

ArtWeld Gabion Standard Submittal Documents

For: 11 Gauge
Class III
Galvanized 3"x3"
Welded Wire
Mesh



- Sample Certification
- Product Specification
- Standard Drawing

Click to jump to section

- Construction Guide
- Product Warranty



CERTIFICATE OF COMPLIANCE

Weld Wire Fabric

Tree Island Steel
3933 Boundary Road,
Richmond, BC
Canada V6V 1T8

Ship Date	02/26/19	Invoice#		Sales Order#	1394011
Customer	110903	Hilfiker Pipe Company		Purchase Order#	12653
Item Code	17438	Quantity	13	Unit of Measure	RL
Mesh Description	G/M 3x3 - 11/11				
	72" x 400' Galv				

Wire Test:

Specification	Long Wire	Cross Wire
Nominal Diameter(in)	0.1200	0.1200
Minimum Ultimate Tensile(ksi)	75	75
Weight of Coat Zn(ozfs)	0.85	0.85

Typical Steel Chemical Analysis

Carbon %	Manganese %	Silicon %	Phosphorus %	Sulphur %
.17 - .22	.50 - .80	.10 - .25	.035 max	.035 max

Declaration:

The material supplied meets or exceeds requirements for physical properties of the following standards:
ASTM References.

ASTM A641 Class 3 Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire

ASTM A1064-17 Standard Specification for Steel Wire and Welded Wire Reinforcement, Plain and Deformed,
for Concrete

Tree Island Steel operates to a quality system certified to the ISO9001 standard. The quality system is based on providing repetitive, consistent practices that are designed and maintained to ensure products meet customer's specifications.

Prepared by : Shipping

Date : Feb 26, 2019



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	72" x 400' Galv				

Weld Shear Strength Data:

Shear Minimum (lbf)		600	600	600	600
Test Results					
1	01/28/19	906	882	751	941
2	01/28/19	764	683	824	774
Minimum		764	683	751	774
Maximum		906	882	824	941
Average		835	783	788	858

Tree Island Steel operates to a quality system certified to the ISO9001 standard. The quality system is based on providing repetitive, consistent practices that are designed and maintained to ensure products meet customer's specifications.

Prepared by : Shipping

Date : Feb 26, 2019



ArtWeld Gabion Product Specification (Galvanized, 11 Gauge Wire)

1.0 DESCRIPTION

This work shall consist of Hilfiker ArtWeld Gabions (welded wire mesh) and filling the gabions with rock in accordance with the details shown on project plans and special provisions.

2.0 MATERIALS

Gabions shall be of a single unit construction. The base, ends, sides, and lid shall be either welded into a single unit or shall be connected in such a manner that strength and flexibility at the connection are at least equal to that of the wire mesh. The gabions shall be fabricated in such a manner that they can be assembled at the construction site with Spiral Binders and pre-formed stiffeners into rectangular baskets of the specified size.

The height, length, and width of the gabions shall not vary more than 5 percent from the dimensions shown on the plans.

Gabions shall be divided into cells of equal length, not more than 3 feet long, by diaphragms made of the same wire mesh as used for the gabion body. Each gabion shall be fabricated with the necessary diaphragm or diaphragms secured in proper position on the base in such a manner that no additional tying at the base will be necessary.

Wire for the manufacture and assembly of gabions shall **meet or exceed** any combination of the following requirements:

<u>Description</u>	<u>Requirement</u>
3"x3" (7.62 cm x 7.62 cm), 11 Ga. - 0.116 in. min. (2.95 mm) Welded Wire Fabric	ASTM, A1064, A370 <i>Exception: Weld Shear at 600 lbf min.</i>
Galvanization: (9 Ga. 0.90 oz/SF)	ASTM A641, A90
9 Ga. Galvanized Pre-Formed Stiffener	N/A
9 Ga. Galvanized Spiral Binder - min. 0.144 in. (3.66 mm)	ASTM A641, A90
13.5 Ga. Tie Wire - min. 0.086 in. (2.2 mm) Galvanized 0.70 oz/SF	ASTM A641, A90

3.0 ROCK

Rock for filling the gabions shall be as listed:

100% passing 8 inches (20.3 cm), 0-5% passing 4 inches (10.2 cm)

4.0 CONSTRUCTION

Gabions shall first be assembled individually as empty units. Each gabion shall be manufactured with the necessary panels, properly spaced and secured, so they can be rotated into position at the construction site with no additional tying of the rotation joint. The panels and diaphragms shall be rotated into position and joined along vertical edges.

When 13.5-gauge tie wire is used as the joint material, all vertical edges of each gabion panel shall first be constructed to form individual empty gabions. Simple spiraling (looping without locking) of 13.5-gauge tie wire is not permitted. For welded-mesh, the joint shall be constructed using alternating single and double half hitches (locked loops) in every mesh opening along the joint.



When 9-gauge spiral binders are used, the spiral shall be screwed into position such that it passes through each mesh opening along the joint. Both ends of all 9-gauge spiral binders shall be crimped to secure the spiral in place.

Temporary fasteners may be used to hold panels wherever gabions-to-gabion joints will be constructed. Temporary fasteners may remain in place.

4.1 Assembly of Successive Gabions (Gabion-to-Gabion Joints)

Empty gabions shall be set in place. Individually constructed empty gabions shall be joined successively to the next empty gabion with 13.5-gauge tie wire or 9-gauge spirals, before filling with rock begins. The 13.5-gauge tie wire or 9-gauge spiral binders shall secure, in one pass, all selvage or end wires of panels of all the adjacent gabions along the joint.

4.2 Assembly of Multiple Layered Gabions

Multi-layered gabion configurations can be stepped and staggered as shown on the plans or as directed by the Engineer. When constructing multi-layered gabion configurations, each layer of gabions can be joined to the underlying layer along the front and ends, or as shown on the plans.

4.3 Assembly of Single-Layered Gabions

Single-layered gabion configurations shall be butted and joined along the front, back, and ends as shown on the plans, including tops and bottoms of adjacent gabions.

4.4 Assembly of Shear Key Gabions

Shear key gabions (also called "counterforts") shall be spaced as shown on the plans. Shear key gabions shall be tied to adjacent gabions in the manner specified for "Assembly of Successive Gabions."

4.5 Modified Geometry

To match the geometry of the planned gabion configuration, or to meet specific conditions panels shall be folded, cut, and/or re-tied to dimensions shown on the plans or as approved by the Engineer.

4.6 Filling with Rock

Rock shall be placed in gabions to insure proper alignment, avoid bulges, and provide a minimum of voids. All exposed rock surfaces shall have a smooth and neat appearance. No sharp edges shall project through the wire mesh.

When constructing with 1.5-foot high or 3-foot high gabions, pre-formed stiffeners shall be used to produce a flat, smooth external surface.

Pre-formed Stiffeners shall be installed on the exposed face of the gabion prior to rock placement, two rows at 1/3 points on 3' high gabions, one row at 1/2 point in 1.5' high gabions.

When filling 3-foot high gabions, rock shall be placed in 3 nominal 12-inch layers; when filling 1.5-foot high gabions, rock shall be placed in two 9-inch layers.

The last layer of rock shall slightly overfill the gabions such that the lid will rest on rock when it is closed.



HILFIKER RETAINING WALLS

*Welded Wire Wall • Eureka Reinforced Soil
Gabion Faced M.S.E. • Reinforced Soil Embankment
ArtWeld Gabions • Spiralnail • Steepened Slope • Trinity Wall*

4.7 Closure of Lids

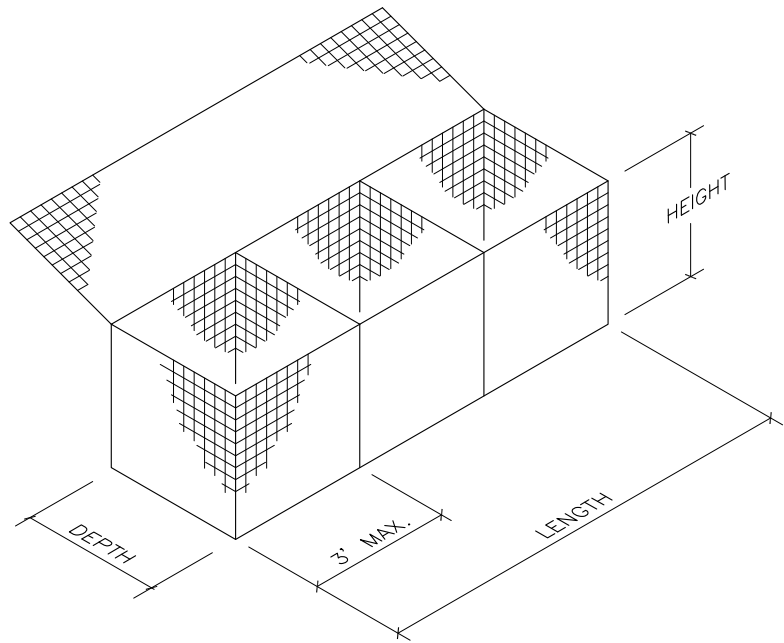
Lids shall be tied along the front, ends, and diaphragms of individual gabions and to successive gabions with 9-gauge spiral binders in the same manner as specified elsewhere in this specification.

