**



**GEOTEXTILE PREVENTS SOIL MIGRATION
ECOMATRESS IS PARTIALLY ROCK-FILLED**



**ECOMATTRESS IS SATURATED
& LEVELED WITH TOP SOIL**



TOP SOIL SEEDED WITH SELECTED GRASS SEED



**TOP SOIL IS IRRIGATED FOR COMPACTION
TOP SOIL IS ADDED AS REQUIRED**



**WIRE TIES ARE PLACED ALONG TOP OF DIVIDERS
FOR FASTENING TO ECOMATTRESS MESH LIDS**



**COCONUT FIBER BLANKET PLACED OVER
TOP SOIL FOR GRASS GROWTH SUPPORT**



**PVC GABION MESH
SECURES TOP OF ECOMATTRESS**



ECOMATTRESS LID FASTENED TO DIVIDER'S TOP



**ECOMATTRESS IRRIGATION
HELPS GRASS SEED GERMINATION**



GRASS GROWTH BEGINS IN TWO WEEKS TIME



ECOMATTRESS GRASS CONTINUES TO GROW



A VIEW OF THE ECOMATTRESS OVER THE CONCRETE BLOCKS FACED GABION WALL



**ECOMATTRESS GIVES THE ENGINEER HIS
CHOICE OF VEGETATION GROWTH DESIRED**

STAINLESS STEEL WIRE MESH GABIONS

**UTILIZED IN MARINE WORKS,
COASTAL PROTECTION, SEA
WALLS, HEAVILY POLLUTED
WATERS AND WHEREVER
HEAVY ABRASION IS
PREVALENT**

**FAMILY CAMP SHORELINE
STABILIZATION
PATRICK AFB, FLORIDA**

Client:

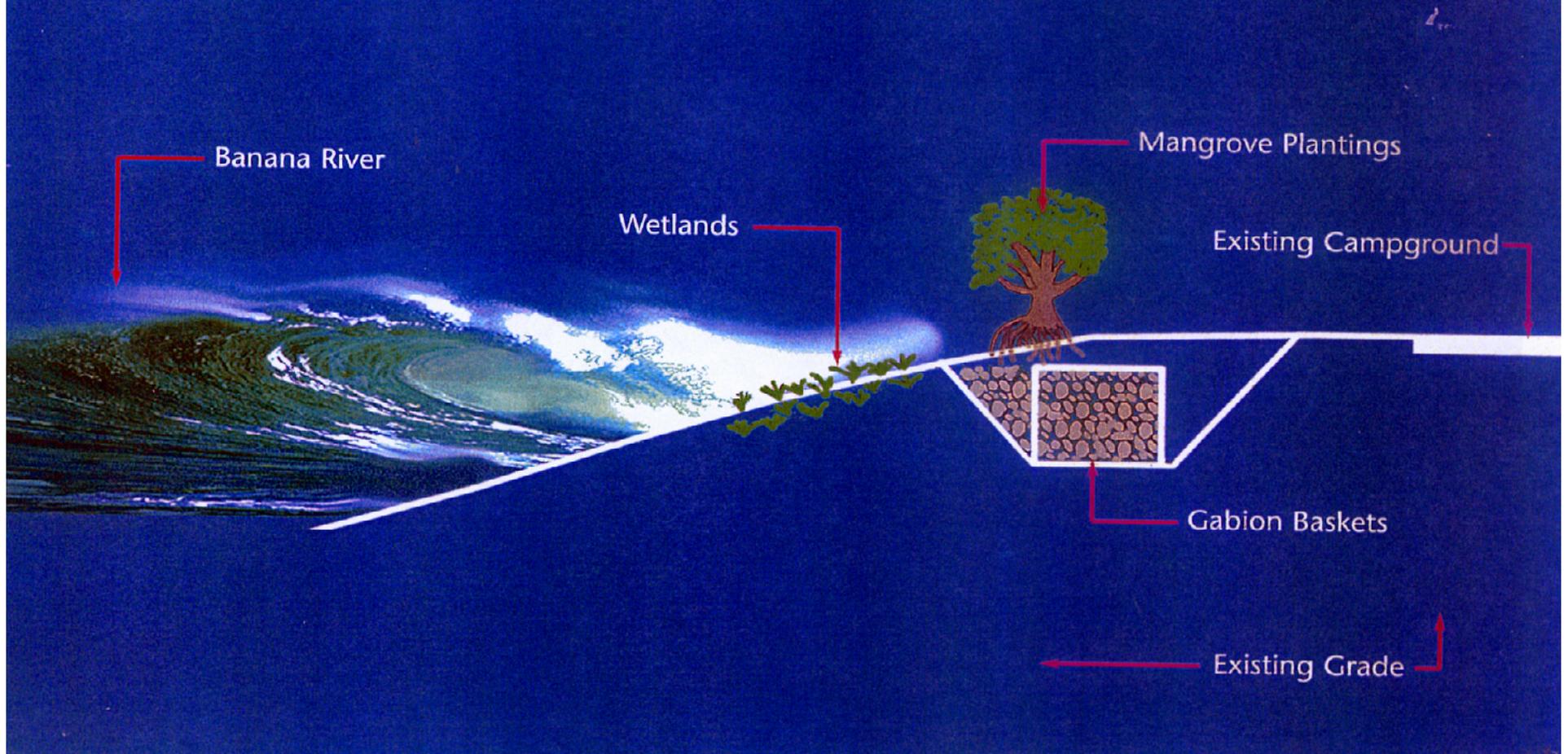
**45CES/CECC, U.S. Air Force
Patrick AFB, Florida**

