Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***02820-001.4***
Date:	***9/17/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Fences and Gates		
Reviewed By:	Bruce DiFrancisco		

SUBMITTAL REVIEW		
Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.		
Approved	☐	No Exceptions
	☒	Make Corrections Noted - See Comments
	☐	Make Corrections Noted - Confirm
Not Approved	☐	Correct and Resubmit
	☐	Rejected - See Remarks
Receipt Acknowledged	☐	Filed for Record
	☐	With Comments - Resubmit

Review Comments:

1. **Old Comment:** In the future, attach this form with Contractor Response (see the format template below) typed in to allow for a “response chain” within this document. Applicable to all submittals. For items that remain open, Title of Response will be “Contractor Second Response”.

   Contractor Response: No formal Response Provided

   Engineer Response: Form provided with submittal. Comment Closed.

2. General Comment – on the pipe schedules and fittings cut sheets, mark up the cut sheets to identify what is being provided and/or cross out what is not being provided.

   Contractor Response: No formal response provided.

   Engineer Response: Document marked up to identify what is provided. Comment Closed.

3. Certificate of Compliance sheet says ASTM F1043, Group 1C is provided, but cut sheets provided show Group1A data. If 1C is being provided, please provide 1C data set. If 1A is being provided, correct the Certificate of Compliance.

   Contractor Response: No formal response provided.

   Engineer Response: The certificate of compliance has been removed from the submittal and the Master Halco Framing Pipe has been replaced with Westwood. Please provide an explanation or provide the originally-submitted Master Halco product.

   Second Contractor Response: Wheatland is the domestic pipe spec; MH original specs were for import pipe.

   Engineer Second Response: Wheatland information reviewed and acceptable. Comment Closed.

4. On the Certificate of Compliance, identify that the Permafused product color is Green.

   Contractor Response: No formal response provided.

   Engineer Response: The certificate of compliance has been removed from the submittal, but it is noted that that color has been identified on the Permafused documentation as Green. Comment Closed.

5. On the Certificate of Compliance it is noted that Permafused tensile strength is 75,000 psi. Specification (2.02.A.1.c.2) requires 80,000 psi. Exception for 75,000 psi is allowed.

   Contractor Response: No formal response provided.

   Engineer Response: The certificate of compliance has been removed from the submittal and the Permafused Data does not indicate tensile strength. Confirm that tensile strength is AT LEAST 75,000 psi as noted above.

   Second Contractor Response: Confirmed minimum core wire tensile strength of 75,000 psi.

   Second Engineer Response: Accepted, Comment Closed.

6. Section 2.02.A.3.b.3: Steel bands are specified as 11 gauge, 1-inch wide. What is provided is 14 gauge, ¾" wide. Please upsize to provide what is specified.

   Contractor Response: No formal response provided.

   Engineer Response: 1/8" x 1" provided, which is acceptable. Comment closed.

7. Section 2.02.B.2.a: Provide 1-7/8-inch OD pipe, not 1-5/8-inch.

   Contractor Response: No formal response provided.

   Engineer Response: Comment not addressed in the resubmittal; a 1-7/8-inch OD pipe is specified for the frame and center support. Provide.

   Second Contractor Response: Typical DPW and Parks and Rec standards for State of Hawaii is 1-5/8" OD for 4' wide personnel gate frames.

   Second Engineer Response: DPW specification variance for 1-5/8" OD is accepted, but please note that Parks and Rec Standards are not applicable to this project. Comment Closed.

8. Section 2.02.B.2.b.7: Identify which gate latching hardware you are providing.

   Contractor Response: No formal response provided.

   Engineer Response: Confirm that the "Industrial Latch" is the "Drop Rod" noted in Drawing 2 of 6 or provide information on the drop latch. Other latching hardware identified is acceptable.

   Second Contractor Response: Industrial Latch is the drop rod.

   Accepted. Comment Closed.

9. Section 2.02.B.2.b.8: Rolling gate hardware information is not provided.

   Contractor Response: No formal response provided.

   Engineer Response: Information provided does not meet Section B.2.b.8, which calls for a double wheel rubber tire for ground movement and two rollers on each guide track. Please provide what is specified, as what is submitted is not considered an "equal".

   Second Contractor Response: Revised drawing to rubber wheel carrier. Two rollers per guide track is not industry standard. Standard for slide gate is one wheel per track.

   Second Engineer Response: Correction on rollers per guide track noted. Noted that drawing 4 of 6 indicates 6" double rubber wheel carrier. Comment Closed.

10. Section 2.02.C: The September 3, 2020 letter "RE: Construction Fence Screen" is not acceptable, as it gives no indication that the product is FenceScreen Series 350 or equal. If you are offering an "or equal" product, provide the equivalent data from FenceScreen to confirm that it is an equal product.

    Contractor Response: No formal response provided.

    Engineer Response: Noted that the response is to the letter of the original comment, but intent of original comment was for you to provide information from your alternate manufacturer proving that it is equal to FenceScreen 350, not to provide the FenceScreen info and say your alternate mfr meets it. I apologize for the poorly worded original comment;

please provide information from your proposed alternate manufacturer that confirms it is an "or equal" product.

Second Contractor Response: Alternate Vendor (Rudy Shade) specs attached for their "or equal" product.

Second Engineer Response: (1) Provide PVC Mesh as specified; (2) add the vendor name and contact information to the cut sheet; (3) identify (highlight in the submittal) that grommets are at 24" centers.

11. Section 2.03.A.1. Identify that any products hot-dip galvanized after fabrication meet this section. Product data sheets indicate that some fittings are hot-dip galvanized at 1.2 oz/sf, but requirement is 2 oz/sf per the ASTM references in the spec.

    Contractor Response: No formal response provided.

    Engineer Response: 1.2 oz/sf acceptable; Comment Closed.

12. Drawing 4 of 6:

13. Provide caps on the vertical fence posts.

    Contractor Response: No formal response provided.

    Engineer Response: Provided; Comment Closed

14. Confirm that foundation is 18" diameter minimum.

    Contractor Response: No formal response provided.

    Engineer Response: Provided; Comment Closed.

15. Bollard drawings (5 and 6): Modify the vertical dimensions to conform to details C160 and C161 on Sheet 00-T-01-703. 16" diameter is acceptable.

    Contractor Response: No formal response provided.

    Engineer Response: Bollard Detail Acceptable; Show Removable Bollard with a 4' height plus a ½" rounded cap. Modify both the dimension callout and the cap drawing (show as rounded).

    Second Contractor Response: Revised Drawing.

    Second Engineer Response: Accepted. Comment Closed.

16. **New Comment:** Renumber drawing "4 of 7" to "4 of 6".

    Contractor Response: No formal response provided.

    Engineer Response: Provided; Comment Closed.

Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***02820-001.3***
Date:	***8/22/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Fences and Gates		
Reviewed By:	Bruce DiFrancisco		

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2. General Comment – on the pipe schedules and fittings cut sheets, mark up the cut sheets to identify what is being provided and/or cross out what is not being provided.

   Contractor Response: No formal response provided. X - Closed

   Engineer Response: Document marked up to identify what is provided. Comment Closed.
3. Certificate of Compliance sheet says ASTM F1043, Group 1C is provided, but cut sheets provided show Group1A data. If 1C is being provided, please provide 1C data set. If 1A is being provided, correct the Certificate of Compliance.

   Contractor Response: No formal response provided.

   Engineer Response: The certificate of compliance has been removed from the submittal and the Master Halco Framing Pipe has been replaced with Westwood. Please provide an explanation or provide the originally-submitted Master Halco product. X - Wheatland is the DOMESTIC pipe specs; MH original specs were for Import pipe
4. On the Certificate of Compliance, identify that the Permafused product color is Green.

   Contractor Response: No formal response provided.

Engineer Response: The certificate of compliance has been removed from the submittal, but it is noted that that color has been identified on the Permafused documentation as Green. Comment Closed. X - Closed

5. On the Certificate of Compliance it is noted that Permafused tensile strength is 75,000 psi. Specification (2.02.A.1.c.2) requires 80,000 psi. Exception for 75,000 psi is allowed. X - Confirmed minimum core wire tensile strength of 75,000 psi

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   Engineer Response: The certificate of compliance has been removed from the submittal and the Permafused Data does not indicate tensile strength. Confirm that tensile strength is AT LEAST 75,000 psi as noted above.

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   Contractor Response: No formal response provided.

   Engineer Response: 1/8" x 1" provided, which is acceptable. Comment closed. X - Closed

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11. Section 2.03.A.1. Identify that any products hot-dip galvanized after fabrication meet this section. Product data sheets indicate that some fittings are hot-dip galvanized at 1.2 oz/sf, but requirement is 2 oz/sf per the ASTM references in the spec.

    Contractor Response: No formal response provided.

    Engineer Response: 1.2 oz/sf acceptable; Comment Closed. X - Closed

12. Drawing 4 of 6:

13. Provide caps on the vertical fence posts.

    Contractor Response: No formal response provided.

    Engineer Response: Provided; Comment Closed X - Closed

14. Confirm that foundation is 18" diameter minimum.

    Contractor Response: No formal response provided.

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16. **New Comment:** Renumber drawing "4 of 7" to "4 of 6". X - Revised

☐ High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner: County of Hawaii
Contractor: Nan, Inc.
Project Name: Hilo WWTP Phase 1
Submittal Title: Islandwide Fencing
TO: County
From: Nan Inc.

Project No.: WW-4705R
Submittal Number: 02820-001.4
☐ For Information Only

Specification No. and Subject of Submittal / Equipment Supplier			
Spec: 02820	**Paragraph:**		
Authored By: Islandwide Fencing		**Date Submitted:** 8/27/2025	

Submittal Certification

Check Either (A) or (B):

☑ (A) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with no exceptions.

☐ (B) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings except for the deviations listed.

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

General Contractor's Reviewer's Signature: _____

Printed Name and Title: Mark McCarthy QC

In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.

Firm:	**Signature:**	**Date Returned:**

PM/CM Office Use

Date Received GC to PM/CM:
Date Received PM/CM to Reviewer:
Date Received Reviewer to PM/CM:
Date Sent PM/CM to GC:

Nan, Inc

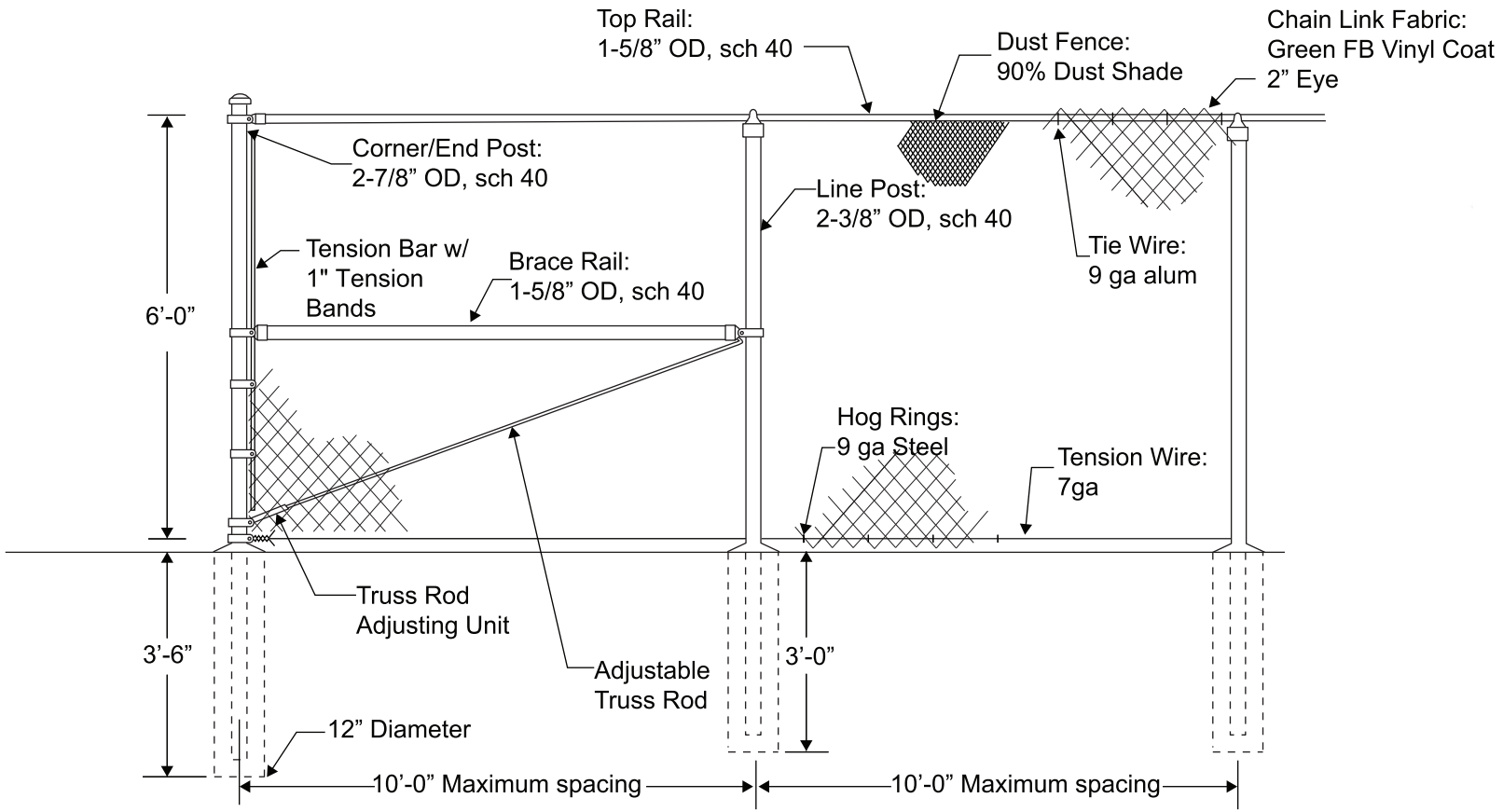
PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

