

September 23, 2021 (*Revised November 2, 2021*)

Columbia County Land Development Services  
Attention: Robert Wheeldon  
230 Strand Street  
St. Helens, OR 97051

Re: **NEXT Renewable Fuels Site Design Review DR 21-03 and Variance V 21-05**  
*Supplemental Fence Height Variance Evidence*  
Project Number 2200315.00

Dear Robert:

In response to your request for additional evidence to support an 8-foot-tall fence at the proposed renewable diesel production facility at Port Westward Industrial Park, we have provided the following information. As noted in the narrative, the applicant is proposing eight-foot fencing (seven feet of chain link topped by one foot of barbed wire per ASTM F2611-15).

The proposed facility is required to conform to the Chemical Facility Anti-Terrorism Standards (CFATS), a risk-based performance standard issued by the Cybersecurity & Infrastructure Security Agency (CISA) within the U.S. Department of Homeland Security. CISA states that “The Cybersecurity and Infrastructure Security Agency’s (CISA) Chemical Facility Anti-Terrorism Standards (CFATS) program identifies and regulates high-risk chemical facilities to ensure security measures are in place to reduce the risk of certain hazardous chemicals being weaponized” and notes that “The CFATS regulation applies to facilities across many industries—chemical manufacturing, storage, and distribution, energy and utilities, agriculture and food, explosives, mining, electronics, plastics, universities and laboratories, paint and coatings, and healthcare and pharmaceuticals, among others.”<sup>1</sup> The May 2009 *Risk-Based Performance Standards Guidance: Chemical Facility Anti-Terrorism Standards* publication, issued by the Infrastructure Security Compliance Division, Cybersecurity and Infrastructure Security Agency,<sup>2</sup> identifies fencing as a physical security measure, noting that:

*Perimeter barriers reduce the likelihood of unauthorized persons accessing the facility for malicious purposes such as theft, sabotage, or intentional release of chemicals of interest. By securing and monitoring the perimeter of the facility, facility personnel can more easily and effectively control who enters and leaves the facility, both on foot and in vehicles, and are better able to detect, delay, defend against, and respond to individuals or groups who seek unauthorized access to the facility. A well-secured perimeter additionally will help to deter intruders from seeking to gain access to the facility or from launching attacks from the area immediately outside a facility’s perimeter.*

As CFATS is a performance-based standard rather than a prescriptive standard, individuals typically pursue compliance by implementing best practices developed by industry experts. As a renewable diesel production facility, NEXT Renewable Fuels will rely on publications such as the *Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries*.<sup>3</sup> This document categorizes 6-foot fences as “Low Security Level,” which is the same level as

<sup>1</sup> <https://www.cisa.gov/chemical-facility-anti-terrorism-standards>

<sup>2</sup> [https://www.cisa.gov/sites/default/files/publications/cfats-rbps-guidance\\_508.pdf](https://www.cisa.gov/sites/default/files/publications/cfats-rbps-guidance_508.pdf)

<sup>3</sup> Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries, American Petroleum Institute and National Petrochemical & Refiners Association May 2003, <https://www.nrc.gov/docs/ML0502/ML050260624.pdf>



having no fencing. By contrast, an 8-foot fence is categorized as “Moderate to High Security Level.” Historically, refineries utilized 6-foot-high chain link fencing, but after the 9/11 terrorist attacks, new security programs were developed (including CFATS). Through the practice of facility security reviews, refineries switched to using 8-foot fencing as an improved security measure. This document also notes that when evaluating facility security, operators should identify whether the fence line is “clear of vegetation, trash, equipment, and other objects that could impede observation” as clear sight lines improve security. As a result, the applicant has requested a variance to eliminate the continuous evergreen hedge normally required with chain link fencing.

Based on the CFATS performance standards and best practices recommended by industry experts, the applicant is proposing to construct an 8-foot fence at Port Westward. We have enclosed specifications and details for the type of fencing that are typically used at such facilities. Within the plans submitted with the land use application, Sheet C1.11 provides a detail of the fencing proposed for this site.

Thank you for the opportunity to clarify the rationale for the proposed fence height.

Sincerely,



Brian Varricchione  
Land Use Planner

Enclosure(s): PIP CVS02830 Chain Link Fence and Gates Installation Specification  
Typical Fencing Details

c: Christopher Efird, Gene Cotten – NEXT Renewable Fuels  
Garrett Stephenson – Schwabe, Williamson & Wyatt



PROCESS  
INDUSTRY  
PRACTICES

COMPLETE REVISION  
*December 2016*

***Civil***

**PIP CVS02830  
Chain Link Fence and Gates  
Installation Specification**

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## PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

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### **PUBLISHING HISTORY**

May 2003      *Issued*  
January 2010    *Complete Revision*  
December 2016   *Complete Revision*

Not printed with State funds



## PIP CVS02830 Chain Link Fence and Gates Installation Specification

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## 1. Scope

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This Practice provides requirements for providing and installing heavy industrial chain link fences and gates.