Completed: June 30, 2001

Value of work for which AMEC was responsible: \$500,000

SHORELINE EROSION CONTROL

Typical Cross-Section



GABIONS ARE PLACED BELOW BEACH LEVEL



**DETAIL OF STAINLESS STEEL GABIONS PLACED
BELOW THE WATER TABLE**



GABION ROCK-FILLING



**GABION WALL WRAPPED IN GEOTEXTILE AND
PLACED BELOW THE BEACH LEVEL**



TREES TO BE PLANTED INSIDE THE SONOTUBES



**PROJECT COMPLETED – SHORELINE AND
WETLANDS PROTECTED WITH GABIONS**



STAINLESS STEEL WIRE GABION SEA WALL



**GABION SEA WALL SURVIVED CATEGORY 3
HURRICANES: IVAN 9-04 & DENNIS 7-05**



STAINLESS STEEL WIRE GABIONS AT M.I.T. CAMPUS LANDSCAPING STRUCTURES



**M.I.T. CAMPUS - S. S. GABION WALLS
CONSTRUCTION DETAIL**



**M.I.T. CAMPUS ARCHITECTURAL LANDSCAPING
S. S. GABIONS DETAIL**



**M.I.T. CAMPUS CAMBRIDGE, MA
S. S. WIRE GABIONS LANDSCAPING DETAIL**

LAND RECLAMATION PROJECT
MISSOURI DEPARTMENT
OF
NATURAL RESOURCES
LAND RECLAMATION COMMISSION

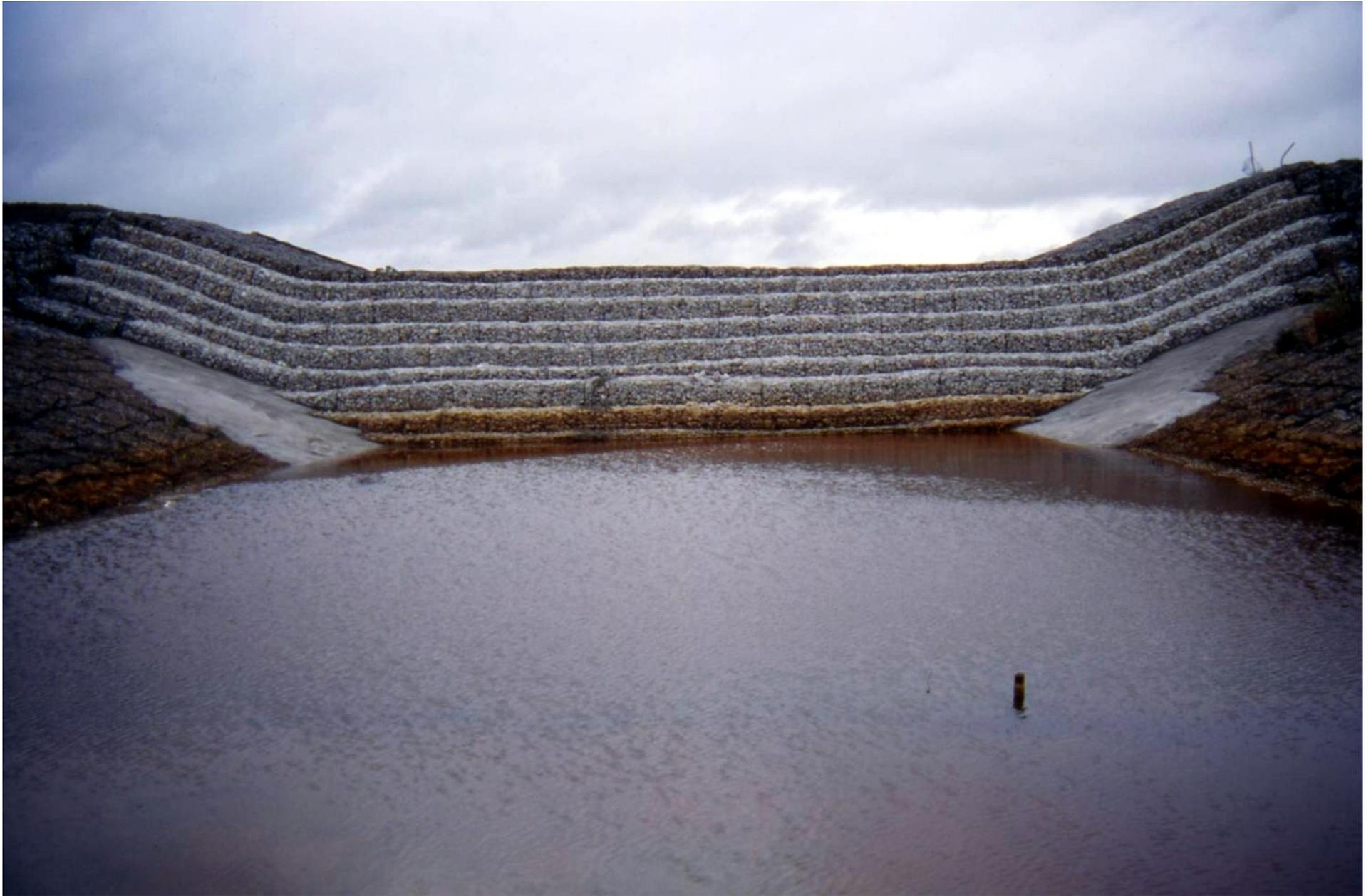




**GABION WEIR STEPS REPLACED WITH STAINLESS
STEEL WIRE MESH DUE TO SOIL ABRASION**



NEW S. S. WIRE GABION WEIR REPLACING THE PREVIOUS ONE FAILED DUE TO SOIL ABRASION



**DOWNSTREAM VIEW OF THE NEW STAINLESS
STEEL WIRE GABION WEIR**