5.0 MEASUREMENT

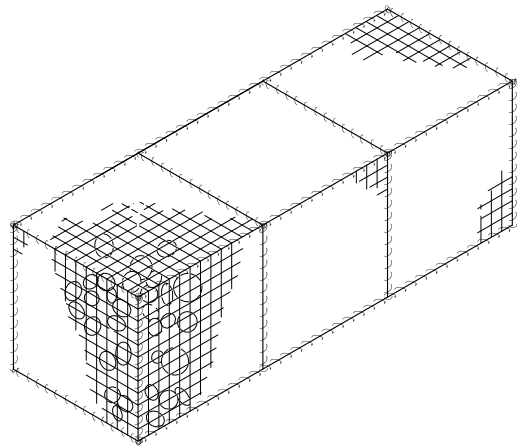
Quantities of gabions to be paid for will be measured by the cubic yard and will be determined from the dimensions shown on the plans or the dimensions directed by the Engineer.

• End of Section •

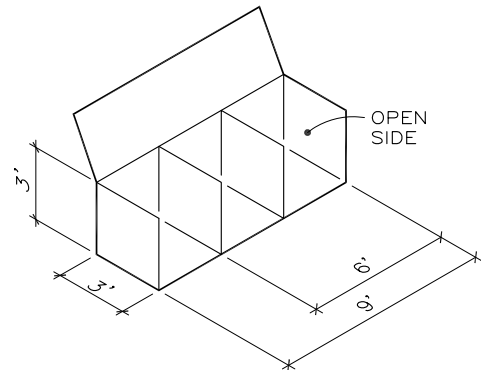
STANDARD GABION DETAILS



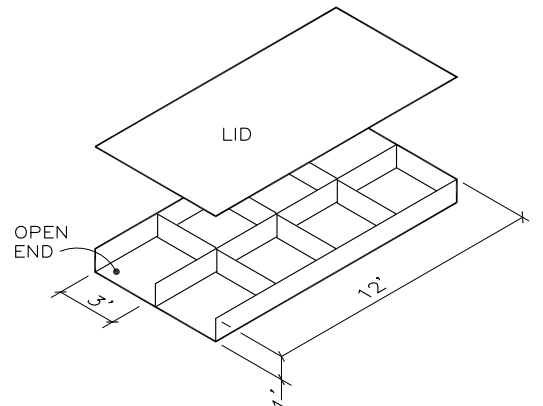
TYPICAL GABION
NOT TO SCALE



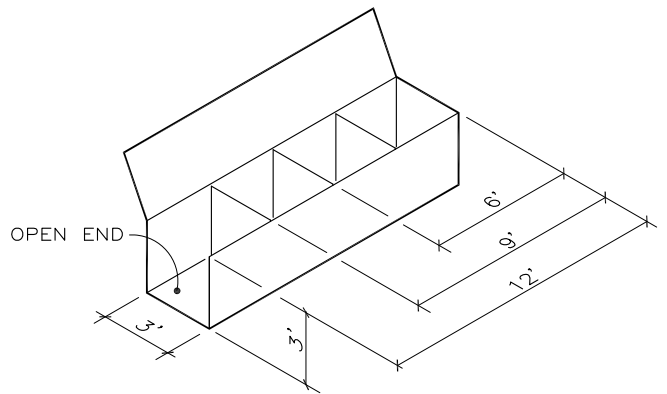
TYPICAL ASSEMBLED GABION
NOT TO SCALE



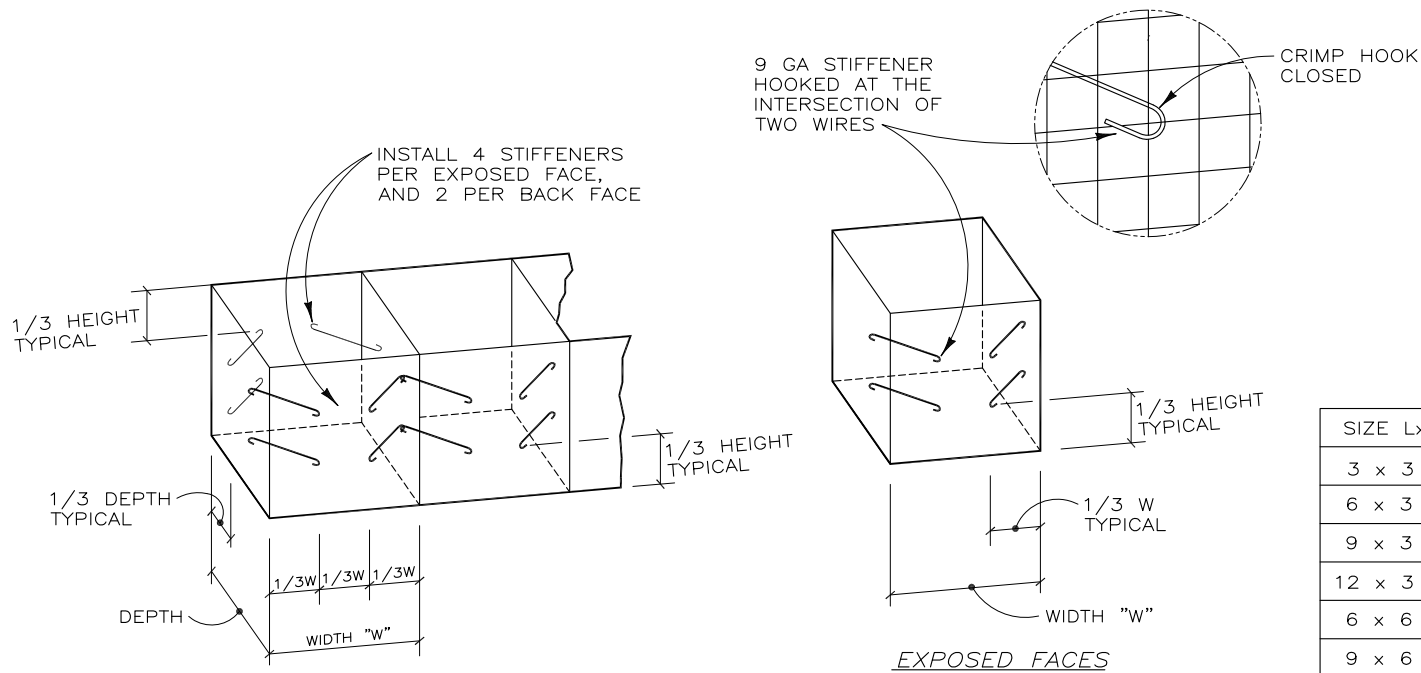
NOTE: SIZES CAN VARY
TYPICAL OPEN SIDE
NOT TO SCALE



NOTE: SIZES CAN VARY
TYPICAL MATTRESS
NOT TO SCALE



NOTE: SIZES CAN VARY
TYPICAL OPEN END
NOT TO SCALE



WHERE HEIGHT OF GABION IS 18" OR LESS, INSTALL 2 STIFFENERS PER FACE
WHERE HEIGHT IS 12", NO STIFFENERS REQUIRED

END CELLS

STIFFENER DETAILS
NOT TO SCALE

STANDARD GABION SIZES

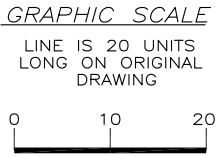
SIZE LxWxH	CU.YD.	SIZE LxWxH	CU.YD.	SIZE LxWxH	CU.YD.
3 x 3 x 3	1	3 x 3 x 1.5	0.5	3 x 3 x 1	0.33
6 x 3 x 3	2	6 x 3 x 1.5	1	6 x 3 x 1	0.67
9 x 3 x 3	3	9 x 3 x 1.5	1.5	9 x 3 x 1	1
12 x 3 x 3	4	12 x 3 x 1.5	2	12 x 3 x 1	1.33
6 x 6 x 3	4	6 x 6 x 1.5	2	6 x 6 x 1	1.33
9 x 6 x 3	6	9 x 6 x 1.5	3	9 x 6 x 1	2
12 x 6 x 3	8	12 x 6 x 1.5	4	12 x 6 x 1	2.67
24 x 6 x 3	16	24 x 6 x 1.5	8	24 x 6 x 1	5.33

NOTES

- GABION SIZES ARE EXPRESSED IN FEET.
- MATTRESSES AND CUSTOM SIZES PROVIDED ON REQUEST.
- GABIONS WHICH ARE TO BE CONNECTED TOGETHER SIDE-TO-SIDE OR END-TO-END, MAY BE PROVIDED OPEN-SIDED OR OPEN-ENDED AS SHOWN TO REDUCE WEIGHT, COST, AND ASSEMBLY TIME.
- GABIONS ARE MANUFACTURED OF 3"x3" WELDED WIRE MESH, WIRE SIZE AND FINISH VARIES;
9 GA. BRITE BASIC (BLACK)
9 GA. WITH 0.9 OZ/SF ZINC COATING
11 GA. WITH 0.85 OZ/SF ZINC COATING.
OPTIONAL 2.0 OZ/SF ZINC COATING IS AVAILABLE ON REQUEST.