This Practice covers materials, fabrication, and installation of heavy industrial chain link fencing using galvanized steel and polymer-coated steel.

## 2. References

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Applicable parts of the following industry codes and standards shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

### 2.1 Process Industry Practices (PIP)

- PIP ELIGD000 - *Grounding Installation Details*

### 2.2 Industry Codes and Standards

ASTM International (ASTM)

- ASTM A121 - *Standard Specification for Metallic-Coated Carbon Steel Barbed Wire*
- ASTM A392 - *Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric*
- ASTM A824 - *Standard Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link Fence*
- ASTM C94/C94M - *Standard Specification for Ready-Mixed Concrete*
- ASTM F567 - *Standard Practice for Installation of Chain-Link Fence*
- ASTM F626 - *Standard Specification for Fence Fittings*
- ASTM F668 - *Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric*
- ASTM F900 - *Standard Specification for Industrial and Commercial Steel Swing Gates*
- ASTM F934 - *Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials*
- ASTM F1043 - *Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework*
- ASTM F1083 - *Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures*
- ASTM F1184 - *Standard Specification for Industrial and Commercial Horizontal Slide Gates*
- ASTM F1664 - *Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence*

- ASTM F1665 - *Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used With Chain-Link Fence*
- ASTM F1910 - *Standard Specification for Long Barbed Tape Obstacles*
- ASTM F1911 - *Standard Practice for Installation of Barbed Tape*
- ASTM F2200 - *Standard Specification for Automated Vehicular Gate Construction*
- ASTM F2611 - *Standard Guide for Design and Construction of Chain Link Security Fencing*

### 3. Definitions

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*contract documents*: Any and all documents, including codes, studies, design drawings, specifications, sketches, practices, and data sheets, that purchaser has transmitted or otherwise communicated, either by incorporation or reference, and made part of the legal contract agreement or purchase order between purchaser and supplier.

*engineer of record*: Purchaser's authorized representative with overall authority and responsibility for engineering design, quality, and performance of civil works, structures, foundations, materials, and appurtenances described in contract documents. Engineer of record shall be licensed as defined by laws of the locality in which the work is to be constructed, and be qualified to practice in the specialty discipline required for the work described in contract documents.

*manufacturer*: Party who produces and warrants the performance of materials provided in accordance with contract documents. Materials are manufactured in a controlled process using standard codes, specifications, tests and possibly include shop drawings to assist in proper application, installation and/or use. The term manufacturer shall apply also to manufacturer's subcontractor(s) and/or vendor(s).

*owner*: Party who has authority through ownership, lease, or other legal agreement over facility wherein fencing will be used.

*purchaser*: Party who awards contract to supplier. Purchaser may be owner or owner's authorized agent.

*supplier*: Party responsible for furnishing materials and performing fence installation in accordance with contract documents.

### 4. Requirements

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#### 4.1 General

- 4.1.1 Constructor shall furnish all equipment, tools, materials, labor, and supervision and shall perform all operations necessary for installation of fences and gates, where indicated by contract documents.
- 4.1.2 Any conflicts or inconsistencies between this Practice, design drawings, manufacturer's specifications and recommendations, and other contract

documents shall be brought to the attention of purchaser for resolution before the work begins.

- 4.1.3 Fences and gates designated in contract documents for high security applications shall also be in accordance with *ASTM F2611*.

## **4.2 Quality Control**

- 4.2.1 Constructor shall be solely responsible for quality control of all constructor-provided materials, installations, and workmanship, including those items or installations provided by any of constructor's subcontractors or vendors.
- 4.2.2 Physical locations of features such as fence lines, gates, and terminal posts shall be in accordance with contract documents.

## **4.3 Quality Assurance**

Purchaser reserves the right to make inspections at any time during receipt and installation of fencing materials.

## **4.4 Submittals**

- 4.4.1 Before start of field installation, shop drawings of gates, bracing, and typical fence details shall be submitted to purchaser for approval.
- 4.4.2 Before start of installation, material data for fabrics, posts, rails, tension wire, and rods showing compliance with this Practice shall be submitted to purchaser.

## **4.5 Materials**

### **4.5.1 Storage and Protection**

- 4.5.1.1 Materials shall be stored a minimum of 4 inches (100 mm) above grade by using wood blocking or other approved materials. Avoid areas prone to flooding.
- 4.5.1.2 Materials shall be stored in areas of the job site designated and approved by purchaser.