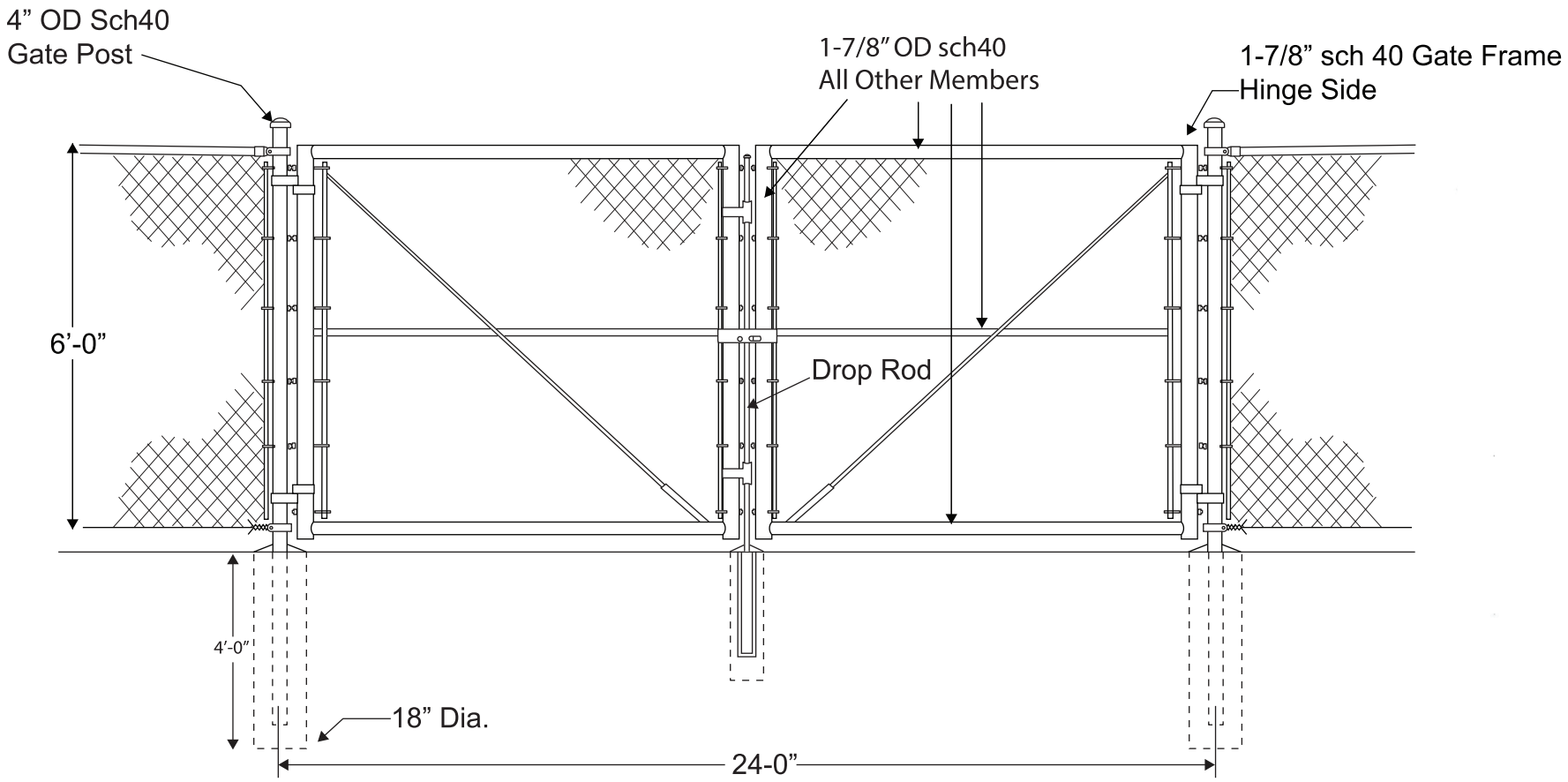
THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED 8/26/2025
SPECIFICATION SECTION # 02820
SPECIFICATION Fences and Gates
PARAGRAPH
DRAWING
SUBCONTRACTOR Islandwide Fencing
SUPPLIER Various
MANUFACTURER Various

CERTIFIED BY CQCM or Designee :____



SUBMITTED BY:	SUBMITTED TO:	Drawing:	DATE
ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	6' high chain link fence	4/23/2025
		JOB/PROJECT Hilo WWTP	SHT 1 OF 6



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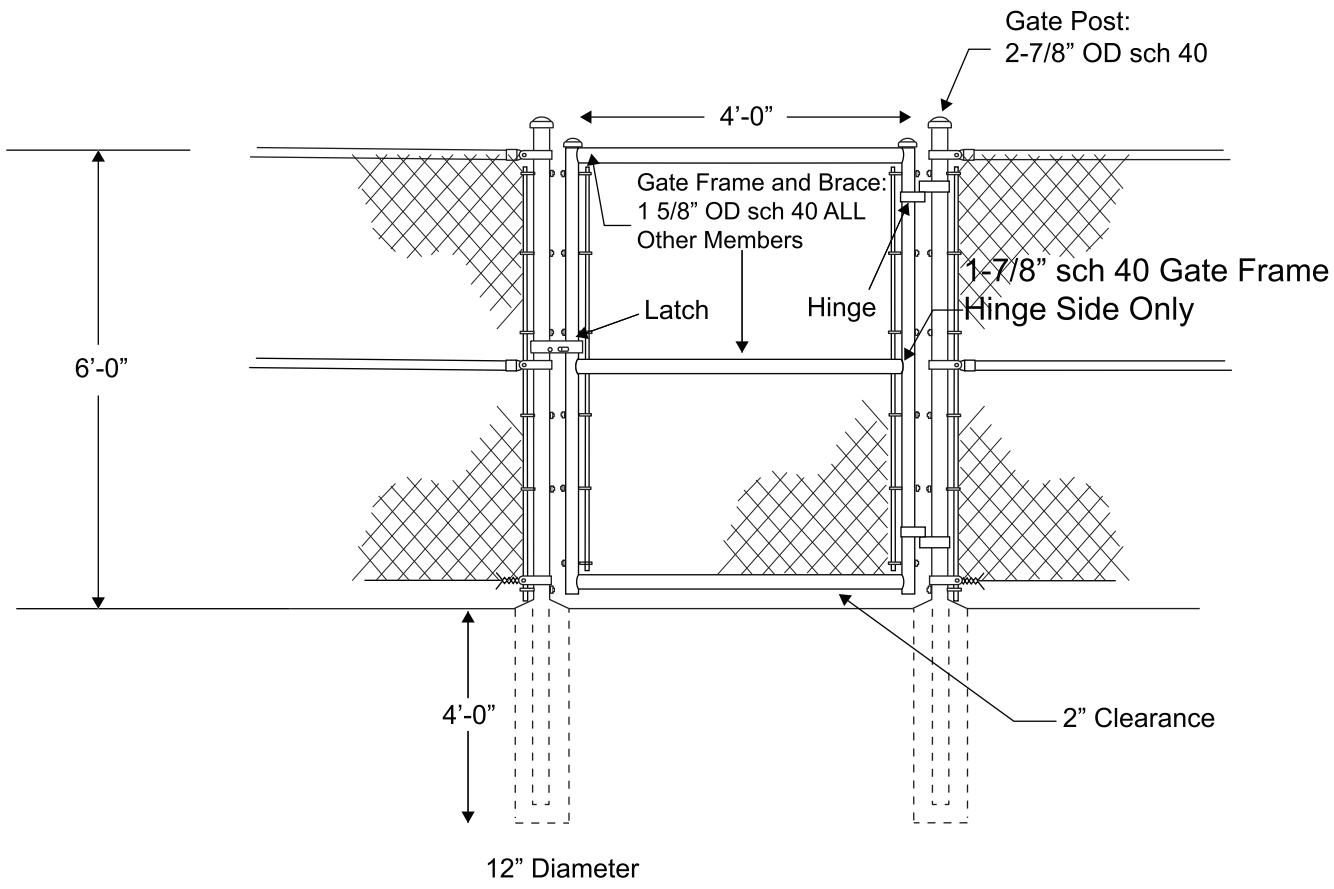
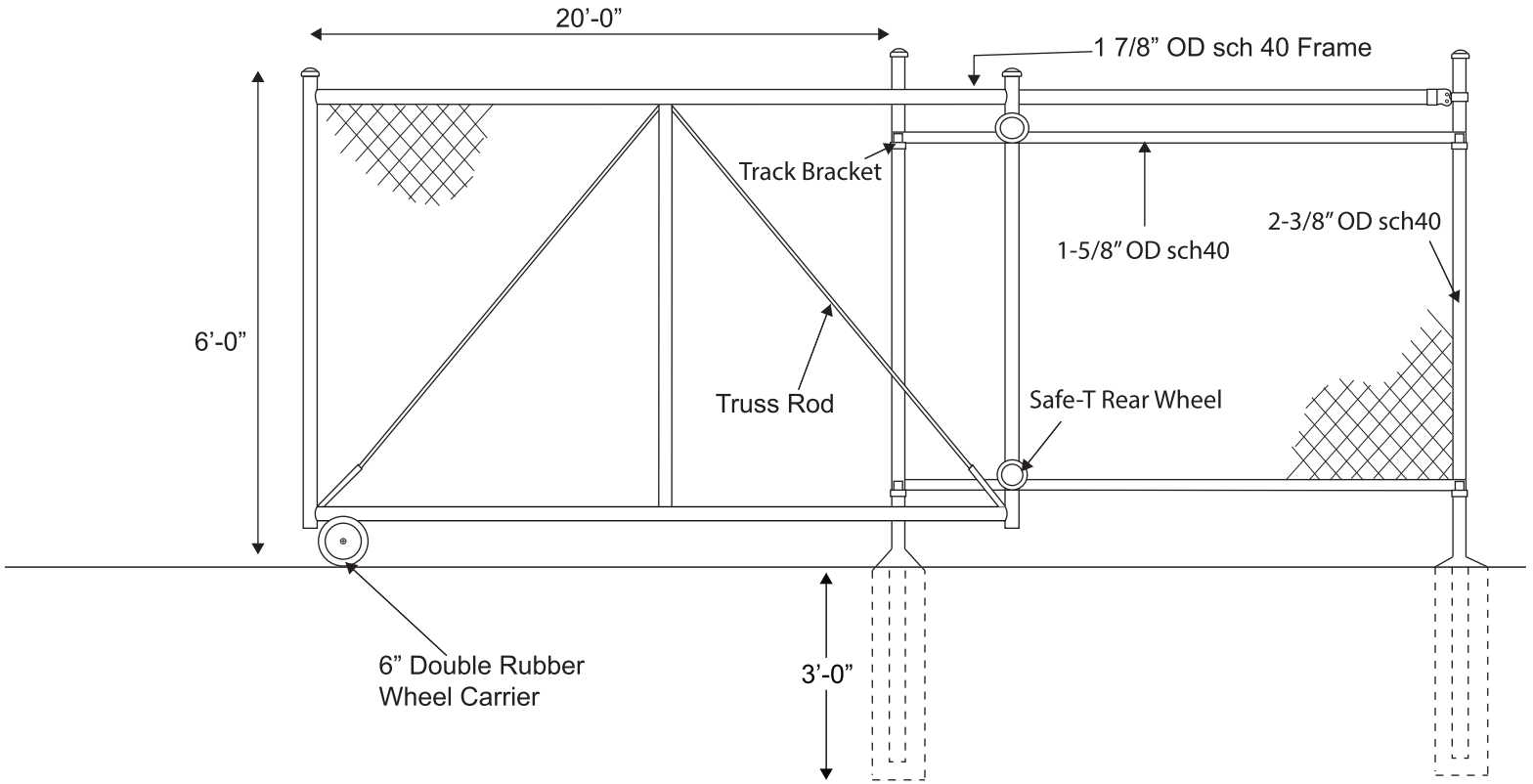
ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	6’ high x 24’ wide chain link double swing gate	6/10/2025
		JOB/PROJECT Hilo WWTP	SHT 2 OF 6



SUBMITTED BY:	SUBMITTED TO:	Drawing:	DATE
ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	6' high x 4' wide chain link pedestrian gate	5/20/2025
		JOB/PROJECT Hilo WWTP	SHT 3 OF 6



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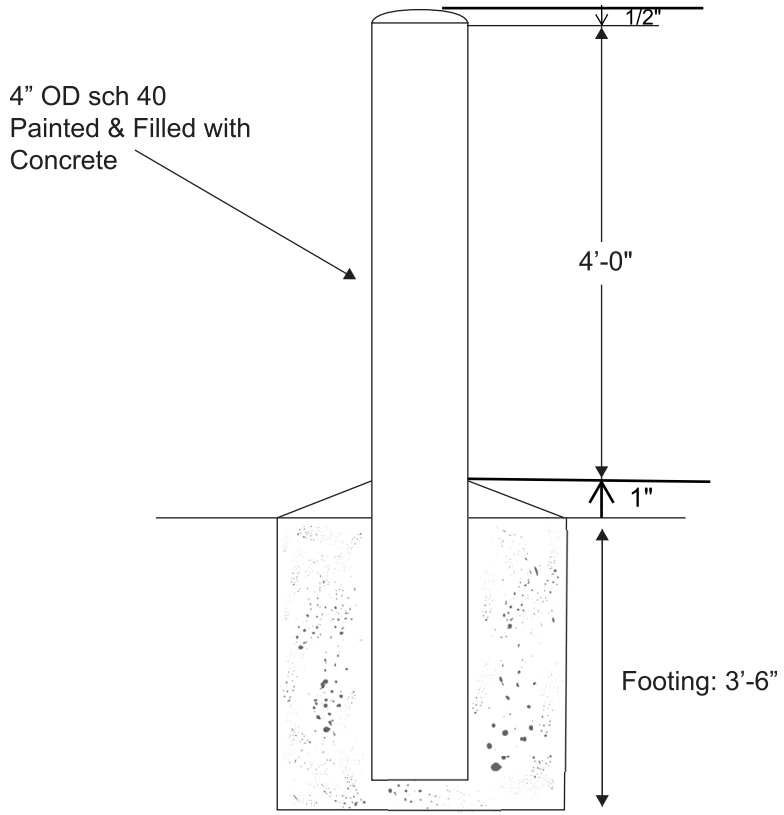
ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	6’ high x 20’ wide chain link slide gate	8/26/2025
		JOB/PROJECT Hilo WWTP	SHT 4 OF 6