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REV.NO.	DATE	BY	DESCRIPTION
1	16 JUN 98	DR	REVISED ZINC COATING THICKNESS
2	12 APR 02	DR	UPDATED BORDER
3	15 NOV 06	AMJ	UPDATED BORDER, MINOR CHANGES
4	11 NOV 07	JTE	MINOR CHANGES



PROJ.MGR.

ENGINEER

CADD BY
HRW

HILFIKER RETAINING WALLS

1902 Hilfiker Lane
Eureka, CA 95503-5711
TOLL-FREE 800.762.8962
PH 707.443.5093 FAX 707.443.2891
WEBSITE www.hilfiker.com E-MAIL info@hilfiker.com

DWG DATE
17 JUL 95

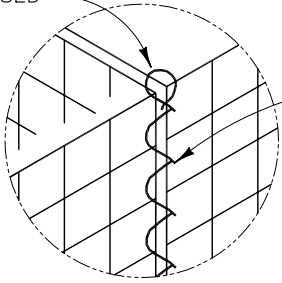
REVISION DATE
11 NOV 07

SCALE
NOTED

STANDARD DRAWING	PROJECT NO.
ARTWELD GABIONS	SHEET 1
DETAILS AND NOTES	OF 2

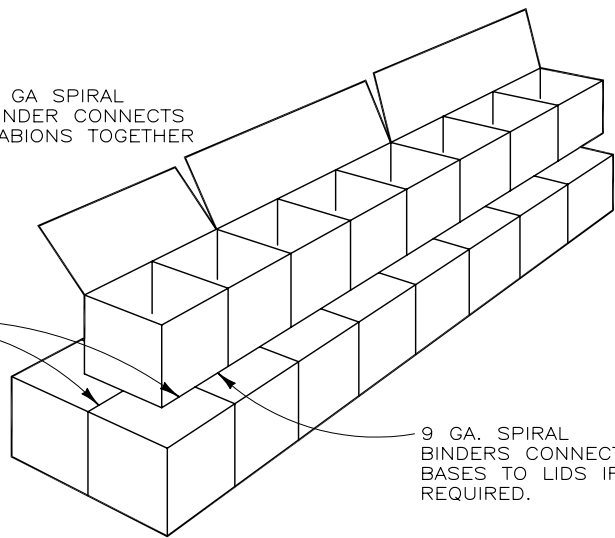
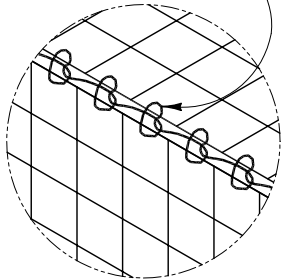
STANDARD GABION DETAILS

CRIMP ENDS OF SPIRAL CLOSED



9 GA SPIRAL BINDER CONNECTS GABIONS TOGETHER

OPTIONAL 13 GA TIE WIRE, ONE HITCH AT 3" SPACING

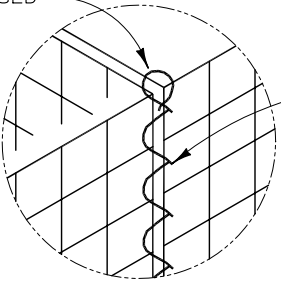


9 GA. SPIRAL BINDERS CONNECT BASES TO LIDS IF REQUIRED.

ASSEMBLY DETAILS - STEP FACE WALL

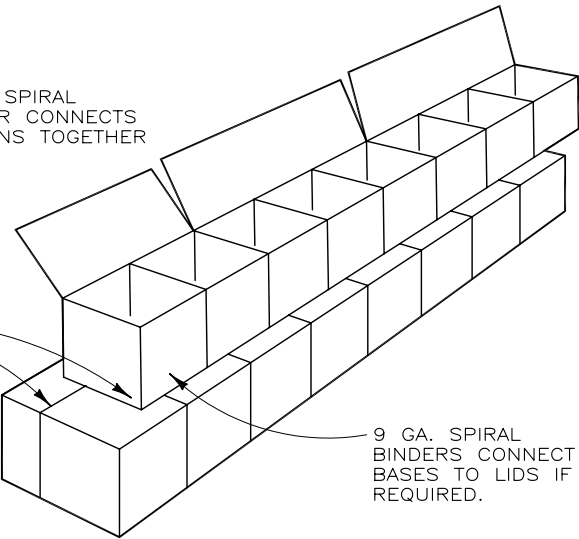
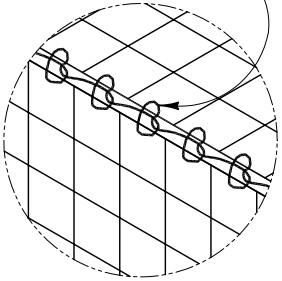
NOT TO SCALE

CRIMP ENDS OF SPIRAL CLOSED



9 GA SPIRAL BINDER CONNECTS GABIONS TOGETHER

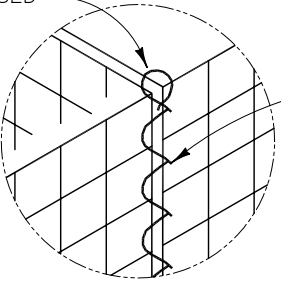
OPTIONAL 13 GA TIE WIRE, ONE HITCH AT 3" SPACING



9 GA. SPIRAL BINDERS CONNECT BASES TO LIDS IF REQUIRED.

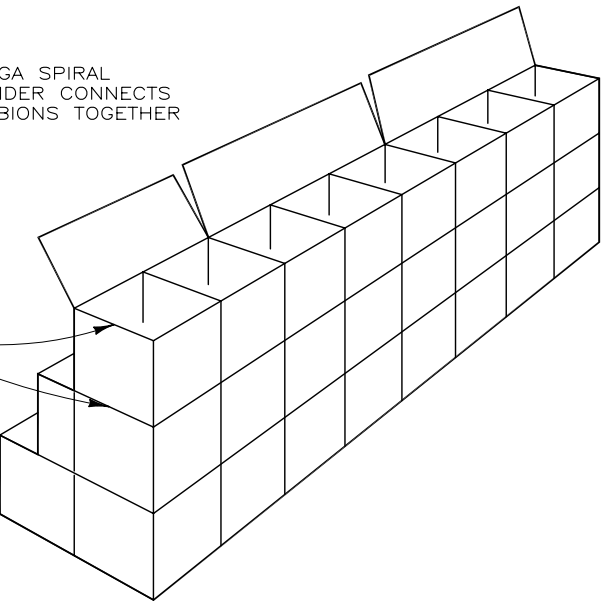
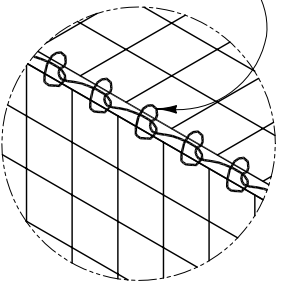
ASSEMBLY DETAILS

CRIMP ENDS OF SPIRAL CLOSED



9 GA SPIRAL BINDER CONNECTS GABIONS TOGETHER

OPTIONAL 13 GA TIE WIRE, ONE HITCH AT 3" SPACING

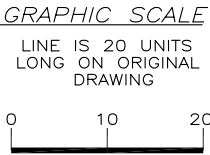


ASSEMBLY DETAILS - VERTICAL WALL

NOT TO SCALE

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1	6/16/98	DR	REVISED ZINC COATING THICKNESS
2	4/12/02	DR	UPDATED BORDER
3	15 NOV 06	AMJ	UPDATED BORDER, MINOR CHANGES
4	11 NOV 07	JTE	MINOR CHANGES



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ENGINEER
CADD BY
HRW

HILFIKER RETAINING WALLS
**HW**

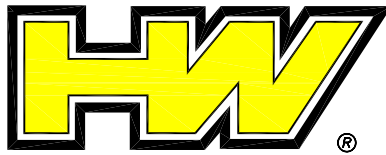
1902 Hilfiker Lane
Eureka, CA 95503-5711
TOLL-FREE 800.762.8962
PH 707.443.5093 FAX 707.443.2891
WEBSITE www.hilfiker.com E-MAIL info@hilfiker.com

**1902**
QUALITY PRODUCT

DWG DATE
MAY 08
REVISION DATE
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STANDARD DRAWING	PROJECT NO.
ARTWELD GABIONS	SHEET 2 OF 2
DETAILS AND NOTES	

ARTWELD GABIONS & GABION FACED M.S.E. Construction Guide



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Toll Free (800)762-8962

Web: <http://hilfiker.com> email: info@hilfiker.com



SCAN TO VISIT OUR WEBSITE

The **ArtWeld Gabion** is named for our friend and coworker, Arthur Lee Hilfiker, who originated, developed and tested the gabions before his untimely death in June 1986. Arthur's idea was to develop a gabion that was easily shipped, quickly assembled and structurally superior to conventional gabions. He succeeded admirably.