### **4.5.2 Galvanized Chain Link Steel Fence**

If galvanized fence is specified in contract documents, materials shall be uniform and consistent and shall be in accordance with the following requirements:

#### **4.5.2.1 Fabric**

Fabric shall consist of galvanized chain link material, in accordance with *ASTM A392*, Class 2, 2-inch (50-mm) mesh 9-gage (0.148 inches [3.76 mm] in diameter) steel wire, with top and bottom selvages twisted and barbed.

#### **4.5.2.2 Line Posts**

Line post size for chain link fence framework shall be in accordance with *ASTM F1043* for Heavy Industrial Fence.

1. For fabric less than or equal to 8 feet (2.4 m) high, line posts shall be NPS 2 (DN 50) Standard Weight (Schedule 40) galvanized steel pipe



(OD = 2.375 inches [60.3 mm]) in accordance with *ASTM F1083* unless otherwise specified in contract documents.

2. For fabric greater than 8 feet (2.4 m) and up to 12 feet (3.6 m) high, line posts shall be NPS 2.5 (DN 65) Standard Weight (Schedule 40) galvanized steel pipe (OD = 2.875 inches [73.0 mm]), in accordance with *ASTM F1083* unless otherwise specified in contract documents.

#### **4.5.2.3 Corner, Pull, and Terminal Posts**

Corner, pull, and terminal posts shall be NPS (DN) Standard Weight (Schedule 40) galvanized steel pipe in accordance with *ASTM F1083* at least one size larger than line posts.

#### **4.5.2.4 Rails**

1. Top, brace, bottom, and intermediate rails shall be NPS 1.25 (DN 32) Standard Weight (Schedule 40) galvanized steel pipe (OD = 1.66 inches [42.2 mm]) in accordance with *ASTM F1083*.
2. Brace rails shall be provided with galvanized steel truss rods and truss tighteners.
3. Rail sleeves or couplings shall be in accordance with *ASTM F626*.

#### **4.5.2.5 Tension Wire**

Tension wire shall be 7-gage (0.177 inch [4.50 mm] in diameter) steel wire, Type II (galvanized), Class 5 coating, in accordance with *ASTM A824*.

#### **4.5.2.6 Fittings**

All chain link fence fittings shall be in accordance with *ASTM F626*.

#### **4.5.2.7 Barbed Wire**

1. Barbed wire shall consist of double 12.5-gage (0.099 inches [2.51 mm] in diameter) twisted steel wire with 14-gage (0.080 inches [2.03 mm] in diameter), 4-point round steel barbs spaced on 5-inch (127-mm) centers, Coating Type Z, Coating Class 3, in accordance with *ASTM A121*.
2. Top 1 foot (300 mm) of fence shall consist of three strands of barbed wire attached to Type I, pressed steel, galvanized barbed wire arms in accordance with *ASTM F626*.

#### **4.5.2.8 Barbed Tape**

When specified in contract documents, barbed tape materials shall be in accordance with *ASTM F1910*.

### **4.5.3 Polymer-Coated Chain Link Steel Fence**

If polymer-coated fence is specified in contract documents, materials shall be in accordance with Section 4.5.2 and with the following requirements:

#### **4.5.3.1 Fabric**

1. Polymer-coated fabric shall be in accordance with *ASTM F668*.

2. Color shall be in accordance with *ASTM F934* (i.e., brown, green, or black) and as specified in contract documents.

#### **4.5.3.2 Polymer-Coated Framework**

Polymer-coated framework shall have a (PVC, Polyolefin, Polyester) coating fused and adhered to the exterior zinc coating of the post or rail. PVC and polyolefin minimum thickness shall be 10 mils (0.254 mm) and polyester coating minimum thickness shall be 3 mils (0.076 mm) in accordance with *ASTM F1043*. Color shall match fabric.

#### **4.5.3.3 Tension Wire**

Polymer-coated tension wire shall be 7-gage (0.177 inch [4.50 mm] in diameter) steel wire in accordance with *ASTM F1664*. Polymer coating, class, and color shall match fabric.

#### **4.5.3.4 Fittings**

Polymer-coated fittings shall be in accordance with *ASTM F626*. Minimum thickness of polymer coating shall be 0.006 inches (0.152 mm) fused and adhered to zinc coated fittings. Maximum thickness of polymer coating shall be 0.015 inches (0.381 mm). Color shall match fabric.

#### **4.5.3.5 Barbed Wire**

Polymer-coated barbed wire shall consist of double 12.5-gage (0.099 inches [2.51 mm] in diameter) twisted steel wire with 14-gage (0.080 inches [2.03 mm] in diameter), 4-point round steel barbs spaced on 5-inch (127-mm) centers, Coating Type Z, Coating Class 3, in accordance with *ASTM F1665*.