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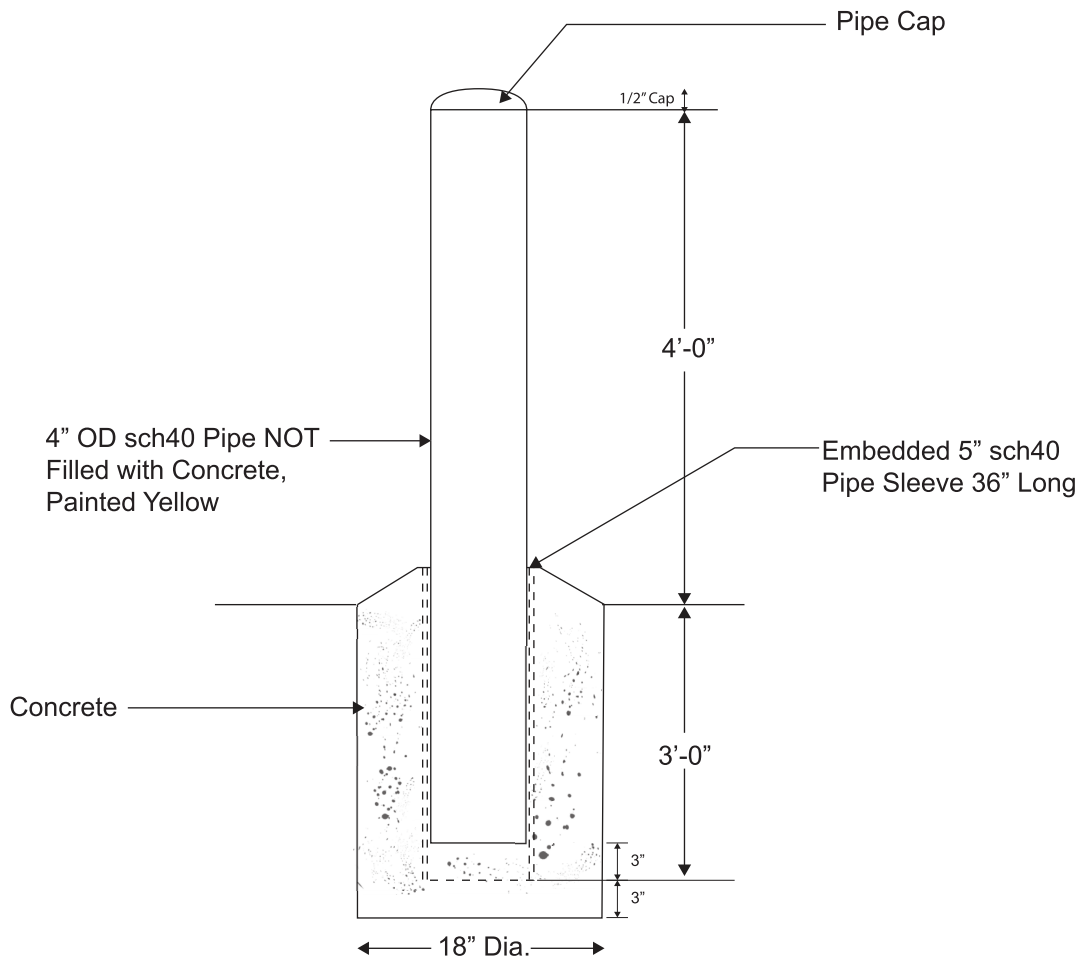
ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	Bollard	6/10/2025
		JOB/PROJECT Hilo WWTP	SHT 5 OF 6



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ISLANDWIDE FENCING, INC. 869 Kanoelehua Avenue Hilo, Hawaii 96720 (808) 935-0800 Ph (808) 935-0845 Fax info@islandwidefencing.com	NAN, INC. 636 LAUMAKA ST. HONOLULU, HI, 96819	Removable Bollard	8/26/2025
		JOB/PROJECT Hilo WWTP	SHT 6 OF 6

6/25/2025

MASTER HALCO™

ISLANDWIDE FENCING INC.
869 Kanoelehua Ave.
Hilo, Hawaii, 96720

RE: Hilo WWTP Rehabilitation and Replacement Project Phase

Fence Fittings 1.2oz:
Master Halco is an approved vendor for the project named above. All fence fittings made from steel or cast iron provided by Master Halco are certified to meet the requirements of ASTM F626-96A and meets AASHTO M -181 and Federal Spec RR-F-191/4. This specification calls for a minimum zinc coating of 1.2 ounces per square foot. Master Halco does not stock 2 ounce fittings, but the 1.2 ounce fittings Master Halco does stock will meet or exceed ASTM F626 requirements.

Albert Gonzales - BR001 Los Angeles, CA
Inside Sales Representative

Master Halco Inc. Product Spec

Fence Fittings

ASTM F 626-08, Federal specification RR-F-191, AASHTO M-181

1. PRODUCT NAME
Fence Fittings, Chain Link

2. MANUFACTURER
Master Halco Inc.
Corporate Headquarters:
3010 Lyndon B Johnson Freeway Ste. 800
Dallas, Tx. 75234
Phone: (800) 883-8384
Master Halco Distribution Centers are located throughout the United States.

3. PRODUCT DESCRIPTION
Basic Use:
Fence fittings include those items that are routinely used in conjunction with metallic coated chain link fabric and framework to complete a chain link fence installation.

Composition and Materials:
Fence fittings for chain link fence may be manufactured from steel or aluminum alloy. Steel items are galvanized after fabrication.

Standards:
ASTM A641/A641M Specification for Zinc–Coated (Galvanized) Carbon Steel Wire
ASTM A809 Specification for Aluminum-Coated (Aluminized) Carbon Steel Wire
ASTM A817 Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire
ASTM B26/B26M Specification for Aluminum-Alloy Sand Castings
ASTM B85 Specification for Aluminum-Alloy Die Castings
ASTM B108 Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B117 Practice for Operating Salt Spray (Fog) Apparatus
ASTM B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B211 Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire
ASTM B211M Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric)
ASTM B221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B429/B429M Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM F552 Terminology Relating to Chain Link Fencing
ASTM F626 Standard Specification for Fence Fittings
ASTM F668 Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric
ASTM A817 Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire
ASTM F934 Specification for Colors for Polymer-Coated Chain Link Fence Materials
Federal specification RR-F-191
American Association of State Highway Transportation Officials M-181 Chain Link Fence

4. TECHNICAL DATA
General:
The manufacturer, if requested, will supply samples and certification that all materials comply with the appropriate specifications.

Post and Line Caps:
Post and line caps are fabricated from pressed steel or cast iron and hot-dip galvanized with a minimum of 1.2oz/ft^2 (366 g/m^2) of zinc coating of surface area, or from aluminum alloy 380.0 conforming to die cast Specification ASTM B85, or sand cast or permanent mold alloy 356.0 or 713.0 conforming to Specification ASTM B26/B26M or ASTM B108.

Rail and Brace Ends:
Rail and brace ends are fabricated from pressed steel or cast iron and galvanized with a minimum of 1.2 oz/ft^2 (366 g/m^2) of zinc, or aluminum alloy 6063-T6 (ASTM B221 or B429). The thickness is 0.051 in. (1.3 mm) of steel or 0.062 in. (1.8 mm), of aluminum alloy, minimum length is 6 in. (152 mm).

Top Rail Sleeves:
Top rail sleeves shall be fabricated from pressed steel or round steel tubing and hot-dip galvanized with a minimum of 1.2oz /ft^2 (366 g/m^2) of zinc coating surface area, or from aluminum alloy 6063-T6 (see Specification B221, B221m or Specification B429/B429M). Rail sleeve material shall be a minimum of 0.051 in. (1.3 mm) in thickness if steel, or a minimum of 0.062 in. (1.8mm) in thickness if aluminum alloy, and a minimum of 6 in. (152.4 mm) in length.

Tie Wires and Hog Rings:
Tie Wire used to tie fabric to frame work and Hog rings for attaching fabric to tension. Fabricated from steel wire galvanized minimum zinc coating 1.2oz/ft^2 (366 g/m^2) 9 gauge (0.148) (3.76 mm) steel wire - lighter gauge steel wire may be used on lighter gauge mesh, see ASTM F626.

Tension and Brace Bands:
Tension and brace bands are fabricated from pressed steel or cast iron and galvanized with a minimum of 1.2 oz/ft^2 (366 g/m^2) of zinc, or aluminum alloy 6063-T5, 6063-T6, or 8176-H19 (ASTM B211 or B221). Tension bands have a minimum material thickness of 14 ga. (0.074 in. (1.88 mm) and a minimum width of ¾ in. (19 mm). Brace bands have a minimum material thickness of 12 ga. (0.105 in. 2.66 mm) and a minimum width of ¾ in. (19 mm).

Tension bars:
Steel tension bars are fabricated from merchant quality steel and galvanized, minimum zinc coating weight 1.2oz/ft^2 (366 g/m^2). Steel tension bars used to connect 1-3/4 in. (44 mm) and 2 in. (50 mm) mesh fabric to end, gate and corner posts are a minimum 3/16 in. (4.8 mm) by 5/8 in. (16 mm) for fabric heights to 5 ft. (1,520 mm) and 3/16 in. (16 mm) by 3/4 in. (19 mm) for fabric heights over 5 ft. (1,520 mm). Tension bars used to connect 1 in. mesh fabric to end; gate and corner posts are a minimum 1/4 in. (6 mm) by 3/8 in. (10 mm). The minimum length of a tension bar is 2 in. (50 mm) less than the full height of the chain link fabric.

Truss Rod and Tightener:
Steel truss rods shall be fabricated from 3/8 in. (9.5mm) merchant quality rod and it and all related devices shall be hot-dip galvanized after threading with a minimum of 1.2oz/ft^2 (366 g/m^2) of zinc coating and shall withstand 2000lb (900 kg) of tension.

Barbed Wire Arms:
Barbed wire arms shall be fabricated from pressed steel or cast iron, and hot-dip galvanized with a minimum 1.2 oz/ft^2 (366 g/m^2) of zinc coating. Barbed wire arms are available as various types.

Tension Wire:
Tension wire per ASTM A817 Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric and Marcelled Tension Wire, shall be 7 gauge (0.177 + 0.005 in. (4.50 + 0.13 mm) is either zinc or aluminum coated:

Type I - Aluminum-coated (aluminized), minimum average coating weight 0.40oz/ft^2 (122 g/m^2).

Type II - Zinc-coated (galvanized), Class 4, minimum average coating weight 1.2oz/ft^2 (366 g/m^2).

Minimum breaking strength is 1,950 lbf [8,670 N].

MASTER HALCO®
A Tradition of Fencing Solutions

Revised: March 2017

Master Halco Inc. Product Spec

Fence Fittings

ASTM F 626, Federal specification RR-F-191, AASHTO M-181

COLOR COATING OF FITTINGS:

Fittings may be color coated with a polymer to match the fabric, when so specified. Standard colors are as contained in ASTM F934. Painted fittings are not acceptable. The exterior surface of the fittings shall be polymer coated with a minimum 0.006-in (0.152-mm), maximum 0.015-in (0.381-mm) thickness when so specified. Ferrous fittings shall be hot-dip galvanized prior to application of color coating

5. AVAILABILITY AND COST

Availability:

Chain link fittings are available for shipment throughout the United States and worldwide.

Cost:

Costs may vary with specific project requirements. Costs may be obtained through all Master Halco Distribution Centers.

6. MAINTENANCE

Periodic inspection is recommended but no routine maintenance is required.