**AUDUBON LAKE BIRD SANCTUARY
GABION BREAKWATERS BUILT AROUND ISLANDS**

**OTHER GABION PROJECTS
CONSTRUCTED WITH
“ROLL-STOCK”
CONTINUOUS
JOINTLESS
GABIONS**

BANK STABILIZATION - CAPE MAY CANAL, NEW JERSEY USA – U.S. ARMY CORPS OF ENGINEERS







GABION MATTRESS UNDERWATER PLACEMENT



MEMPHIS AIRPORT – HURRICANE CREEK



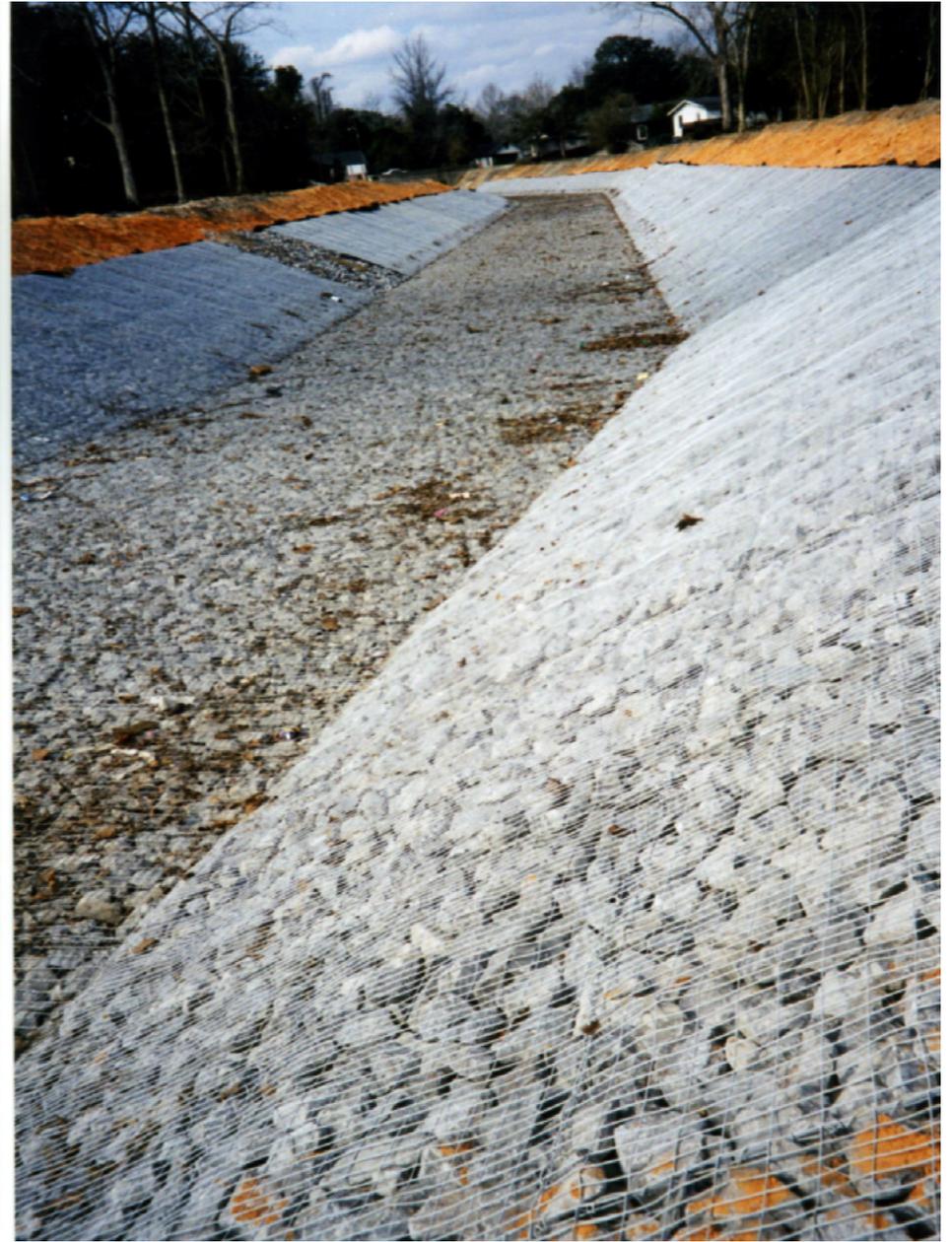
TYPICAL GABION WALL



TOMBIGBEE RIVER – BANK PROTECTION



DIVERSION DAM PECOS RIVER



NALL STREET - GABION CHANNEL LINING



MOUNTAIN BROOK – GOLF COURSE



SPRING CREEK - FLOOD CONTROL



SAN MARCOS RIVER – LULING, TX

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