### **4.5.4 Gates**

- 4.5.4.1 Gate materials such as fabric, bolts, nuts, tension bars, barbed wire, brace rail, truss rods, and tighteners shall be the same as fence materials and coating.
- 4.5.4.2 Gates shall be manually or electrically operated as specified in contract documents.
- 4.5.4.3 Swing gates and posts shall be in accordance with *ASTM F900*. Frames shall be NPS 1.5 (DN 40) Standard Weight (Schedule 40) pipe (OD = 1.9 inches [48.3 mm]) welded construction.
- 4.5.4.4 Slide gates shall be in accordance with *ASTM F1184*.
- 4.5.4.5 Automated vehicular gates shall be in accordance with *ASTM F2200*.

### **4.5.5 Concrete**

- 4.5.5.1 Concrete shall have a minimum 28-day compressive strength of 2500 psi (17 MPa).
- 4.5.5.2 Concrete mix design shall be in accordance with *ASTM C94/C94M*.

## 4.6 Execution

### 4.6.1 Preparation

4.6.1.1 Clearing and grubbing shall be performed to a width necessary to permit a proper fence installation.

4.6.1.2 A smooth profile at the fence line shall be provided so that the bottom of fence will not be greater than 2 inches (50 mm) above finished ground line.

### 4.6.2 Installation

Fencing and gate installation shall be in accordance with *ASTM F567* except as otherwise specified below.

#### 4.6.2.1 Post Spacing

Line posts and brace posts shall be set at intervals not exceeding 10 feet (3 m).

#### 4.6.2.2 Foundation Sizes

Unless otherwise specified in contract documents, line, corner, pull, terminal, and gate posts shall be set vertically in cylindrical concrete foundations in accordance with Table 1.

**Table 1 - Line, Corner, Pull, Terminal, and Gate Post Installation Schedule**

Post Size (OD)	Foundation Diameter	Foundation Depth	Post Embedment
2.375 in. (60.3 mm )	0' - 10" (250 mm)	3' - 3" (1 m)	3' - 0" (0.9 m)
2.875 in. (73.0 mm)	1' - 0" (300 mm)	3' - 3" (1 m)	3' - 0" (0.9 m)
4.0 in. (101.6 mm)	1' - 0" (300 mm)	3' - 3" (1 m)	3' - 0" (0.9 m)
6.625 in. (168.3 mm)	1' - 8" (500 mm)	4' - 0" (1.2 m)	3' - 6" (1.1 m)
8.625 in. (219.1 mm)	2' - 2" (650 mm)	4' - 6" (1.4 m)	4' - 0" (1.2 m)

#### 4.6.2.3 Post Hole Preparation

1. Post holes shall be drilled or hand-augured.
2. Soil from excavations shall be spread uniformly adjacent to fence line or as directed by purchaser.

#### 4.6.2.4 Post Setting

1. Loose and foreign materials shall be removed from sides and bottoms of holes.
2. If posts are placed in sleeved holes, nonshrink Portland cement grout, approved by purchaser, shall be used to grout in posts.
3. Soil shall be moistened before placing concrete.
4. Concrete shall be placed continuously into hole around posts and tamped to consolidate.

5. Post shall be checked for vertical plumbness and horizontal alignment.
6. Exposed surface of concrete foundation shall be set 2 inches (50 mm) above surrounding grade.

#### **4.6.2.5 Rails, Tension Wire, and Bracing**

1. Unless otherwise specified in contract documents, fence shall be installed with a top rail and bottom tension wire.
2. Rails and tension wire shall be installed before installing chain link fabric.
3. Tension wire shall be stretched taut between posts independently and prior to installation of fabric. Tension wire shall be secured to terminal post using a brace band. Top tension wire shall be installed through the barb arm loop for fences having barbed wire and no top rail.
4. Rail sleeves or couplings shall be installed to allow for expansion and contraction.
5. Brace bands shall be used for attaching top rail or tension wire and braces to brace terminal and gateposts.

#### **6. Bracing**

- a. Corner, pull, terminal, and gate posts shall be braced and trussed.
- b. Two brace assemblies shall be used for each corner or pull post.
- c. One brace assembly shall be used for each terminal or gate post.
- d. Brace assemblies shall be installed in accordance with *ASTM F567*.

#### **4.6.2.6 Fabric**

1. Chain link fence fabric shall be installed on the outside of the secured area in accordance with *ASTM F567*.
2. Fabric shall be installed not more than 2 inches (50 mm) above the ground, and fastened securely to posts, rails, and tension wires in accordance with *ASTM F567*.
3. Fabric tie wire shall be spaced at 2-feet (600-mm) intervals on centers for rails and line posts.
4. Chain link fabric shall be secured to tension wire with hog rings 18 inches (450 mm) on center.