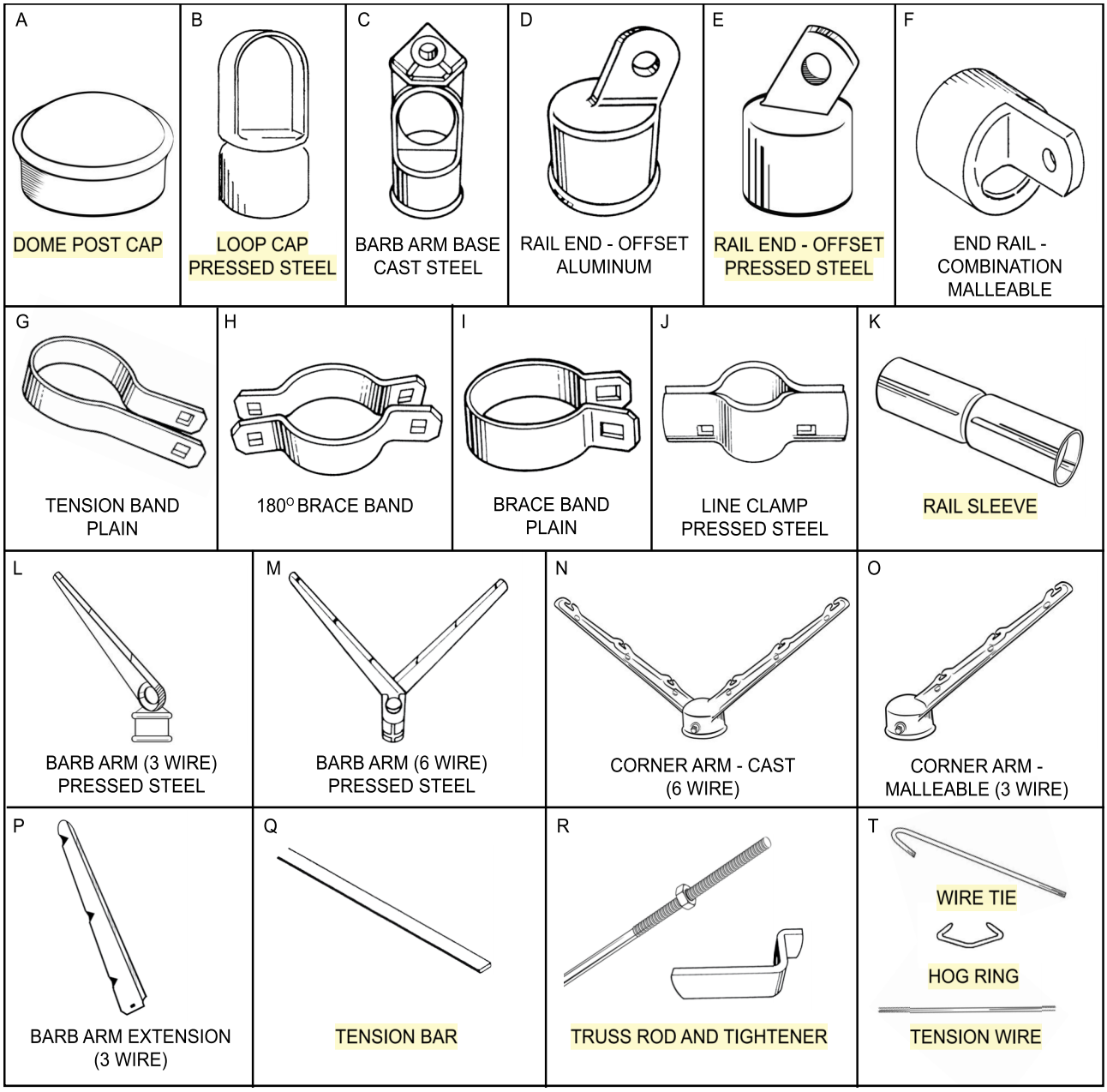
7. TECHNICAL SERVICES

Specifications, drawings, and other technical services are available through the Master Halco Customer Service Center or your local Distribution Center.

Technical Services:
Phone: (800) 883-8384 (toll free)

E-Mail: customer service@masterhalco.com
Website: www.masterhalco.com

Representative Illustrations of Common Chain Link Fence Fittings (not to scale)



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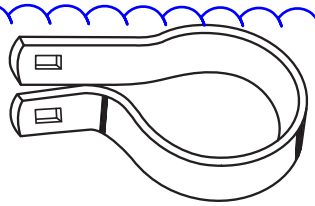
MASTER HALCO®
A Tradition of Fencing Solutions

Revised: March 2017

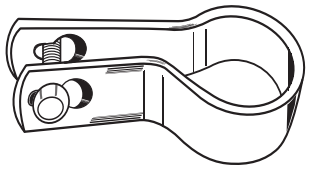
Heavy Tension Bands / 1/8" x 1" Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-3/8"	010201	250	.26	
1-5/8"	010202	250	.30	
1-7/8"	010203	100	.33	
2-3/8"	010204	100	.39	
2-7/8"	010205	100	.42	
3-1/2"	010207	100	.50	
4"	010208	50	.59	
4-1/2"	010209	50	.66	
6-5/8"	010210	50	.85	
8-5/8"	010211	50	1.10	

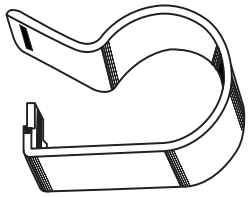
Use 3/8" x 1-1/2" Carriage Bolt – Pt. #010704

Snappy Tension Band / Pressed Steel – Galvanized with Aluminum Fastener



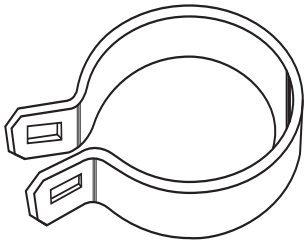
DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-3/8"	010121	100	.10	

Boltless Tension Band / Aluminum



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
2-3/8"	010164	250	.06	

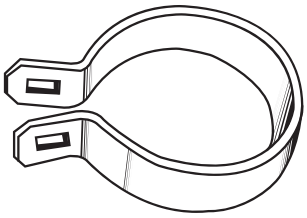
Regular Brace Bands / 12 ga. x 3/4" Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-3/8"	010301	250	.13	
1-5/8"	010302	250	.15	
1-7/8"	010303	250	.18	
2-3/8"	010304	250	.21	
2-7/8"	010305	100	.24	
3" Full	010306	100	.25	
3-1/2"	010307	100	.30	
4"	010308	100	.34	
4-1/2"	010309	100	.36	

Use 5/16" x 1-1/4" Carriage Bolt – Pt. #010701

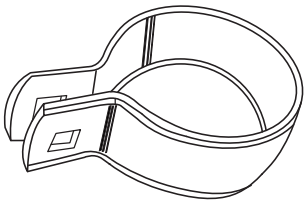
Medium Brace Bands / 12 ga. x 7/8" Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-3/8"	010651	250	.17	
1-5/8"	010652	250	.19	
1-7/8"	010653	250	.21	
2-3/8"	010654	250	.24	
2-7/8"	010655	100	.29	
3-1/2"	010657	100	.33	
4"	010658	100	.38	
4-1/2"	010659	100	.45	
6-5/8"	010660	50	.65	

Use 5/16" x 1-1/4" Carriage Bolt – Pt. #010701

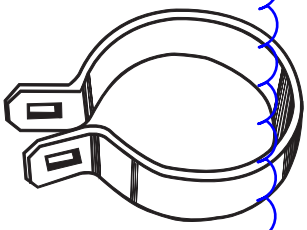
Beveled Brace Bands / 12 ga. x 7/8" Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-5/8"	010453	300	.20	
1-7/8"	010453	250	.22	
2-3/8"	010454	250	.25	
2-7/8"	010455	100	.33	
4"	010458	100	.41	
6-5/8"	010460	50	.76	
8-5/8"	010461	50	.80	

Use 5/16" x 1-1/4" Carriage Bolt – Pt. #010701

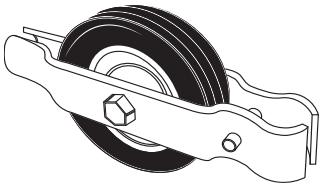
Heavy Brace Bands / 1/8" x 1" Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-3/8"	010401	250	.20	
1-5/8"	010402	250	.25	
1-7/8"	010403	100	.26	
2-3/8"	010404	100	.32	
2-7/8"	010405	100	.36	
3-1/2"	010407	100	.44	
4"	010408	50	.49	
4-1/2"	010409	50	.55	
6-5/8"	010410	50	.77	
8-5/8"	010411	50	1.02	
Sr. H	010413	100	.35	

Use 3/8" x 1-1/2" Carriage Bolt – Pt. #010704

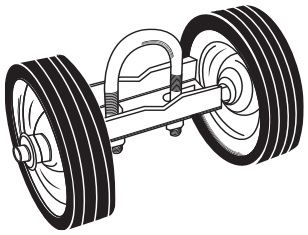
Single-Wheel Carriers / Pressed Steel – Galvanized • Includes bolts



Weld-on Type, 5/8" Axle.

DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-5/8" Frame, 6" Wheel	018201	4	4.80	
1-5/8" Frame, 8" Wheel	018202	4	7.21	
1-7/8" Frame, 6" Wheel	018203	4	4.82	
1-7/8" Frame, 8" Wheel	018204	4	7.23	

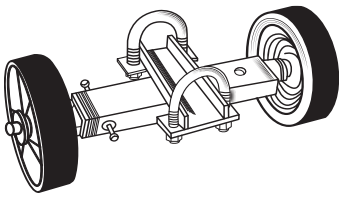
Residential Double-Wheel Carriers / Pressed Steel – Galvanized Includes bolts



Clamp-on Type 5/8" Axle, 7" Wheel Base. For 1-5/8" or 1-7/8" Frame.

DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
6" Wheel	018331	4	6.25	
8" Wheel	018332	4	9.25	

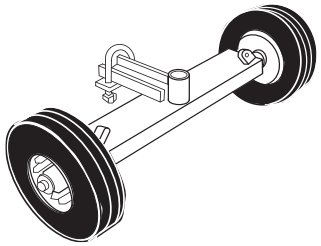
Industrial Double-Wheel Carriers / Pressed Steel – Galvanized • Includes bolts



Clamp-on Type 5/8" Axle, 12" Wheel Base. For 1-5/8" or 1-7/8" Frame.

DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
6" Steel Hub Wheels	018301	4	8.50	
8" Steel Hub Wheels	018302	4	12.38	
8" Aluminum Hub Wheels with Grease Fitting	018304	4	10.80	
Carrier Only Without 6" Wheels	018306	4	5.34	
Carrier Only Without 8" Wheels	018307	4	5.66	

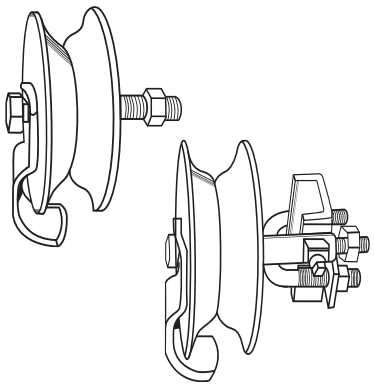
Heavy Duty Ground Carrier / Pressed Steel – Galvanized • Includes bolts



Clamp-on Type, Outrigger Fittings, 3/4" Axle, 21" Wheel Base. For 1-5/8" or 1-7/8" Frame.

DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
8" Heavy Duty Steel Hub Wheels with Grease Fittings	018341	1	28.00.	

Safe-T Rear Wheel For 1-5/8" Pipe Track / Pressed Steel – Galvanized
Includes bolts

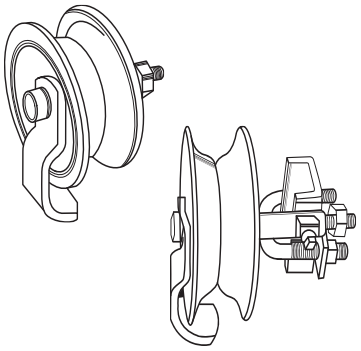


DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
5" Wheel	018421	10	2.90	
5" Wheel w/Bracket Assembly*	018422	4	4.55	
5" Wheel w/Bracket Assembly**	856V00	10	5.52	
7" Wheel	018418	10	2.90	
7" Wheel w/Bracket Assembly*	018419	4	4.55	

*Universal Holding Bracket Assembly for 1-5/8" or 1-7/8" Frame
**Dual Bolt Bracket Assembly

Universal Holding Bracket Only (With 6" Bolt)	018413	25	1.85	

Safe-T Rear Wheel For 1-5/8" Pipe Track / Heavy Duty – Malleable
Includes bolts with Grease Fitting

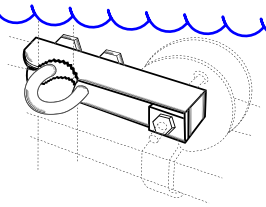


DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
5" Wheel	018441	10	5.75	
5" Wheel w/Bracket Assembly*	018442	4	7.92	

*Universal Holding Bracket Assembly for 1-5/8" or 1-7/8" Frame

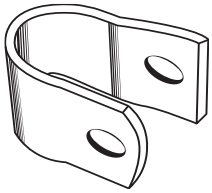
Universal Holding Bracket Only (With 6" Bolt)	018413	25	1.85	

Clamp-On Roller Bracket / Heavy Duty • Pressed Steel – Galvanized
Includes U-Bolt



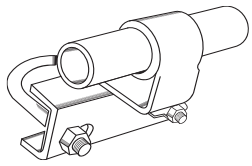
DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-5/8" or 1-7/8" Frame	018412	25	1.85	

Brackets For Rear Wheel / Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
1-5/8" Gate Frame	018410	25	0.66	
1-7/8" Gate Frame	018411	25	0.68	

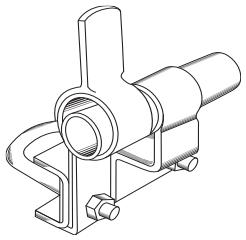
Safe-T Line Track Brackets 1-5/8" Pipe Track / Heavy Duty
Pressed Steel – Galvanized • Includes bolts



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
For 1-5/8" or 1-7/8" Post	018561	20	2.55	
For 2-3/8" or 2-7/8" Post	018562	20	2.65	
For 4" Post	018631	20	2.92	

NOTE: Pat. No. 3,215,702

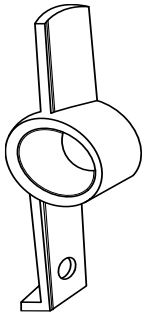
Safe-T End Track Brackets for 1-5/8" Pipe Track / Heavy Duty
Pressed Steel – Galvanized • Includes bolts



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
For 1-5/8" or 1-7/8" Post	018565	20	3.16	
For 2-3/8" or 2-7/8" Post	018566	20	3.29	

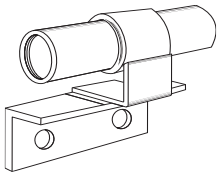
NOTE: Pat. No. 3,215,702

Safe-T Gate Stop for 1-5/8" Pipe Track / Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
Heavy Duty	018569	20	0.71	

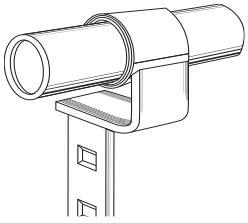
Flat-Back Line Track Bracket for 1-5/8" Pipe Track /Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
Flat Back	018534	20	1.93	

NOTE: For Flat Surface-Block Walls.