*The possible uses of **ArtWeld Gabions** are so varied that this guide can not show them all. The purpose of this guide is to detail only the assembly process. Follow your plans for the structural design and site placement.*

ArtWeld Gabions are factory cut from galvanized or non-galvanized 3" x 3" Welded Wire Mesh. The main panel components are fastened together at our facilities with galvanized clips and spiral binders. They are then folded and shipped flat to the site. No flattening, bending, stretching or folding is required in the field. The sides are simply raised and connected together with spiral binders. Because the wire is not bent, no cracking of the galvanized coating can occur. Typically, a 6' x 3' x 3' gabion takes less than 5 minutes to make ready for filling.

The strength of Welded Wire Mesh offers many advantages. It allows careful machine filling. It is easy to hold the alignment of the face. The manufacture of large gabions is possible, up to 24' x 6' x 3', meaning fewer seams to be joined in the field. Also, if a gabion must be cut to fit site conditions, the wire can be cut with bolt cutters without losing structural strength.

ArtWeld Gabions can be manufactured in conventional sizes, or custom sizes for special site conditions. Wire diameter and thickness of galvanizing, if any, can be varied to suit job requirements.

For your next gabion project, contact Hilfiker Retaining Walls for a quote on a product we are proud to manufacture. We look forward to being of service to you and your clients.

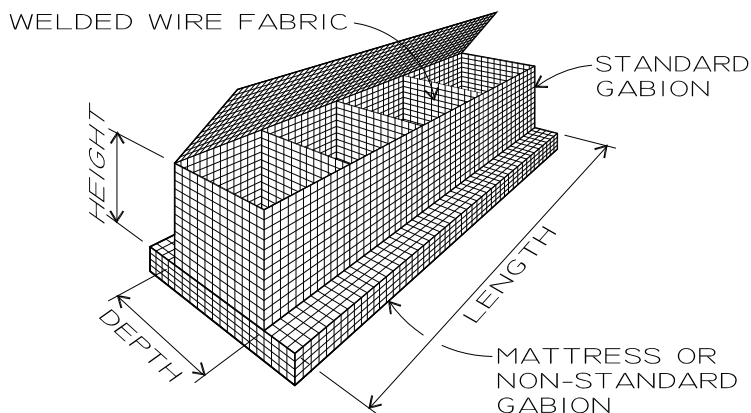
July 2014



3" = 76MM	6' = 1.83M
3' = 914MM	24' = 7.32M



ARTWELD GABIONS CAN BE MANUFACTURED IN BOTH ENGLISH AND METRIC UNITS. FOR SIMPLICITY, DIMENSIONS IN THIS GUIDE REFER ONLY TO **ENGLISH UNITS**. CONSTRUCTION METHODS FOR BOTH TYPES ARE IDENTICAL.



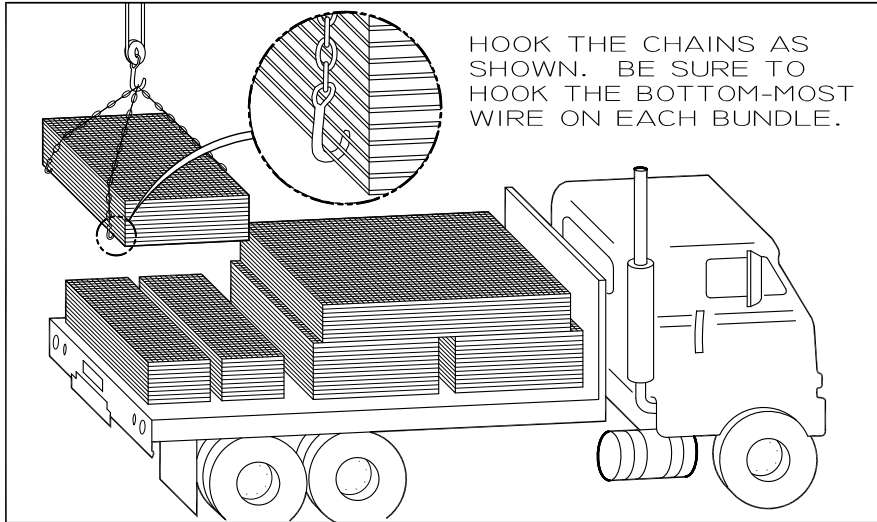
STANDARD **ENGLISH** UNIT GABIONS ARE SIZED IN MULTIPLES OF 3 FEET (0.914 METERS). THEY ARE MANUFACTURED OF 3"x3" (76MM X 76MM) WELDED WIRE FABRIC.

STANDARD **METRIC** UNIT GABIONS ARE SIZED IN MULTIPLES OF 1 METER (3.28 FEET). THEY ARE MANUFACTURED OF 83MM X 83MM (3.25" X 3.25") WELDED WIRE FABRIC.

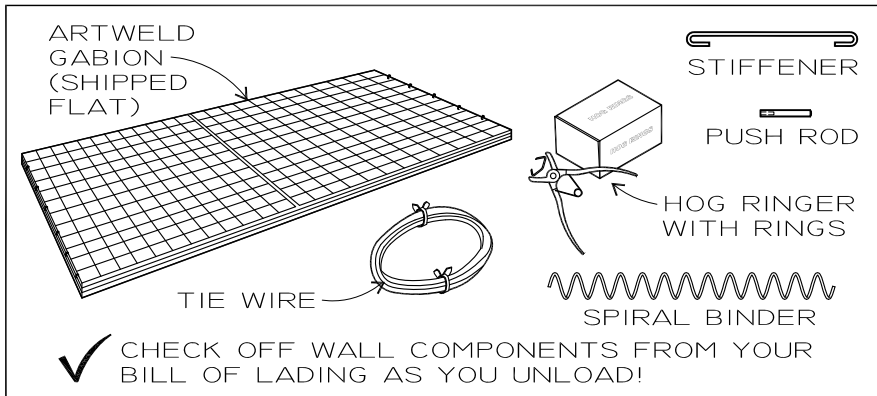
BOTH ENGLISH UNIT AND METRIC UNIT GABIONS ARE SUPPLIED IN 9 GA AND 11 GA GALVANIZED, AND 9 GA NON-GALVANIZED WELDED WIRE FABRIC.

NON-STANDARD SIZES, AND MATTRESSES, CAN BE SPECIAL-ORDERED TO FIT PROJECT REQUIREMENTS.

RECOMMENDED UNLOADING PROCEDURE

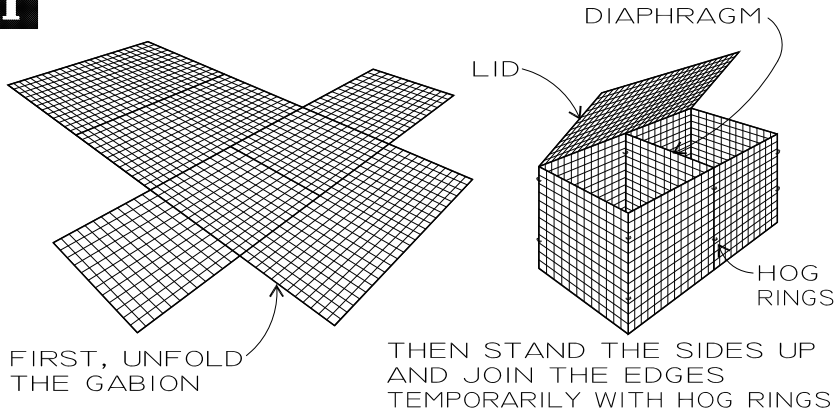


GABION PARTS (NOT TO SCALE)

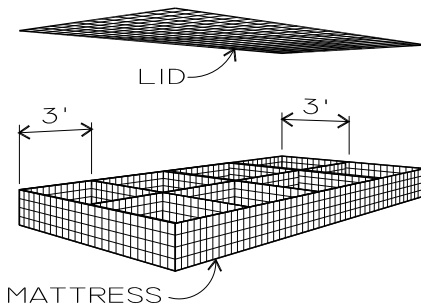


ON-SITE ASSEMBLY

1



THIS GUIDE SHOWS ASSEMBLY WITH HOG RINGS AND SPIRAL BINDERS BECAUSE THAT IS THE EASIEST AND FASTEST ASSEMBLY METHOD.