#### **4.6.2.7 Barbed Wire**

1. Barbed wire strands shall be spaced uniformly and attached to frame with brace bands.
2. Extension arms on line posts and corner posts shall be inclined at approximately 45 degrees away from property enclosed unless otherwise specified in contract documents.

3. Strands of barbed wire shall be stretched to remove sag and be anchored firmly to extension arms.
4. Each strand of barbed wire shall be attached to terminal post using a brace band.
5. Barbed wire on gates shall be attached to vertical members of gates.

#### **4.6.2.8 Barbed Tape**

Barbed tape shall be installed in accordance with *ASTM F1911*.

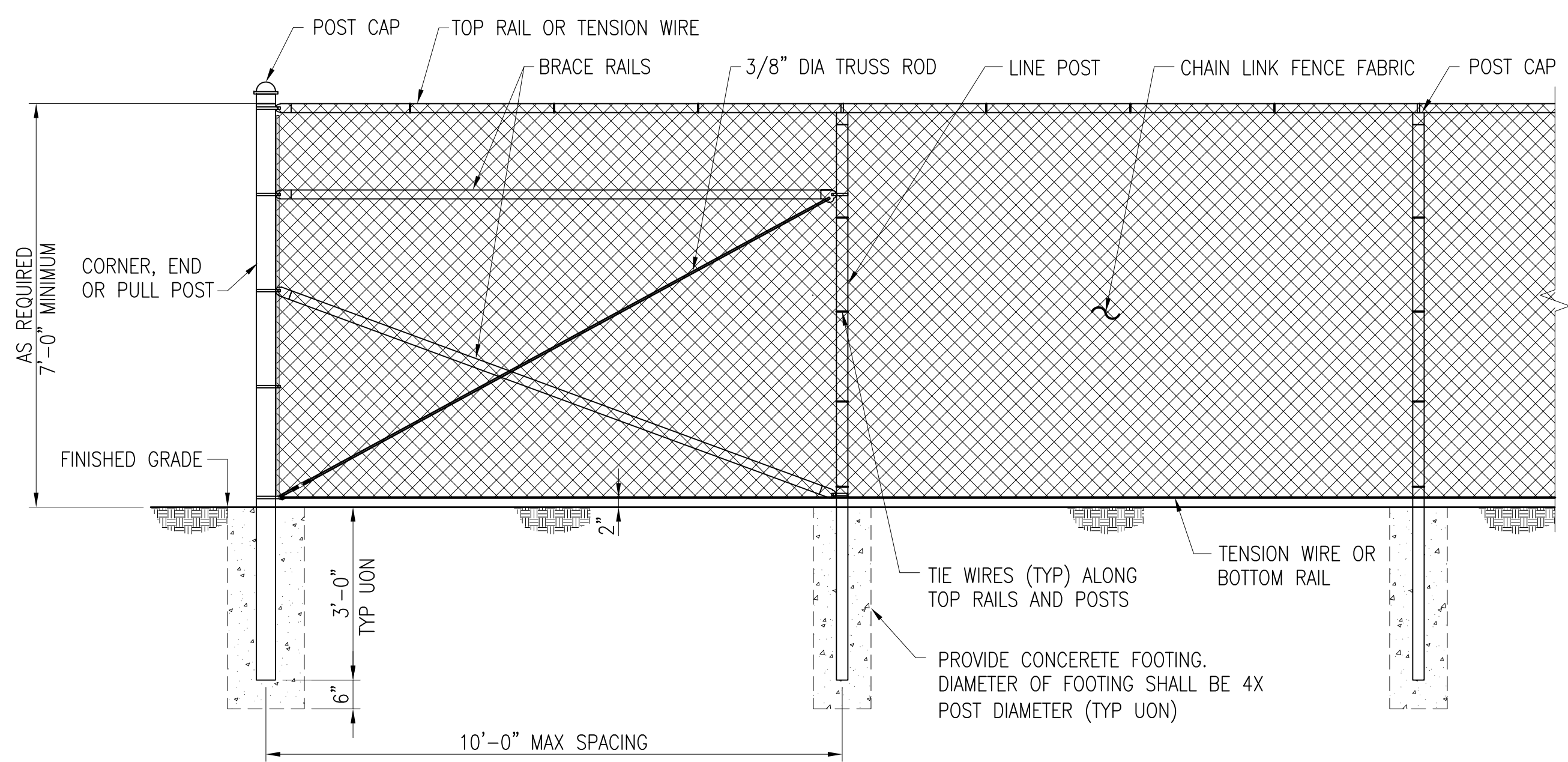
#### **4.6.2.9 Gates**

1. Gates shall be installed in accordance with *ASTM F567*.
2. Gates shall be braced and trussed to prevent sagging, buckling, and warping.