Band-Type Line Track Bracket for 1-5/8" Pipe Track /
Pressed Steel – Galvanized



DESCRIPTION	PART NO.	PER SACK	WEIGHT EA.	NOTES
Universal	018538	20	1.38	

Use with two 1/8" x 1" Brace Bands (sold separately).

Master Halco Inc. Product Spec

Gate Fittings

ASTM F 626-08, Federal specification RR-F-191, AASHTO M-181

1. PRODUCT NAME
Gate Fittings, Chain Link

2. MANUFACTURER
Master Halco Inc.
Corporate Headquarters:
3010 Lyndon B Johnson Freeway Ste. 800
Dallas, Tx. 75234
Phone: (800) 883-8384
Master Halco Distribution Centers are located throughout the United States.

3. PRODUCT DESCRIPTION
Basic Use:
Gate fittings include those items that are routinely used in conjunction with metallic coated chain link; walk and drive gates to complete a chain link fence installation.

Composition and Materials:
Gate fittings for chain link fence may be manufactured from steel or aluminum alloy. Steel items are galvanized after fabrication.

Standards:
ASTM A641/A641M Specification for Zinc–Coated (Galvanized) Carbon Steel Wire
ASTM A809 Specification for Aluminum-Coated (Aluminized) Carbon Steel Wire
ASTM A817 Specification for Metallic-Coated Wire for Chain-Link Fence fAbric and Marcelled Tension Wire.
ASTM B26/B26M Specificatio for Aluminum-Alloy Sand Castings
ASTM B85 Specification for Aluminum-Alloy Die Castings ASTM B108 Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B117 Practice for Operating Salt Spray (Fog) Apparatus
ASTM B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B211 Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire
ASTM B221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes ASTM B221M Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B429/B429M Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM F552 Terminology Relating to Chain Link Fencing
ASTM F626 Standard Specification for Fence Fittings
ASTM F 654 Standard Specification for Residential Chain Link Fence Gates
ASTM F668 Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric
ASTM F900 Standard Specification for Industrial and Commercial Swing Gates
ASTM F1184 Standard Specification for Industrial and Commercial Horizontal Slide gate
ASTM F2200 Standard Specification for Automated Vehicular Gate Construction
ASTM F934 Specification for Colors for Polymer-Coated Chain Link Fence Materials
Federal specification RR-F-191 American Association of State Highway Transportation Officials M-181 Chain Link Fence

4. TECHNICAL DATA
General:
The manufacturer, if requested, will supply samples and certification that all materials comply with the appropriate specifications.

Gate and Frame Hinges:
Hinges are fabricated from pressed steel or cast iron and hot-dip galvanized with a minimum of 1.2oz/ft² (366 g/m²) of zinc coating of surface area, or from aluminum alloy 380.0 conforming to die cast Specification ASTM B85, or sand cast or permanent mold alloy 356.0 or 713.0 conforming to Specification ASTM B26/B26M or ASTM B108.

Industrial Hinges:
Industrial Hinges are fabricated from pressed steel or cast iron and galvanized with a minimum of 1.2 oz/ft² (366 g/m²) of zinc, or aluminum alloy 6063-T6 (ASTM B221 or B429).

Fork Latch:
Top rail sleeves shall be fabricated from pressed steel or round steel tubing and hot-dip galvanized with a minimum of 1.2oz /ft² (366 g/m²) of zinc coating surface area, or from aluminum alloy 6063-T6 (see Specification B221, B221m or Specification B429/B429M). Rail sleeve material shall be a minimum of 0.051 in. (1.3 mm) in thickness if steel, or a minimum of 0.062 in. (1.8mm) in thickness if aluminum alloy, and a minimum of 6 in. (152.4 mm) in length.

Tie Wires and Hog Rings:
Tie Wire used to tie fabric to frame work and Hog rings for attaching fabric to tension. Fabricated from steel wire galvanized minimum zinc coating 1.2oz/ft² (366 g/m²) 9 gauge (0.148) (3.76 mm) steel wire - lighter gauge steel wire may be used on lighter gauge mesh, see ASTM F626.

Strong Arm Latch:
Strong Arm Latch's are fabricated from pressed steel or cast iron and galvanized with a minimum of 1.2 oz/ft² (366 g/m²) of zinc, or aluminum alloy 6063-T5, 6063-T6, or 8176-H19 (ASTM B211 or B221).

Tension bars:
Steel tension bars are fabricated from merchant quality steel and galvanized, minimum zinc coating weight 1.2oz/ft² (366 g/m²). Steel tension bars used to connect 1-3/4 in. (44 mm) and 2 in. (50 mm) mesh fabric to end, gate and corner posts are a minimum 3/16 in. (4.8 mm) by 5/8 in. (16 mm) for fabric heights to 5 ft. (1,520 mm) and 3/16 in. (16 mm) by 3/4 in. (19 mm) for fabric heights over 5 ft. (1,520 mm). Tension bars used to connect 1 in. mesh fabric to gate frames are a minimum 1/4 in. (6 mm) by 3/8 in. (10 mm). The minimum length of a tension bar is 2 in. (50 mm) less than the full height of the chain link fabric.

Truss Rod and Tightener:
Steel truss rods shall be fabricated from 3/8 in. (9.5mm) merchant quality rod and it and all related devices shall be hot-dip galvanized after threading with a minimum of 1.2oz/ft² (366 g/m²) of zinc coating and shall withstand 2000lb (900 kg) of tension.

Barbed Wire Arms:
Barbed wire arms shall be fabricated from pressed steel or cast iron, and hot-dip galvanized with a minimum 1.2 oz/ft² (366 g/m²) of zinc coating. Barbed wire arms are available as various types.

Tension Wire:
Tension wire per ASTM A817 Specification for Metallic-Coated Steel Wire for Chain-Link Gates:

Type I - Aluminum-coated (aluminized), minimum average coating weight 0.40oz/ft² (122 g/m²).

Type II - Zinc-coated (galvanized), Class 4, minimum average coating weight 1.2oz/ft² (366 g/m²).

Minimum breaking strength is 1,950 lbf [8,670 N].

MASTER HALCO®
Quality Products, Exceptional Service, Outstanding People

Revised: August 2018

Master Halco Inc. Product Spec

Gate Fittings

ASTM F 626, Federal specification RR-F-191, AASHTO M-181

COLOR COATING OF FITTINGS:

Fittings may be color coated with a polymer to match the fabric, when so specified. Standard colors are as contained in ASTM F934. Painted fittings are not acceptable. The exterior surface of the fittings shall be polymer coated with a minimum 0.006-in (0.152-mm), maximum 0.015-in (0.381-mm) thickness when so specified. Ferrous fittings shall be hot-dip galvanized prior to application of color coating

5. AVAILABILITY AND COST

Availability:

Chain link Gate fittings are available for shipment throughout the United States and worldwide.

Cost:

Costs may vary with specific project requirements. Costs may be obtained through all Master Halco Distribution Centers.

Website: www.masterhalco.com

6. MAINTENANCE

Periodic inspection is recommended but no routine maintenance is required.

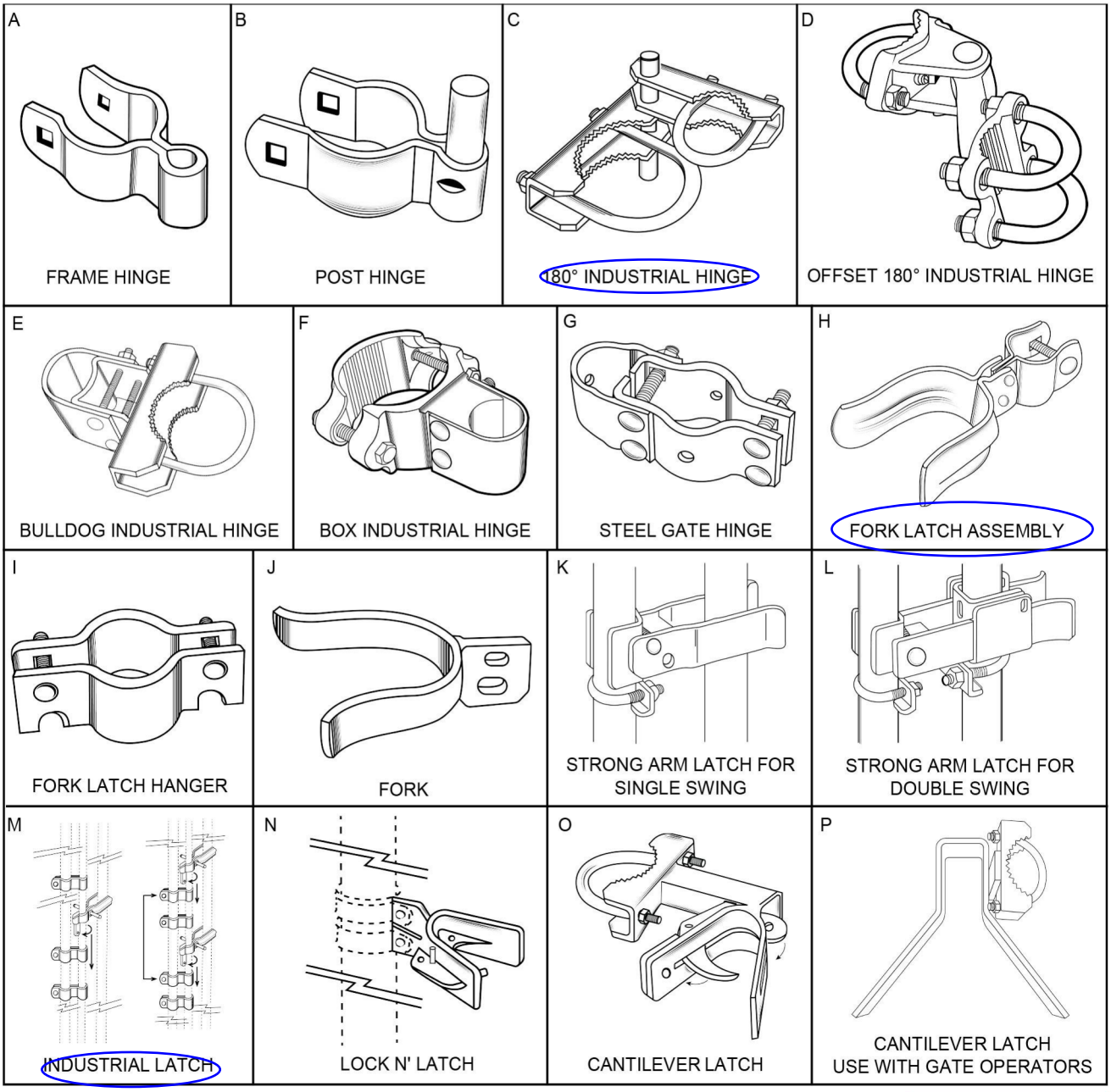
7. TECHNICAL SERVICES

Specifications,drawings,and other technical services are available through the Master Halco Customer Service Center or your local Distribution Center.

Technical Services:
Phone: (800) 883-8384 (toll free)

E-Mail: customer service@masterhalco.com

Representative Illustrations of Common Chain Link Gate Fittings (not to scale)



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Website: www.masterhalco.com

MASTER HALCO®
Quality Products, Exceptional Service, Outstanding People

Revised: August 2018

Permafused® II Commercial
Color Chain-Link Fence System

Permafused II, the new generation in color chain-link fence systems, offers unparalleled performance over ordinary systems, featuring a polyolefin coating.

Revolutionary Coating Excellent long-term adhesion between the galvanized steel substrate and the exterior coating without the need of a solvent based primer makes Permafused II environmentally friendly.

Durable Superior performance in highly corrosive environments provides years of protection and security.

UV Resistant Outstanding resistance to ultra violet light prevents premature fading and decay.

Maintenance-Free Extreme flexibility reduces susceptibility to cracking and chipping, even in changing weather conditions and it's high impact resistance reduces the chance of damage during product handling and installation.

Confidence 15-year limited warranty provides confidence and assurance that you've selected one of the best color chain-link fence systems available.

Meets ASTM F 668 Class 2b specification

MASTER HALCO®

Color Systems

Master Halco's Permafused II is the perfect choice for commercial property owners who need the strength and protection of a chain-link fence system plus an appearance that blends in beautifully with the environment. Permafused II is the perfect choice for applications where security, protection from corrosion, and the durability that you would expect from a quality chain-link color system are important. For privacy, choose from different types of decorative polyethylene slats tinted to match the shades of Permafused II color chain-link systems.

Note: Due to manufacturing variances and limitations in the production process, colors may vary from this brochure. Contact Master Halco for actual color samples.

Material Specifications

Chain-Link Fabric

Type	Permafused II polyolefin fused and adhered to zinc-coated steel wire per ASTM F 668 Class 2b
Gauge	6, 9, 11 and 14 gauge galvanized core wire
Mesh*	3/8", ½", 5/8", 1", 1-1/4", 1-3/4" and 2"
Heights*	3',42",4',5',6' 7', 8', 10', 12', 16' and 20'
Selvage	Knuckled top and bottom up to 5' high, twisted and knuckled 6' to 20' high, except 1-1/4" mesh and smaller knuckled top and bottom

*Some mesh sizes and heights are special order and may require longer lead times.