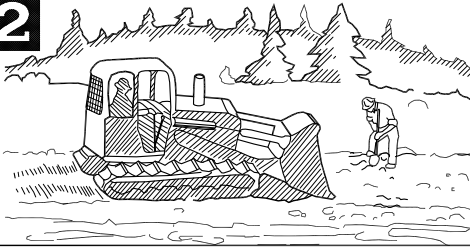
YOU MAY USE TIE WIRE AND HALF-HITCH LACING FOR ALL CONNECTIONS IF DESIRED.

HOG RINGS ARE **NOT** PERMANENT CONNECTIONS AND MUST BE FOLLOWED BY SPIRAL BINDERS OR TIE WIRE.

LIDS ARE NOT FACTORY ATTACHED ON GABIONS WIDER THAN 3'.



2

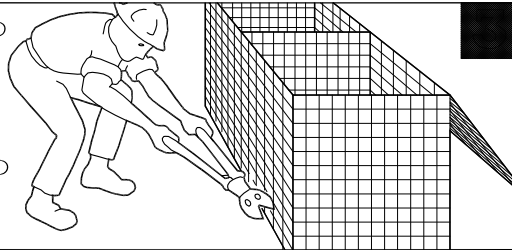


EXCAVATE AND FINE-
GRADE THE
FOUNDATION.

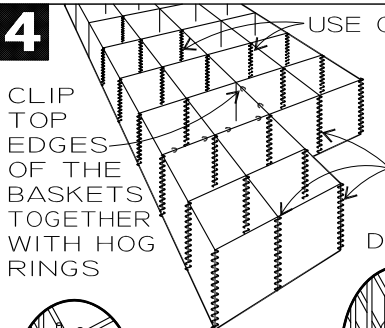
FOUNDATION MUST
BE REASONABLY
LEVEL AND
CAPABLE OF
SUPPORTING
IMPOSED LOADS

GABIONS MAY BE FIELD
CUT TO FIT CURVES,
CULVERTS OR ANGLES.

RECONNECT THE ENDS
OF THE GABIONS THE
SAME WAY YOU WOULD
ASSEMBLE AN UNCUT
GABION



4



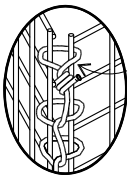
CLIP
TOP
EDGES
OF THE
BASKETS
TOGETHER
WITH HOG
RINGS

USE ONE SPIRAL
AT **EVERY**
VERTICAL
CONNECTION.

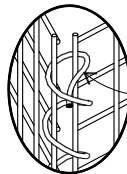
BIND ALL
EXTERIOR
CORNERS &
DIAPHRAGMS

PLACE THE FIRST
COURSE OF
GABIONS ON THE
FOUNDATION.

YOU MAY CLIP THE
SIDES TOGETHER
WITH HOG RINGS
TO HOLD THEM
TEMPORARILY.



IF YOU ARE
USING TIE
WIRE, USE
HALF-HITCH
LACING AT 3"



CRIMP
ENDS
OF ALL
SPIRAL
BINDERS

PERMANENTLY
BIND THE GABIONS
TOGETHER AS
SHOWN FOR THE
FULL HEIGHT
AT ALL CORNERS
AND DIAPHRAGMS.



STIFFENER INSTALLATION

5

BEFORE FILLING, INSTALL STIFFENERS ACROSS THE CORNERS OF THE GABIONS ON ALL EXTERIOR SIDES OF THE STRUCTURE

NO STIFFENERS IN INTERIOR CELLS

FACE OF STRUCTURE

STIFFENER

END OF STRUCTURE

1/3 (1' MAX)
1/3 (1' MAX)
1/3 (1' MAX)

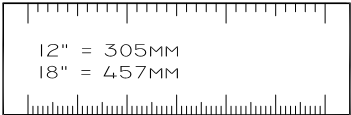
TWO ROWS OF STIFFENERS MINIMUM (4 PER CELL) ARE REQUIRED AT ALL EXTERIOR SIDES

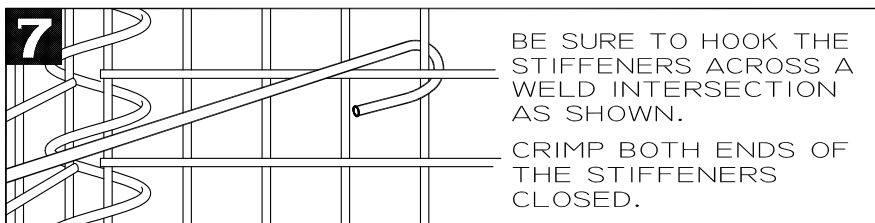
18" & 24" GABIONS REQUIRE ONLY ONE ROW OF STIFFENERS

1/2
1/2

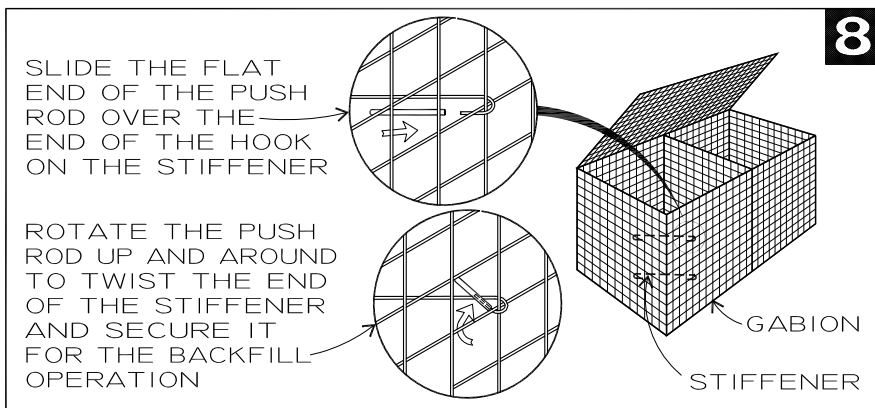
A 12" GABION DOES NOT REQUIRE STIFFENERS

12"

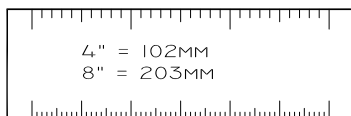
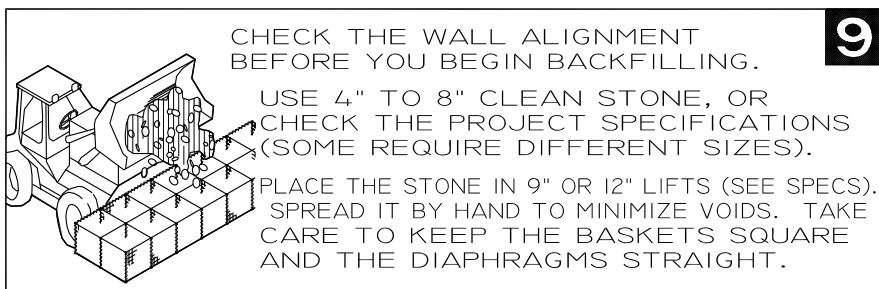




USING THE PUSH RODS

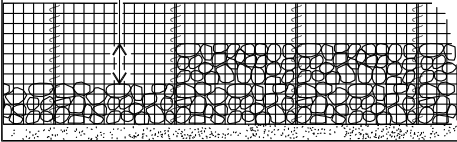


BEGIN THE FILL



10

12" MAXIMUM
RECOMMENDED



IT IS RECOMMENDED
THAT THE FILL IN ANY
CELL NEVER BE MORE
THAN 12" HIGHER
THAN THE FILL IN
AN ADJOINING CELL.

11

CONTINUE FILLING THE GABIONS
IN 12" LIFTS UNTIL THEY ARE
FILLED. FILL FLUSH OR SLIGHTLY
ABOVE THE TOP OF THE GABION.

FLUSH



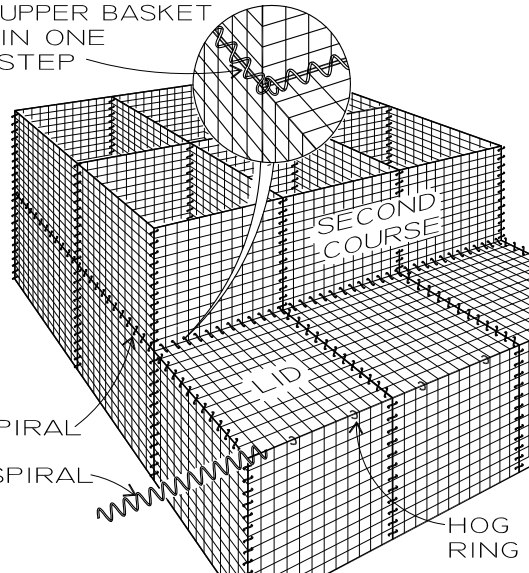
LOWER THE LIDS.
YOU MAY USE HOG
RINGS FOR
TEMPORARY
CONNECTIONS.
INSTALL SPIRALS
AT ALL PERIMETER
AND DIAPHRAGM
EDGES.