#### **4.6.3 Grounding**

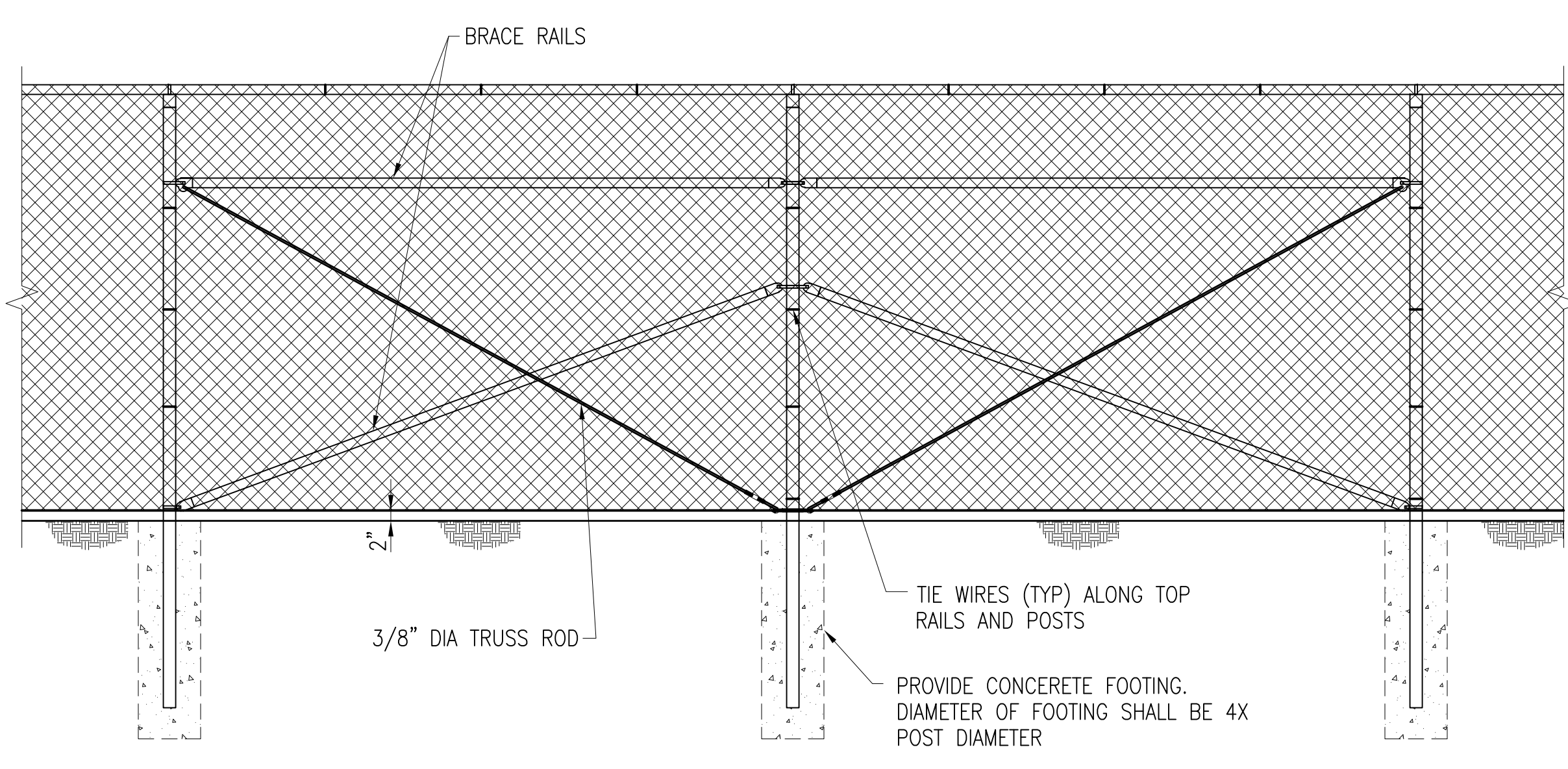
Unless otherwise noted in contract documents, grounding of fence, fence posts, and gates shall be in accordance with *PIP ELIGD000*, and shall be performed by a licensed electrical contractor.