Fittings

Tension and Brace Bands	Permafused II coating, 6 mils minimum, over hot-dipped galvanized pressed steel
Caps, Eye Tops, Rail Ends	Permafused II coating, 6 mils minimum, over hot-dipped galvanized pressed steel
Sleeves	Permafused II coating, 6 mils minimum, over hot-dipped galvanized steel
Tie Wires	Permafused II coating, 6 mils minimum, over zinc-coated steel wire

Swing Gates

Fabric	Same mesh and gauge as chain-link selected
Framework	1-5/8" O.D. for gates up to 6' high or less 1-7/8" O.D. for gates over 6' high
or	2" Sq. steel tubular (2.60 lb./ft.) or 2" Sq. aluminum tubular (0.94 lb./ft.)

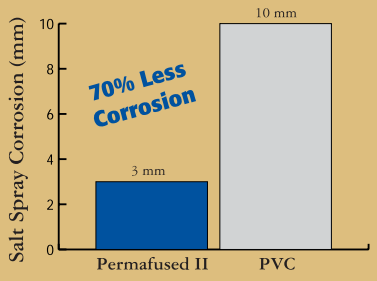
Framework

Type 1	Permafused II polyolefin, 10 mils minimum, over galvanized steel ASTM F 1043, Group 1A, standard weight pipe, schedule 40. Hot-dipped galvanized with a minimum average 1.8 ounces per square foot of zinc-coated surface area
Type 2	Permafused II polyolefin, 10 mils minimum, over galvanized steel ASTM F 1043, Group 1C, with minimum yield strength of 50,000 PSI. Protective coating per ASTM F 1043, external coating Type B, zinc with organic overcoat, 0.9 ounces per square foot minimum zinc coating with chromate conversion coating and verifiable polymer film.
Top Rail	Type 1: 1-5/8" O.D. Permafused II standard weight pipe (0.140" wall thickness, 2.27 lb./ft.) Type 2: 1-5/8" O.D. Permafused II DQ 40 pipe (0.111" wall thickness, 1.83 lb./ft.)
Line Posts	Type 1: 2-3/8" O.D. Permafused II standard weight pipe (0.154" wall thickness, 3.65 lb./ft.) Type 2: 2-3/8" O.D. Permafused II DQ 40 pipe (0.130" wall thickness, 3.12 lb./ft.)
Terminal Posts	Type 1: 2-7/8" O.D. Permafused II standard weight pipe (0.203" wall thickness, 5.79 lb./ft.) Type 2: 2-7/8" O.D. Permafused II DQ 40 pipe (0.160" wall thickness, 4.64 lb./ft.)

MASTER HALCO®

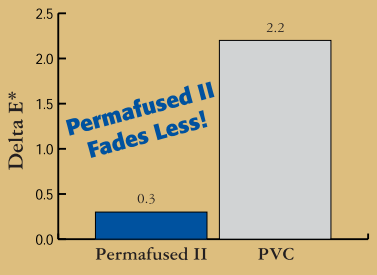
4000 W. Metropolitan Dr., Suite 400
Orange, CA 92868
1.888.MH.FENCE (toll-free)
e-mail: info@FenceOnline.com
www.FenceOnline.com

Salt Spray Resistance



Level of corrosion under color coating after 1,000 hours of exposure to salt spray of scribed sample. Test conducted in compliance with ASTM B 117.

Fade Resistance



Based on 268 days of testing of black color samples in the Arizona sun.

*Delta E is a mathematical calculation that measures change in color based upon electronic readings of the LAB scale before and after submission to ultraviolet radiant exposure of 891,000 langleys.

Sports Complex
Color Chain-Link Fence System

Master Halco, the nation's largest manufacturer and distributor of fence solutions, is proud to offer the latest generation of color chain-link systems designed specifically for sports complex applications. Our unique color-coated systems are tough and durable, providing protection against extreme weather conditions while maintaining an attractive appearance year after year.

We offer two tiers of high-quality color-systems both combining the corrosion protection of zinc with the added protection of long-lasting color coatings. Select the system that makes the most sense for your specific application.

PERMAFUSED® II Features a revolutionary polyolefin coating for superior performance and durability in highly corrosive environments. The coating's extreme flexibility reduces the chance of cracking and chipping even in changing weather conditions and it's backed by a 15-year limited warranty.

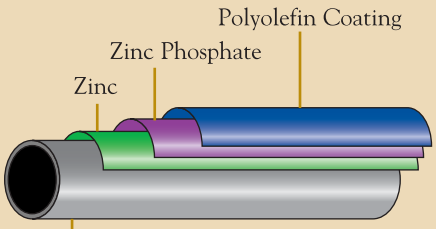
SPECTRA® Provides a cost-effective, quality solution for most applications. In addition to the corrosion protection of zinc, Spectra combines the durability of polyester-coated framework with the attractiveness of extruded polyvinyl chloride fabric all backed by a 12-year limited warranty.

MASTER HALCO®

Perfect surrounding for tennis courts, swimming pools, baseball fields, playgrounds, and golf courses.

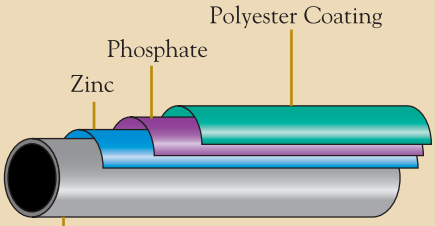
Coatings

Permafused II



Type 1 - Standard Weight Pipe (Sch. 40) or
Type 2 - High Yield/Tensile Strength Pipe (DQ 40)

Spectra



Type 2 - High Yield/Tensile Strength Pipe (DQ 40)

Colors

Permafused II

Sierra Brown | Midnight Black | Forest Green | Tan (Special Order) | Olive Green (Special Order)

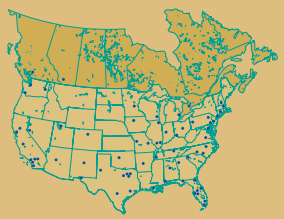
Spectra

Sierra Brown | Midnight Black | Forest Green

Note: Due to manufacturing variances and limitations in the production process, colors may vary from this brochure. Contact Master Halco for actual color samples.

Heritage & Commitment

Since 1961, Master Halco has grown to become the largest manufacturer and distributor of fencing materials in the world, servicing thousands of the best installers and retailers across the United States and Canada.



Master Halco operates from locations across North America, with a vast network of distribution centers supported by our delivery fleet.

Full Fencing Solutions

Master Halco distributes a broad range of fencing solutions for commercial and residential applications, including:

- Chain-link
- Ornamental fence (steel and aluminum)
- Welded wire
- Wood
- PVC
- Composite

For more information about Master Halco products and services, call 1.888.MH.FENCE toll-free or visit us online at **www.FenceOnline.com**.

MASTER HALCO®

4000 W. Metropolitan Dr., Suite 400
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1.888.MH.FENCE (toll-free)
e-mail: info@FenceOnline.com
www.FenceOnline.com

Fence Framework

AMERICAN METAL

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Wheatland Tube

Providing Quality Products and Service for Over 130 Years

Wheatland Tube is one of the largest high-volume national manufacturers of fence framework products.

We are the only manufacturer that produces the full range of pipe and tubing for all fence applications. Our Regular Grade Schedule 40 pipe was used as the original specification for all security and industrial fence framework. Today, we supply the broadest line of fence framework in the industry for projects involving high-security, industrial, commercial and residential applications. Our products are highly recognized for their superior strength, quality, and unparalleled range of sizes and protective coatings. We stock full inventories and we're the only supplier that offers mixed loads shipped on the same truck, providing our customers with additional savings on freight and the ability to consolidate purchase orders, invoices and payments.

Wheatland Tube will certify that all Wheatland fence framework is manufactured in the USA and is in compliance with applicable local, state and federal specifications. "MADE IN USA" is displayed on each length of fence pipe and tube. Made & Melted in America, Wheatland Tube's steel pipe and tube satisfy the strictest American Made, Made in America and Buy American Standards.

Galvanizing

Wheatland Tube is unique in that it can offer both hot-dip and in-line galvanized products that meet ASTM standards.

Recyclable

The steel used to produce Wheatland's fence framework contains recycled steel, which is the most recycled material in the world.

The tube products manufactured by Wheatland Tube are produced from approximately 25–85% recycled steel. The amount can vary depending on the steel producer. Of the 25–85% recycled steel, approximately 30% is post-industrial and 70% is post-consumer — depending on fluctuating scrap prices. The American Iron and Steel Institute (AISI) states, "Steel's recycling rate of 66% is far higher than that of any other material, capturing twice as much tonnage as all other materials combined."

Color Coatings

Wheatland's polyester TGIC powder-coated WT-ColorCoat (per ASTM F1043 in dark green, black or brown per ASTM F934) is applied over the galvanized exterior coatings to provide additional corrosion protection. WT-ColorCoat is available on WT-40, WT-20, WT-15, residential tubing and squares.

Value-added Services

Wheatland's goal is to continually work with our customers to educate them on our products and services and follow up to make sure that we are meeting their needs. Our customer service team is committed to building long-term partnerships that are based on high-quality deliverables. Our highly qualified technical team allows us to offer you the expertise in providing solutions for projects of various sizes. We make it our business to understand your business and your priorities. Wheatland offers the most extensive size range of any fence framework manufacturer, including swaged ends. We can ship all of our fence products on a single truckload, reducing deliveries and associated costs.

High-security, Security and Industrial Fence Framework

Schedule 40 per ASTM F1083, WT-40 per ASTM F1043

Applications — Prisons, military and secure government facilities, highways, bridge fencing, utility and water treatment plants, schools, public play and ball fields, border fence, chemical plants, sea ports, airports, framework and supports for solar panels — basically unlimited applications.

Schedule 40 per ASTM F1083

Wheatland F1083 is the original specified fence framework used for commercial, industrial and high-security applications. Wheatland is the leading supplier of ASTM F1083 full-weight Schedule 40 domestic fence framework. Wheatland manufactures all F1083 grades; Regular Grade 30,000 psi, High Strength 50,000 psi and Schedule 80. When the specification requires Schedule 40 pipe, Wheatland's F1083 is the clear choice. Our ISO 9001 certified CW facility produces the finest Schedule 40 products in the world and is supported by over 130 years of experience delivering prompt, knowledgeable and personalized service.

- Meets or exceeds the requirements of ASTM F1083
- Meets or exceeds the requirements of ASTM F1043, Group 1A
- Full-weight Schedule 40 wall thickness
- Schedule 40 per ASTM F1083 is pure zinc hot-dip galvanized 1.8 oz./ft^2 outside, and 1.8 oz./ft^2 inside (2.0 oz./ft^2 available)
- Intermediate pretreatment inside and outside for additional protection
- The only Schedule 40 pipe coated with virtually lead-free galvanizing
- Most extensive size range of any fence framework product, 1⅜"–8⅝" OD

Certification

Wheatland Tube will certify that all Wheatland F1083 fence pipe is manufactured in the USA and is in compliance with applicable local, state and federal specifications. "WHEATLAND USA ASTM F1083" is proudly displayed on each length of F1083 pipe.

Specifying Agencies

- American Association of State Highway and Transportation Officials (AASHTO) M181 — Grade 1
- Federal specifications RR-F-191/2E and RR-F-191/3E
- U.S. Army Corps of Engineers UFGS-32 31 13
- Department of the Navy
- Department of Transportation
- Federal Aviation Administration AC 150/5370-10 Item 162
- U.S. Department of Justice — Federal Bureau of Prisons
- ASTM Specification F1043, Group 1A, Standard Specification for Strength and Protective Coatings
- American Institute of Architects (AIA) MasterSpec®
- ASTM Specification F1083

F1083 Tables

ASTM F1083 Regular Grade 30,000 PSI Yield
Schedule 40 Pipe — Dimensions and Strength Characteristics

FENCE INDUSTRY	DECIMAL OD EQUIVALENT		PIPE WALL THICKNESS		WEIGHT		SECTION MODULUS		X	MIN. YIELD STRENGTH		=	MAX. BENDING MOMENT	CALCULATED LOAD (LBS.)		
															Cantilever	
OD	in.	(mm)	in.	(mm)	lb./ft.	(kg/m)	in.³	(mm³)	x	psi	(MPa)	=	lb./in.	10' Free Supported	4'	6'
1⅜"	1.315	33.40	0.133	3.38	1.68	2.50	0.1328	3.37	x	30000	205	=	3985	133	83	55
1⅝"	1.660	42.16	0.140	3.56	2.27	3.38	0.2346	5.96	x	30000	205	=	7038	235	147	98
1⅞"	1.900	48.26	0.145	3.68	2.72	4.05	0.3262	8.29	x	30000	205	=	9786	326	204	136
2⅜"	2.375	60.33	0.154	3.91	3.65	5.43	0.5606	14.24	x	30000	205	=	16819	561	350	234
2⅞"	2.875	73.03	0.203	5.16	5.80	8.62	1.0640	27.03	x	30000	205	=	31921	1064	665	443
3½"	3.500	88.90	0.216	5.49	7.58	11.28	1.7241	43.79	x	30000	205	=	51723	1724	1078	718
4"	4.000	101.60	0.226	5.74	9.12	13.56	2.3939	60.80	x	30000	205	=	71816	2394	1496	997
4½"	4.500	114.30	0.237	6.02	10.80	16.07	3.2145	81.65	x	30000	205	=	96435	3214	2009	1399
*5⁹⁄₁₆"	5.563	141.30	0.258	6.55	14.63	21.77	5.4511	138.46	x	35000	240	=	190789	6359	3975	2650
*6⅝"	6.625	168.28	0.280	7.11	18.99	28.23	8.4958	215.79	x	35000	240	=	297353	9912	6195	4130
*8⅝"	8.625	219.08	0.322	8.18	28.58	42.49	16.8091	426.95	x	35000	240	=	588319	19610	12257	8171

**Manufactured to ASTM A53 specifications; exceeds F1083 requirements.*

ASTM F1083 High Strength Grade 50,000 PSI Yield
Schedule 40 Pipe — Dimensions and Strength Characteristics

FENCE INDUSTRY	DECIMAL OD EQUIVALENT		PIPE WALL THICKNESS		WEIGHT		SECTION MODULUS		X	MIN. YIELD STRENGTH		=	MAX. BENDING MOMENT	CALCULATED LOAD (LBS.)		
															Cantilever	
OD	in.	(mm)	in.	(mm)	lb./ft.	(kg/m)	in.³	(mm³)	x	psi	(MPa)	=	lb./in.	10' Free Supported	6'	15'
1⅝"	1.660	42.16	0.140	3.56	2.27	3.38	0.2346	5.96	x	50000	345	=	11730	392	163	65
1⅞"	1.900	48.26	0.145	3.68	2.72	4.05	0.3262	8.29	x	50000	345	=	16310	543	227	91
2⅜"	2.375	60.33	0.154	3.91	3.65	5.43	0.5606	14.24	x	50000	345	=	28030	935	389	156
2⅞"	2.875	73.03	0.203	5.16	5.80	8.62	1.0640	27.03	x	50000	345	=	53200	1773	739	296
3½"	3.500	88.90	0.216	5.49	7.58	11.28	1.7241	43.79	x	50000	345	=	86205	2873	1197	479
4½"	4.500	114.30	0.237	6.02	10.80	16.07	3.2145	81.65	x	50000	345	=	160725	5357	2232	893
5⁹⁄₁₆"	5.563	141.30	0.258	6.55	14.63	21.77	5.4511	138.46	x	50000	345	=	272555	9085	3785	1514
6⅝"	6.625	168.28	0.280	7.11	18.99	28.23	8.4958	215.79	x	50000	345	=	424790	14160	5900	2360
8⅝"	8.625	219.08	0.322	8.18	28.58	42.49	16.8091	426.95	x	50000	345	=	840455	28015	11673	4669

Please contact Fence Sales for mill run schedule. Minimum order quantities may be required.
Specifications, illustrated material and descriptions are accurate as known at time of publication and are subject to change without notice.