PLACE THE NEXT
COURSE OF GABIONS.
USE SPIRALS TO
PERMANENTLY BIND
THE FRONT, BACK
AND SIDES TO THE
FILLED GABIONS
OR PER THE PROJECT
SPECIFICATIONS.

REPEAT STEPS ④
THRU ⑫ TO
THE TOP OF THE
STRUCTURE.

ONE SPIRAL MAY BE USED
TO CONNECT THE LID AND
UPPER BASKET
IN ONE
STEP

12



12" = 305MM

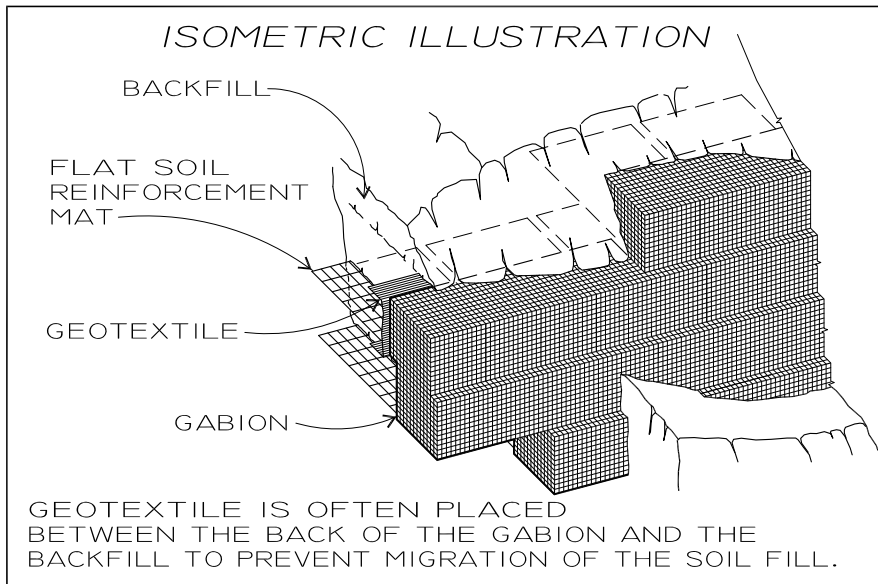
NOTES

GABION-FACED M.S.E. WALL

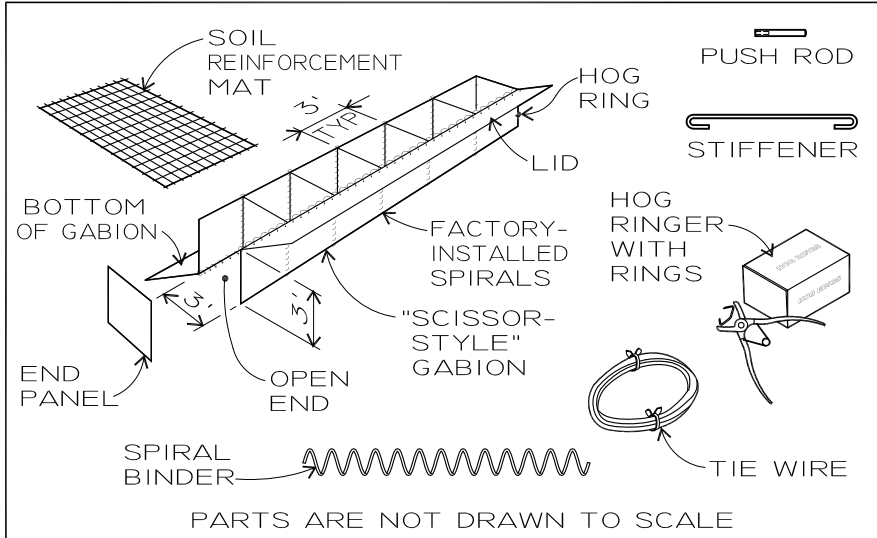
The Hilfiker Gabion Faced M.S.E. Wall combines **ArtWeld Gabions** at the face of the structure, with welded wire soil reinforcement mats spaced vertically at 3-foot intervals.

The "scissor-style" gabions are manufactured in lengths up to 18 feet. "Scissor-style" refers to the folding pattern of the gabions. They are partially pre-assembled at our factory, with the vertical edges of the diaphragms permanently connected to the vertical faces, and the lid and bottom panels connected to the main body along one long side. They are folded flat for shipment.

The wire gauge and length of the welded wire soil reinforcement mats will vary as required for each specific site.

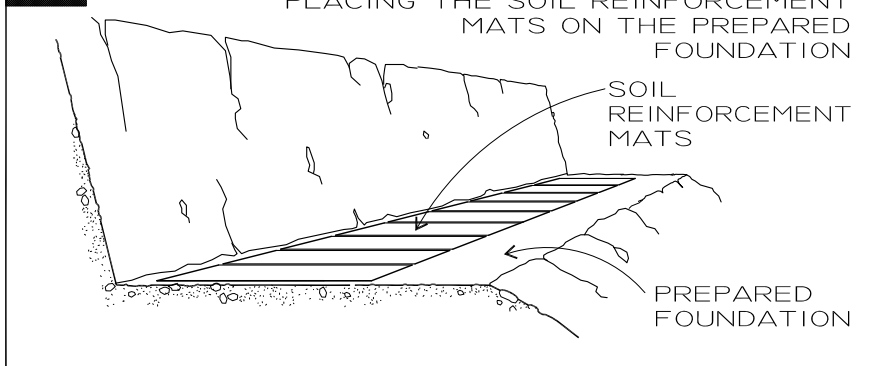


GABION FACED M.S.E. WALL PARTS



13

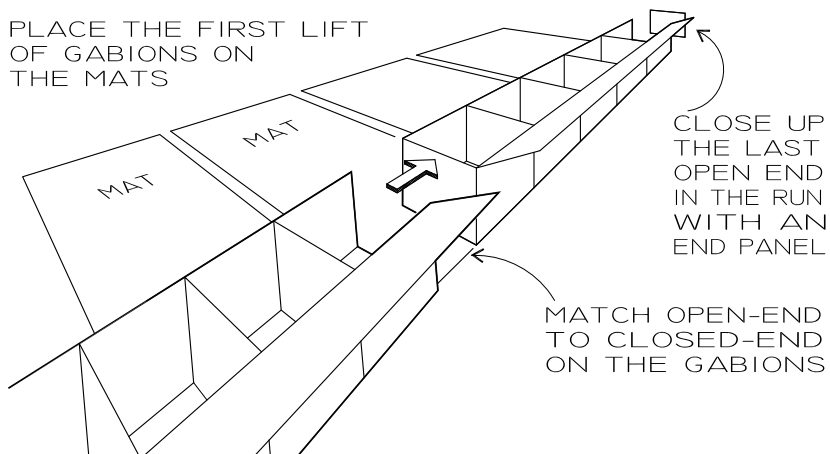
BEGIN THE GABION FACED M.S.E. WALL BY PLACING THE SOIL REINFORCEMENT MATS ON THE PREPARED FOUNDATION



14

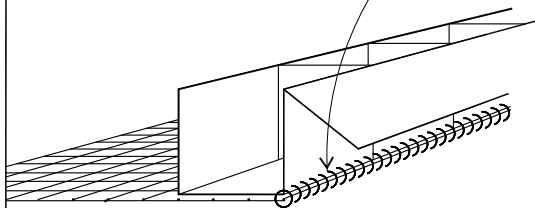
UNFOLD THE GABIONS AND CLOSE THE BOTTOM PANELS. YOU CAN CLIP THEM TEMPORARILY WITH HOG RINGS.

PLACE THE FIRST LIFT OF GABIONS ON THE MATS

**15**

LINE UP THE BOTTOM FACE OF THE GABION WITH THE FIRST TRANSVERSE WIRE ON THE MAT.