FILE NAME: J:\CIV\FENCE DRAWINGS\55009-UFC-700.dwg LAYOUT NAME: S-700 PLOTTED: Monday, April 29, 2013 - 1:03pm



**TYPICAL FENCE AND CORNER PANEL ELEVATION**

SCALE: 1" = 1'-0"

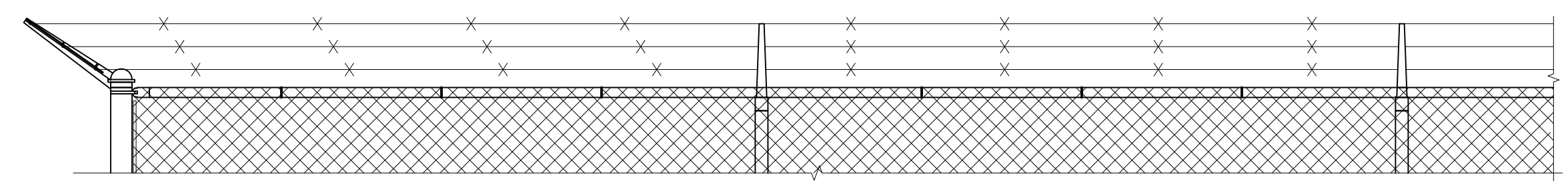


**TYPICAL FENCE AND BRACED PANEL ELEVATION**

SCALE: 1" = 1'-0"

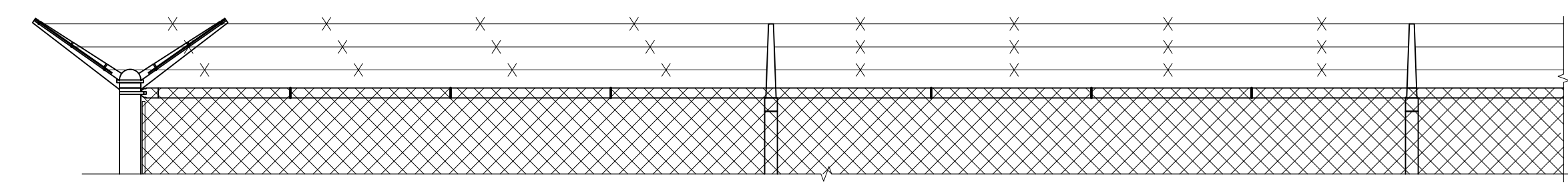
**NOTE (1):** A BOTTOM RAIL CAN BE ADDED FOR SECURITY, IT SHALL BE INSTALLED APPROX 3" ABOVE GRADE (A MINIMUM OF 2" AND A MAXIMUM OF 4"). HARDWARE SHALL BE WELDED OR SHOT NAILED TO POSTS AND RAILS IN ORDER TO SECURE IN PLACE. ATTACH FABRIC TO NEW BOTTOM RAIL TO ELIMINATE POSSIBILITY OF PEELING UP FABRIC.