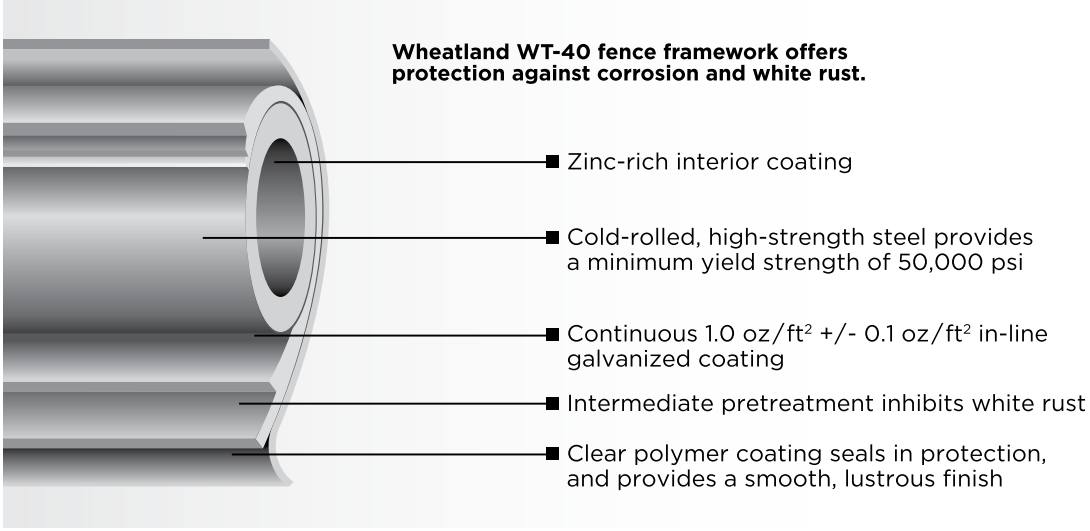
WT-40 per ASTM F1043, Group 1C

Wheatland Tube will certify that all Wheatland WT-40 pipe is manufactured in the USA and is in compliance with applicable local, state and federal specifications. To ensure 100% ASTM compliance and to provide full traceability, each length of pipe is clearly marked every 16–18" with the following information:

WT-40 | WHEATLAND | MADE IN USA | ASTM F1043 | OD | RUN NUMBER | MILL NUMBER | YEAR | DATE | TIME

High-strength Spec Fence Framework

The strength and corrosion characteristics of Wheatland WT-40 fence pipe have been tested, documented and certified by independent testing agencies to ensure complete compliance with ASTM F1043, Group IC, and AASHTO M181. Wheatland WT-40 fence framework meets or exceeds the most demanding specifications and codes imposed by private, independent and government agencies.



Available with WT-ColorCoat:

Materials

1. **Steel** — Steel strip used in the manufacture of Wheatland WT-40 fence pipe shall conform to ASTM A1011 and will meet or exceed all performance criteria set forth in this standard specification.
2. **Zinc** — Zinc used in Wheatland WT-40 fence pipe shall conform to ASTM B6.
3. **Intermediate Pretreatment** — An intermediate pretreatment shall be applied in-line to inhibit white rust and enhance corrosion resistance.
4. **Clear Polymer Coating** — A clear polymer coating shall be applied over the intermediate pretreatment. This polymer coating provides a smooth, lustrous protective finish.
5. **Heat-set Internal Coating** — A heat-set zinc-rich ID coating.

Weight of Coatings

1. **Zinc** — Weight of zinc shall be 1.0 oz./ft.² +/- 0.1 oz./ft.² and shall be determined by the method described in ASTM A90.
2. **Intermediate Pretreatment** — Intermediate pretreatment shall be 30 micrograms/in.² +/- 10 micrograms/in.² and shall be determined by a strip and weigh method utilizing an atomic absorption spectrophotometer or X-ray fluorescence spectrograph.
3. **Polymer Coating** — Thickness of the clear polymer coating shall be 0.5 mils +/- 0.2 mils and shall be determined by measurement with a suitable magnetic or eddy current coating thickness tester.

Strength Characteristics

1. **Load Strength** — The strength of line, end, corner and pull posts shall be determined by the use of 4' or 6' cantilevered bend test. The top rail shall be determined by a 10' free-supported beam test.
2. **Bending Moment** — Pipe strength may be determined via the alternative method of calculating bending moment. (See table.) Conformance can be demonstrated by measuring the yield strength multiplied by the section modulus. The yield strength shall be determined according to the methods described in ASTM E8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength.

Corrosion Resistance

1. Salt Spray

a. *Exterior Surface* — The exterior clear polymer coating shall have a demonstrated ability to resist 1,000 hours or more of exposure to salt fog with a maximum of 5% red rust. Tests shall be conducted in accordance with ASTM B117.

b. *Interior Surface* — The interior zinc-rich surface coating shall withstand no less than 650 hours of exposure to salt fog with a maximum of 5% red rust. Tests shall be conducted in accordance with ASTM B117.

2. Humidity — The exterior clear polymer coating of Wheatland WT-40 fence pipe shall resist 500 hours of exposure to 100% relative humidity without signs of blistering or peeling. Tests shall be performed in accordance with ASTM D4585 (D2247).

3. Weatherometer — The clear polymer coating of Wheatland WT-40 fence pipe shall resist failure for no less than 500 hours at a black panel temperature of no less than 145° F. Tests shall be performed in accordance with ASTM G155 Xenon Type BH apparatus (formerly G26) or ASTM G153 Carbon ArcType HH apparatus (formerly G23).

Specifying Agencies

- American Association of State Highway and Transportation Officials (AASHTO) M181 — Grade 2
- Federal specifications RR-F-191/2E and RR-F-191/3E
- U.S. Army Corps of Engineers UFGS-32 31 13
- Department of the Navy
- Federal Highway Administration
- Federal Aviation Administration AC 150/5370-10 Item 162
- U.S. Department of Justice — Federal Bureau of Prisons
- ASTM Specification F1043, Group IC, Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
- American Institute of Architects (AIA) MasterSpec

WT-40 Dimensions and Strength Characteristics

FENCE INDUSTRY	DECIMAL OD EQUIVALENT		PIPE WALL THICKNESS		WEIGHT		SECTION MODULUS		X	MIN. YIELD STRENGTH		=	MAX. BENDING MOMENT	CALCULATED LOAD (LBS.)		
															Cantilever	
OD	in.	(mm)	in.	(mm)	lb./ft.	(kg/m)	$in.^3$	(mm^3)	x	psi	(MPa)	=	lb./in.	10' Free Supported	4'	6'
1⅝"	1.660	42.16	0.111	2.82	1.84	2.74	0.1962	4.98	x	50000	345	=	9810	327	204	136
1⅞"	1.900	48.26	0.120	3.05	2.28	3.39	0.2810	7.14	x	50000	345	=	14050	468	293	195
2⅜"	2.375	60.33	0.130	3.30	3.12	4.64	0.4881	12.40	x	50000	345	=	24405	814	508	339
2⅞"	2.875	73.03	0.160	4.06	4.64	6.91	0.8778	22.30	x	50000	345	=	43890	1463	914	610
3½"	3.500	88.90	0.160	4.06	5.71	8.50	1.3408	34.06	x	50000	345	=	67042	2235	1397	931
4"	4.00	101.60	0.160	4.06	6.56	9.76	1.7820	45.26	x	50000	345	=	89098	2970	1856	1237

6⅝" and 8⅝" full-weight Schedule 40 per ASTM F1083 is available for terminal post applications.

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

4435 S. Western Boulevard
Chicago, IL 60609

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Long Beach, CA 90810

800.257.8182
info@wheatland.com
wheatland.com

Zekelman Industries

Corporate Office
227 West Monroe Street
Suite 2600
Chicago, IL 60606

312.275.1600
info@zekelman.com
zekelman.com

About Wheatland Tube

Wheatland Tube, a division of Zekelman Industries, produces a wide range of steel tubular products, including standard steel pipe, galvanized mechanical tubing, fence framework, fire sprinkler pipe, electrical conduit, elbows, couplings and nipples.

For more information, contact Wheatland Tube at:
800.257.8182 or **info@wheatland.com**
Or, visit our website at wheatland.com

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- wheatland.com/blog

5/13/2025

MASTER HALCO™

ISLANDWIDE FENCING, INC.
869 Kanoelehua Ave
Hilo, Hawaii, 96720

RE: Hilo WWTP Rehabilitation and Replacement Project Phase 1

CERTIFICATE OF COMPLIANCE

Please consider this letter as certification that the Pipe & Chainlink provided to Islandwide Fencing for their project named above will meet or exceed the specifications listed below:

Posts and Framework DQ40 Group 1C:
Cold formed and welded steel pipe complying with ASTM F 1043, Group IC, with minimum yield strength of 50,000 psi (344 MPa), sizes as indicated. Protective coating per ASTM F 1043, external coating Type B, zinc with organic overcoat, 0.9 oz/ft² (270 g/m²) minimum zinc coating with chromate conversion coating and verifiable polymer film. Internal coating Type D. In addition, this pipe was made in the USA.

This pipe will meet or exceed
- ASTM F1043 Group 1C
- A569 replaced now by A1011 with maximum carbon content of 0.15%
- Federal Specification: RR-F191/3E Class 1 Grade B
- Federal Aviation Specification: FAA-162-2.3
- AASHTO M181-Grade 2

Chainlink Fabric Permafused:
Polyolefin coating, 6 mil (.015mm) to 10 mil (.025mm) thickness, thermally fused to zinc coated steel core wire: 9C/8F Per ASTM F668 Class 2B. Minimum Core wire tensile strength of 75,000 psi (517 MPa) and meets the requirements of Master Halco Permafused-II.

Albert Gonzales - BR001 Los Angeles, CA
Inside Sales Representative

27474 5th Street, Highland, CA 92346
Phone: (909) 350-4740 ~ Fax: (909) 697-2795

TECHNICAL DATA SHEET:

PRODUCT DESCRIPTION

85% GPS *is composed of PE knitted net, suitable for any kind of fence or shade application. The density knitting process provides the fence screen with 90% blockage while allowing air and breese to go thorugh freely.Wide reinforced black bindings (HEM) are tear-resistant. Premium brass grommets are basically spaced around the perimeter of the screen in 6",12",18" & 24" O.C. options. Easy to install and wide variety of attachability options (cable ties, hog rings, wire, rope, nails, staples).*
Compatible with wire fence, wooden palisades, chain link fence, railings and huddles. Applciations: residential privacy screen, swimming pool privacy, pergola shade, construction site screen, plant nursery area, etc.