SPIRAL THE BOTTOM FACE OF THE GABION TO THE FIRST TRANSVERSE WIRE ON THE MAT

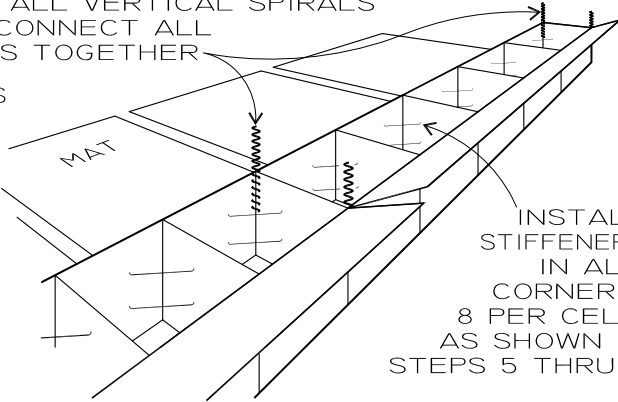
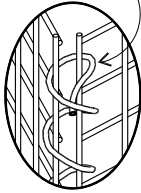


THE SPIRAL WILL PERMANENTLY CONNECT THE BOTTOM OF THE GABION TO THE FRONT, AND CONNECT THE GABION TO THE MAT IN ONE STEP

16

INSTALL VERTICAL SPIRALS
TO CONNECT ALL
ENDS TOGETHER

CRIMP ENDS
OF ALL
SPIRALS
CLOSED



INSTALL
STIFFENERS
IN ALL
CORNERS,
8 PER CELL,
AS SHOWN IN
STEPS 5 THRU 8

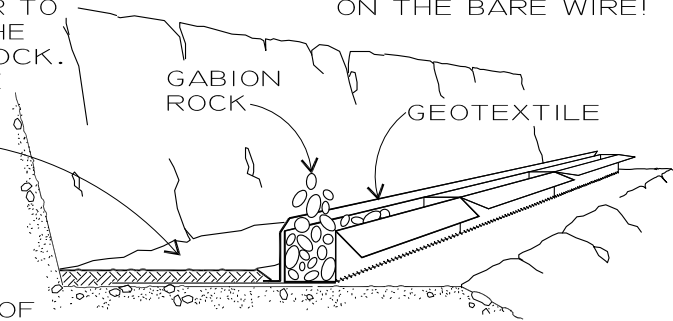
BEGIN THE BACKFILL

INSTALL GEOTEXTILE AGAINST THE
BACK OF THE GABIONS.

PLACE AND COMPACT A LIFT
OF BACKFILL OVER THE
MATS PRIOR TO
PLACING THE
GABION ROCK.
PLACE THE
THE ROCK
AS SHOWN
IN STEPS
9 TO 11.

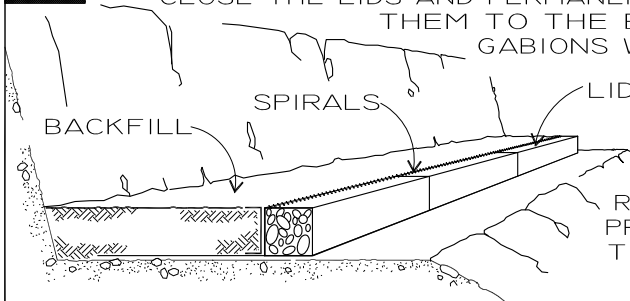
DO NOT OPERATE
HEAVY EQUIPMENT
ON THE BARE WIRE!

NEVER
BACKFILL
AGAINST
THE BACK OF
AN EMPTY BASKET

**17**

18

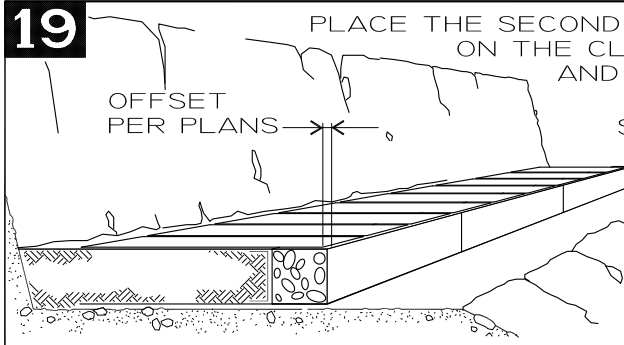
WHEN THE GABIONS ARE FILLED WITH ROCK, CLOSE THE LIDS AND PERMANENTLY CONNECT THEM TO THE BACK OF THE GABIONS WITH SPIRALS.



COMPLETE THE SOIL BACKFILL AND COMPACTION AS REQUIRED IN THE PROJECT PLANS TO THE TOP OF THE BASKETS

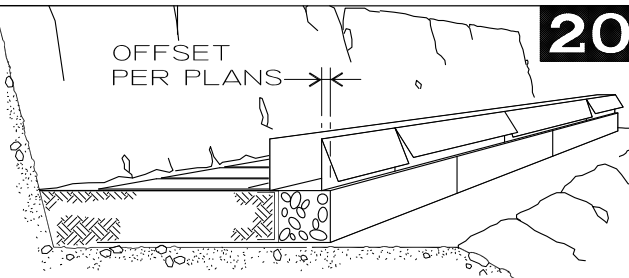
19

PLACE THE SECOND LIFT OF MATS ON THE CLOSED GABIONS AND THE BACKFILL



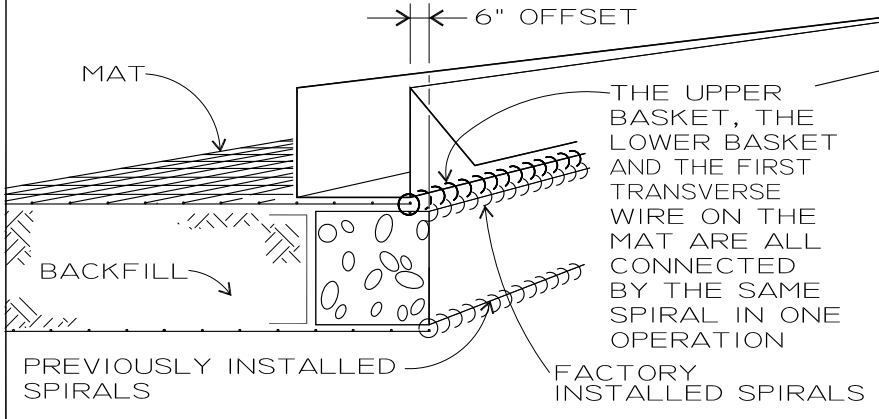
SET THE FIRST TRANSVERSE WIRE ON THE MATS 6" BACK FROM THE FACE OF THE GABIONS. SEE STEP 21.

PLACE THE SECOND ROW OF GABIONS ON THE MATS, WITH THE FRONT FACE OFFSET FROM THE GABIONS BELOW

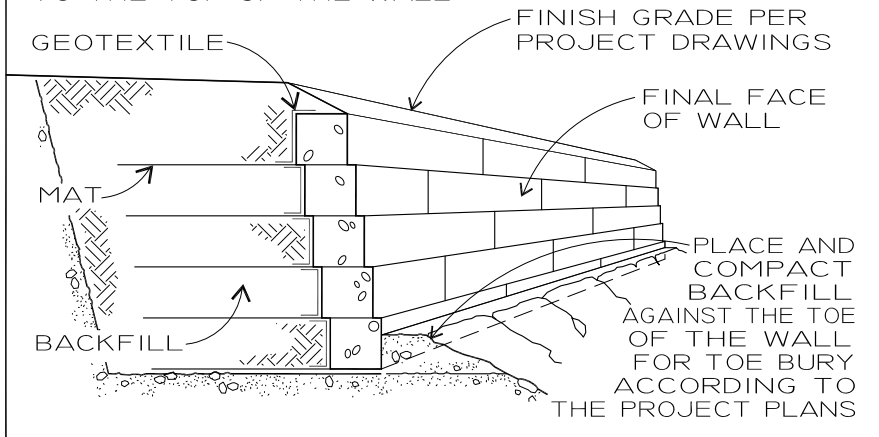
**20**

21

PERMANENTLY CONNECT THE GABIONS AND MATS WITH SPIRALS AS SHOWN.



CONTINUE STEPS 16 THRU 21 TO THE TOP OF THE WALL

22

FORMING ANGLES WITH GABIONS

TO FORM A CONVEX ANGLE (PLAN VIEW LOOKING DOWN ON THE WALL)

TRIM THE BACK OF
THE GABION IF
NECESSARY

SPIRAL
OR TIE
WIRE

BACK OF
GABION
WALL

REMOVE THE
END PANEL ON
THE LEFT GABION
AND SLIDE THE
END OF THE RIGHT
GABION INSIDE. OVERLAP
THE BOTTOM AND LID PANELS

SPIRAL

FACE OF
GABION
WALL

TO FORM A CONCAVE ANGLE (PLAN VIEW LOOKING DOWN ON THE WALL)

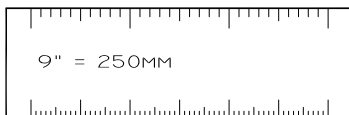
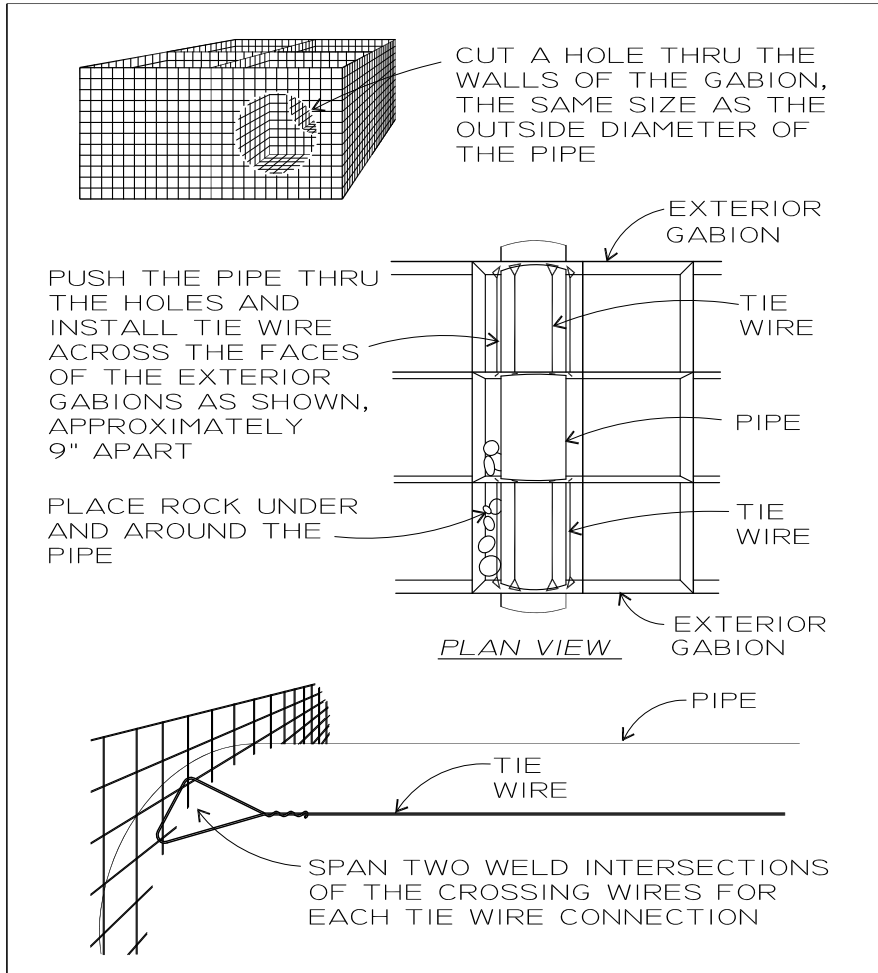
SPREAD THE GABIONS
APART AS NECESSARY

BACK OF
GABION
WALL

SPIRAL

FACE OF
GABION
WALL

PIPE PENETRATION THRU GABION



GABION WIRE SPECIFICATIONS

USA WIRE GAUGE	DIAMETER, INCHES	MINIMUM ALLOWABLE AVERAGE GABION WIRE DIAMETER WITH CLASS 3 ZINC-COATING, INCHES
9	.148	.144
11	.120	.116
13.5	.086	.082 (STANDARD TIE WIRE)

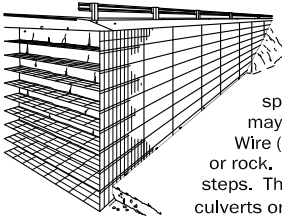
SOIL REINFORCEMENT MAT WIRE SIZE COMPARISON TABLE

"W" SIZE NUMBER	NOMINAL DIAMETER (INCHES)	NOMINAL DIAMETER (MM)
W12.0	.391	9.9
W9.5	.348	8.8
W7.0	.299	7.6
W4.5	.239	6.1
W4.0	.226	5.7
W3.5	.211	5.4

FOR MORE INFORMATION ON WELDED WIRE REINFORCEMENT (WWR)
CHECK THE WEBSITE FOR THE WIRE REINFORCEMENT INSTITUTE.
WWW.WIREREINFORCEMENTINSTITUTE.ORG

HILFIKER MSE WALL SYSTEMS

OTHER HILFIKER PRODUCTS

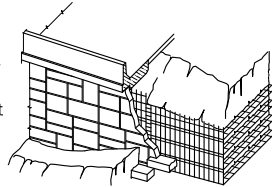


WELDED WIRE WALL

The Hilfiker Welded Wire Retaining Wall is a flexible soil reinforcement system. It is composed of Welded Wire Mesh mats and compacted soil. Mats are supplied in 8' (2.44m) spans, and 24" (610mm) horizontal lifts. The final wall face may be vertical or battered, and may remain exposed Welded Wire (as shown) or may be covered with air-blown mortar, plants or rock. The Welded Wire Wall is adaptable to curves, angles and steps. The mats are easily cut to permit installation of penetrating culverts or pipes, or to fit special site applications.

EUREKA REINFORCED SOIL (E.R.S.)

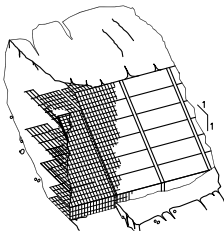
The Hilfiker E.R.S. Retaining Wall begins as a Welded Wire Wall, with the addition of face anchors to tie to a concrete face. After completion and settlement of the Welded Wire Wall, a solid facing is attached. This may be cast-in-place concrete, precast full-height concrete panels, or special rock or gunite as required by the project specifications. The facial treatment of this retaining wall adapts easily to almost any pattern or concept.



HILFIKER STEEPENED SLOPE

The Hilfiker Steepened Slope system is composed of Welded Wire Fabric components. The flat primary soil reinforcement mats are interlocked with bent facing mats, prefabricated to a 1:1 slope. The slope may be flattened, if desired, by stepping back each layer. Behind the facing mats are Welded Wire Fabric backing mats incorporated with erosion mat or sod.

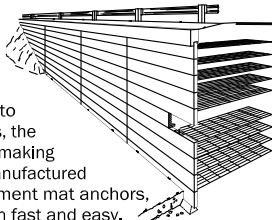
Virtually any type of sod or vegetation that will best suit the environment may be used with this system. Low-growth, maintenance-free vegetation is typically specified.



REINFORCED SOIL EMBANKMENT (SMOOTH FACE)

The R.S.E. Smooth Face Retaining Wall retains most of the advantages of the Hilfiker Welded Wire Wall, while providing the additional durability of precast face panels.

The concrete panels can be cast with a smooth finish, or to match a variety of architectural treatments. In most structures, the simple 12'-6" x 2'-6" (3.81m x 0.76m) standard panel is used, making all the panels interchangeable. Special panel sizes can be manufactured when required. Panels are cast with pre-installed reinforcement mat anchors, and a cantilever footing at the back face, making installation fast and easy.



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HILFIKER RETAINING WALLS

Welded Wire Wall • Eureka Reinforced Soil
Gabion Faced M.S.E. • Reinforced Soil Embankment
ArtWeld Gabions • Spiralnail • Steepened Slope • Trinity Wall

MATERIAL WARRANTY FOR HILFIKER SYSTEMS

Hilfiker Retaining Walls warrants that all retaining wall and gabion materials manufactured by Hilfiker shall be free from defects in design and workmanship and shall conform in all respects to one or more of the following applicable specifications:

ASTM	AASHTO	Standard Specification Description
A1064 *	M 336 **	Steel Wire and Welded Wire, Plain and Deformed
A53		Steel Pipe
A500-03a		Steel Tubing
A36		Carbon Structural Steel
A370	T 244	Test Methods & Definitions for Mechanical Testing of Steel Products
A123	M 111	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products (2 oz. / SF galvanization)
A641		Zinc-Coated (Galvanized) Carbon Steel Wire (class 3 galvanization)
A740 - 98(2014)		Hardware Cloth (Woven or Welded Galvanized Steel Wire Fabric)

*ASTM A82 and A185 were combined in 2010 into A1064

**AASHTO M 32 and M 55 were combined in 2018 into M 336

It is assumed that construction and workmanship meet all material requirements and specifications as provided by Hilfiker. All backfill materials are provided by the Contractor who is solely responsible for the material quality and the installation of the backfill. Not covered by any implied or express warranty would be foundation settlement, settlement of the backfill, erosion of the foundation soils, or corrosion of the reinforcement due to the use of non-conforming backfill, and other external stability matters. Hilfiker Retaining Walls cannot offer a performance warranty because we have no control over the wall materials after delivery to the jobsite.

The design associated with this warranty was based on information provided to Hilfiker and their consulting engineer by the Owner/Contractor. The consulting engineer who prepared the associated design has a valid license and provides professional liability coverage. Their obligation is to live up to the standard of practice (standard of care) for the given geographic location at the time the service is, or was provided. Alterations to their design submittals, without prior approval, will nullify any responsibility on their part.

Hilfiker Retaining Walls requires that the wall components are manufactured to the stipulated ASTM standards as well as internal quality assurance standards for fabrication. However, we do not exercise control over the construction, use, or the service conditions to which the wall is subjected and thus would void our insurance by attempting to extend coverage into areas for which we have no control.

Updated: August 12, 2019