FEATURES & SPECIFICATIONS

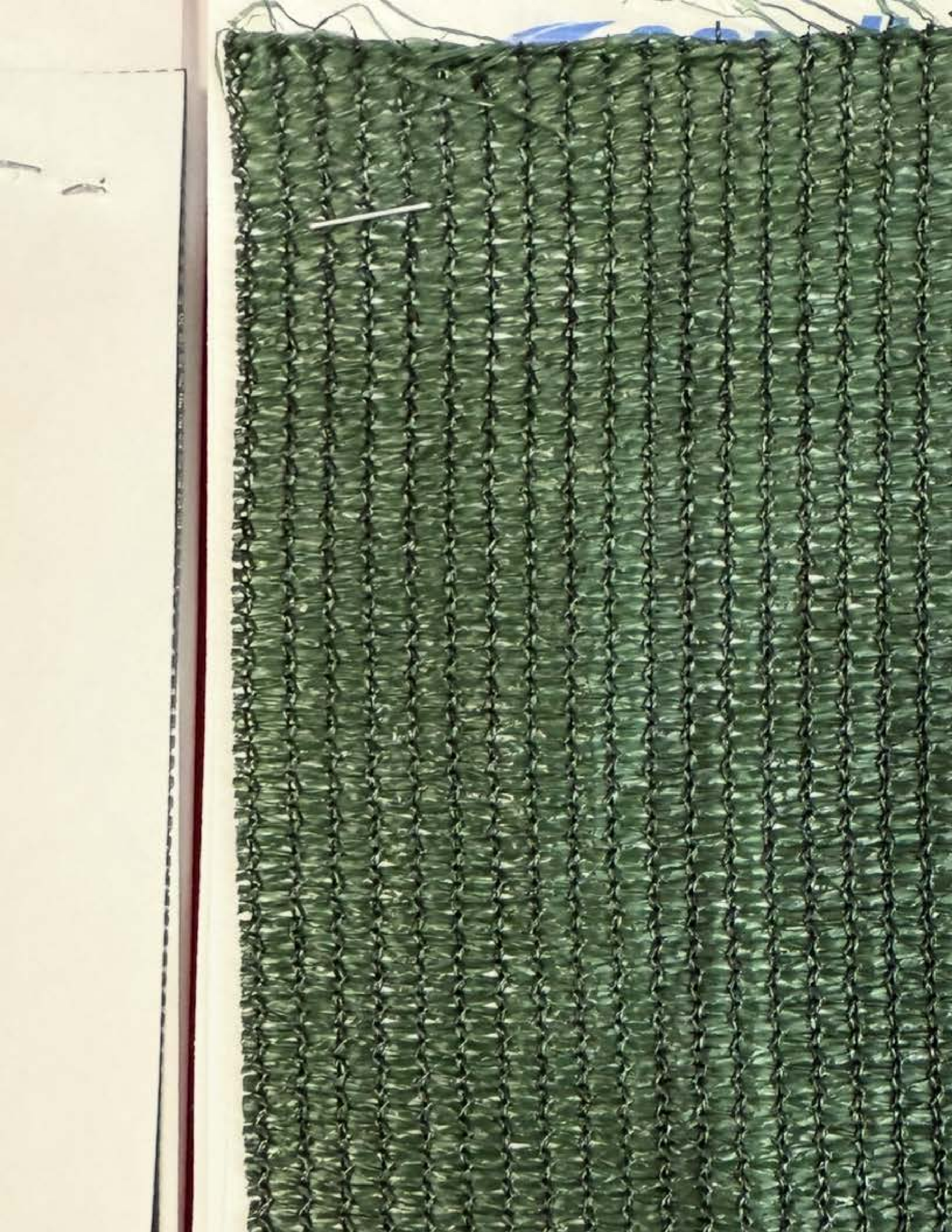
- *Finishing: Taped & Grommeted*
- *Easy to Install*
- *UV Inhibitor*
- *Multiple Fabric Colors*
- *Stock panels:* ***5'-8"H & 7'-8"H*** *X 50'W*
- *Digital Print Available*
- *3 Year Warranty*

85% Green Privacy Screen

Technical Data Sheet

Available Heights: **CUSTOM SIZES AVAILABLE**	**6', 8' & 10'**
Sight Blockage:	**90%**
Weight (oz/yd2):	**4.9 oz/yd2**
Construction:	**KNIT**
Fiber Content:	**PE**
Tear Strength:	**Warp: 146lbs. / Fill: 124lbs.**
Bursting Strength:	**210 psi**
Treatments:	**UV Inhibitor**

Per our vendor it matches or exceeds FenceScreen Series 350
See photo of sample on next page.



SECTION 02820

FENCES AND GATES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Fence, framework, fabric, and accessories.
   2. Excavation for post bases and concrete foundation for posts.
   3. Manual gates and related hardware.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
   2. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   4. A385 - Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
   5. A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
   6. A702 - Standard Specification for Steel Fence Posts and Assemblies, Hot-Wrought.
   7. F626 - Standard Specification for Fence Fittings.
   8. F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
   9. F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework.
   10. F1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates.

1.03 SUBMITTALS

A. Product data: Submit data completely describing products.

B. Shop drawings:
   1. Remote and automatic gates: Submit drawings showing connection details indicating methods and means of mounting, attaching, and installing operators and locks to gates, including wiring diagrams.

C. Quality control submittals:
   1. Certificates of compliance: Provide certification that materials conform to referenced specifications.
   2. Qualifications: Provide installer's references and list of local references.

1.04 QUALITY ASSURANCE

A. Pre-installation conference: Participate in conference, if required.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and handling: Unload, store, and protect materials such that they are not damaged.

1.06 PROJECT CONDITIONS

A. Field measurements:
   1. Verify actual field distances so that post spacing can be made uniform.
   2. Verify and coordinate gate opening and column distances for driveway.

1.07 SEQUENCING AND SCHEDULING

A. Fences and gates: construct as soon as practical after earthwork, pipe work, and structures to which fence is related has been completed, but prior to erosion control application.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chain link fence and gates: One of the following or equal:
   1. Allied Tube and Conduit.
   2. Master-Halco.

B. Privacy/Wind screen: One of the following or equal:
   1. FenceScreen – 350 series.

2.02 MATERIALS

A. Chain link fence:
   1. Fabric:
      a. Height:
         1) Plant fence: 6 feet 0 inch.
      b. Mesh: 2 inches.
      c. Size wire: 9 gauge:
         1) Coating: Zinc coating, ASTM A392, Class 1. Smoothed after coating and then coated per ASTM F668 with green vinyl.
         2) Tensile strength: 80,000 pounds per square inch minimum.

2. Framework: In accordance with ASTM F1043 Group 1A or 1C. Pipe shall be straight and conform to the following weights:

Pipe Size Outside Diameter (Inches)	Group IA Weight (Lbs/ft)	Group IC Weight (Lbs/ft)
1-5/8	2.27	1.84
1-7/8	2.72	2.28
2-3/8	3.65	3.12
2-7/8	5.79	4.64
3-1/2	7.58	5.71
4	9.11	6.56
6-5/8	18.97	-
8-5/8	24.70	-

a. Top rail:
   1) Size: 1-5/8 inches outside diameter.

b. Bottom rail:
   1) Tension wire: 7-gauge galvanized coil spring wire.

c. Line posts:
   1) Size: 2-3/8-inch outside diameter.

d. Terminal, corner, and pull posts:
   1) Size: 2-7/8-inch outside diameter.

e. Coatings:
   1) Group IA: External coatings in accordance with ASTM F1043 Type A; internal coatings in accordance with ASTM F1043 Type A.
   2) Group IC: External coatings in accordance with ASTM F1043 Type B; internal coatings in accordance with ASTM F1043 Type D.

3. Accessories:

a. Fence fittings: In accordance with ASTM F626:
   1) Post top fittings:
      a) Provide post caps that fit snugly over posts to exclude moisture. Provide dome style caps for terminal posts and loop style caps for line posts.
   2) Rail and brace ends: Provide pressed steel or malleable castings that are cup shaped to receive rail and brace ends.

b. Fabric accessories:
   1) Wire clips: Minimum 6 gauge hot-dip galvanized.
   2) Tension bars: 1/4 inch by 3/4 inch, galvanized.
   3) Steel bands: 11 gauge, 1 inch wide, hot-dip galvanized.
   4) Bolts and nuts: 3/8-inch diameter.
   5) Hog rings: 11 gauge.

B. Chain link gates:

1. Gate posts and concrete foundations for gate posts: Except where differently indicated on the Drawings, determine gate posts and concrete foundations for gate posts in accordance with following schedule:

Gate Leaf Widths (Feet)	Gate Posts	Foundations	
	Post O.D. ASTM F1043 Group IA or IC (Inches)	Diameter (Inches)	Depth (Feet)
0 to 6	2-7/8	12	4
Over 6 to 13	4	18	4
Over 13 to 18	6-5/8 (Group IA)	18	4
Over 18 to 25	8-5/8 (Group IA)	18	4.5

2. Chain link gates:
   a. Frames and center supports: 1-7/8-inch outside diameter galvanized steel pipe that in accordance with ASTM F1043 Group IA.
   b. Gate accessories:
      1) Post top fittings:
         a) Provide post caps that fit snugly over posts to exclude moisture.
         b) Provide dome style caps for terminal posts and loop style caps for line posts.
      2) Corner fittings: Heavy pressed steel or malleable castings.
      3) Gate tensioning:
         a) Cross tensioning rods: 3/8 inch, galvanized.
         b) Turnbuckles: Heavy duty.
      4) Tension rods for 4-foot gates: 3/8 inch, easily adjustable, galvanized.
      5) Gate frame corner fittings: Fitting designed for purpose, Manufacturer's standard.
      6) Horizontal gate stiffeners: 1-5/8-inch outside diameter galvanized steel pipe that in accordance with ASTM F1043 Group IA or IC.
      7) Gate hardware:
         a) Catch and locking attachment: Combination steel or malleable iron catch and locking attachment of acceptable design.
         b) Stops:
            (1) Type 1: Capable of holding gates open.
            (2) Type 2: Center rest with catch.
         c) Color: Match color of fabric.
      8) Rolling gate hardware:
         a) Heavy-duty industrial hardware.
         b) Carrier wheels: double, 6-inch minimum, patterned rubber tires with stainless steel axles and hardware.
         c) Two each galvanized steel pipe tracks with 2 contoured bronze track rollers with stainless steel axles and hardware per track.
         d) Locking brackets on the track rollers.
         e) Roller or ball bearings on rotating parts.
         f) Galvanized steel latching mechanism for padlock.

C. Privacy/Wind Screen:
1. Provide as an accessory for chain link fence and chain link gate when indicated on the Drawings.
2. Material: PVC Mesh – 90 percent opacity minimum.
3. Color: Selected by Owner.
4. Size and dimensions: Size to match fence/gate height and width as indicated on the Drawings.
5. Install grommets along screen edge at 24 inches on center intervals.
6. Provide design for Engineers approval prior to installation.

2.03 FABRICATION

A. Shop finishing:
1. Galvanizing: For items not fabricated of galvanized materials hot-dip galvanize products after fabrication in accordance with following as applicable:
   a. ASTM A123.
   b. ASTM A153.
   c. ASTM A385.
2. Mark galvanized products with name of galvanize, applicable ASTM designation, and weight of zinc coating.
3. Galvanize fabricated items complete, or in largest practicable sections.
4. Provide galvanizing at rate of 2.0 ounces per square foot, minimum.
5. Hardware:
   a. Padlocks: Owner will provide final padlocks.
   b. Chain: Galvanized.

B. Finish schedule:
1. Ferrous metal:
   a. Typical: Clean, then hot-dip galvanize in accordance with galvanizing standards.

C. Field finish touch-up painting:
1. Galvanized repair paint: Apply paint having minimum dry film thickness of 2.0 to 3.5 mils.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of conditions: Verify field conditions prior to construction.

3.02 PREPARATION

A. Surface preparation:
1. Before locating fence posts grade ground to permit grade of fence to remain constant over any local elevations or depressions in ground line.

3.03 INSTALLATION

A. Chain link fences and gates:
   1. General:
      a. Install chain link fence and gates as indicated on the Drawings and specified in this Section.
      b. Provide fence systems that are plumb, taut, true to line and grade, and complete in details.
      c. Install fencing to generally follow finish grade of ground and provide pull posts at points where required to conform to change in grade.
      d. Install fencing such that space between bottom of fence and finish ground line does not exceed 3 inches.
   2. Concrete foundation for fence posts:
      a. Set fence posts in concrete foundations, that extend at least 3 feet into ground, and space posts not over 10 feet apart.
      b. Provide concrete foundations having minimum of 10 inches in diameter for line posts and minimum 12 inches in diameter for corners and gates.
      c. Provide foundations that extend minimum of 1 inch above finish grade and have tops that are shaped to slope to drain away from posts.
      d. Trowel finish tops of footings, and slope or dome to direct water away from posts.
      e. Set keepers, stops, sleeves, tracks, eye bolts, and other accessories into concrete as required.
      f. Wheel rolling area for sliding gates shall be steel-trowel smooth finish concrete.
   3. Post bracing:
      a. End corner, pull, and gate posts: Brace with same material as top rail and trussed to line posts with 3/8-inch rods and tighteners.
      b. Bracing end, corner, slope, and gate posts:
         1) Brace to midpoint of nearest line post or posts with horizontal braces used as compression members.
         2) Then from such line posts truss from brace back to bottom of end, corner, slope, or gate post with 3/8-inch steel truss rods with turnbuckles or other suitable tightening devices used as tension members.
   4. Top rail:
      a. Unless otherwise specified or indicated on the Drawings, install fencing with top rail and bottom tension wire.
   5. Fabric:
      a. Place fabric on outward facing side of the posts and install so that top edge projects over top rail of fence.
         1) Fabric selvage: Knuckled at top and bottom.
      b. Stretch fabric taut and securely fasten to posts, top rail, and bottom tension wire.
      c. Install tension wire parallel to line of fabric.
      d. Fabric: Connect fabric to:
         1) Line posts with wire clips minimum every 14 inches.
         2) Terminal, corner, and gate posts with tension bars tied to posts minimum 14 inches on center and with steel bands and bolts and nuts.
         3) Tension wires with hog rings minimum 24 inches on center.

6. Post top fittings: Provide post tops without extension arms.

B. Privacy/Wind Screen:
   1. General:
      a. Install privacy/wind screen as indicated on the Drawings and specified in this Section.
   2. Screen:
      a. Place screen on outward facing side of the fence.
      b. Stretch screen taut and securely fasten to posts, top rail, and bottom tension wire per manufacturer's recommendation.
      c. Connect to fence through preinstalled grommets on screen edge. Attach with standard nylon fasteners or galvanized hog rings.

3.04 CLEANING

A. Clean up surplus dirt, concrete, and other waste material and dress grade up upon completion of the work.

3.05 PROTECTION

A. Protect installed fences and gates against damage and, if damaged, repair prior to final acceptance.

END OF SECTION