**NOTE (2):** SOME LOCATIONS MAY REQUIRE 8' OF FABRIC.



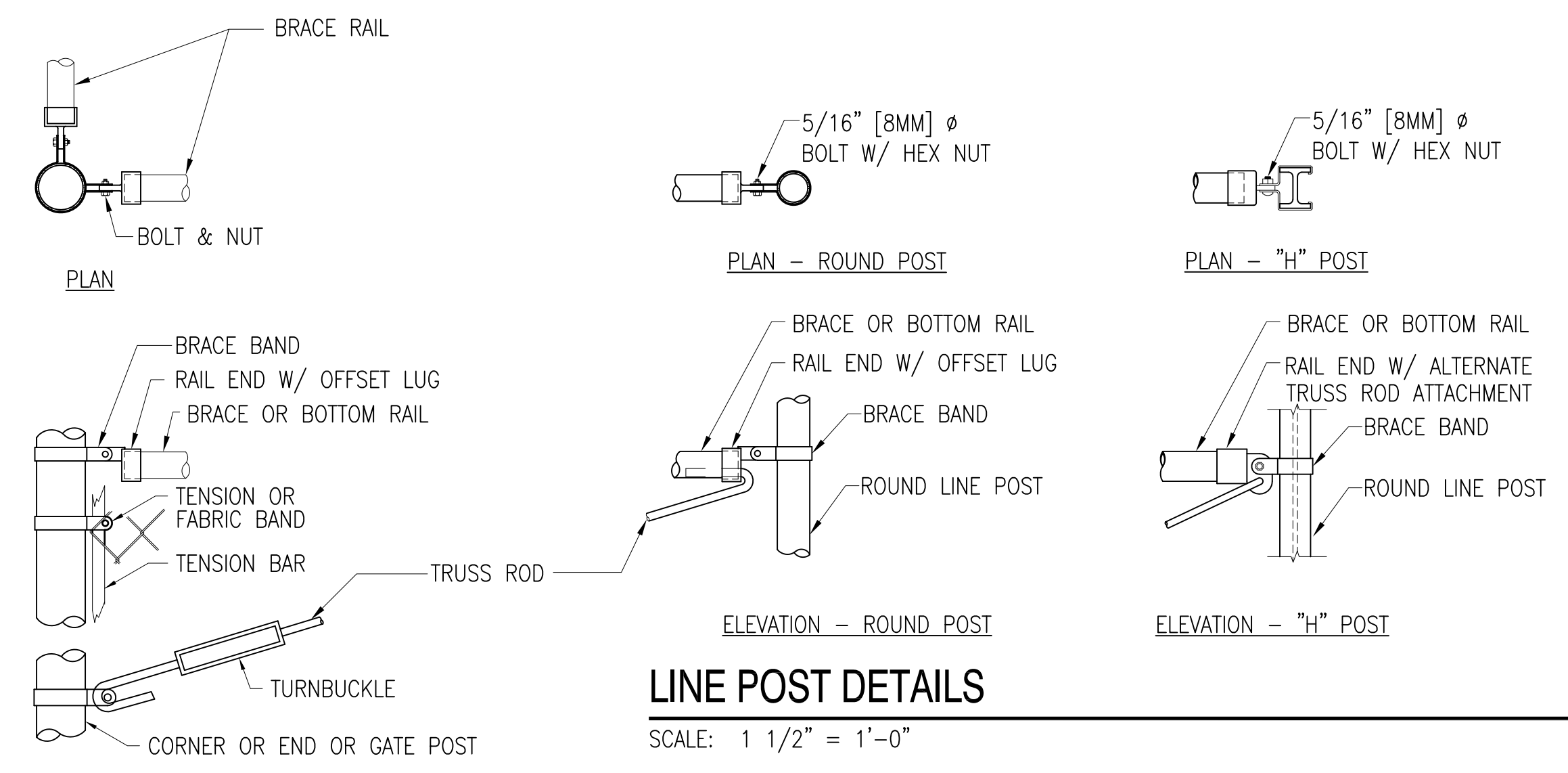
**TYPICAL 3 STRAND BARBED WIRE AND SINGLE EXTENSION ARM CONFIGURATION**

SCALE: 1" = 1'-0"



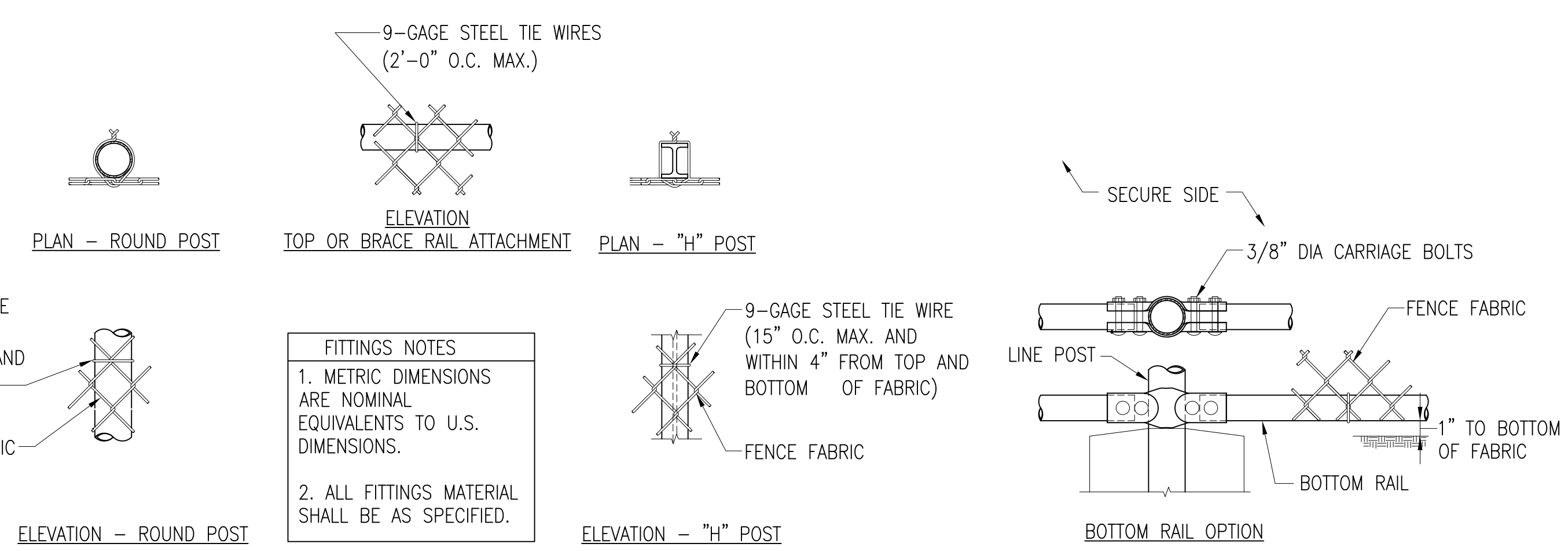
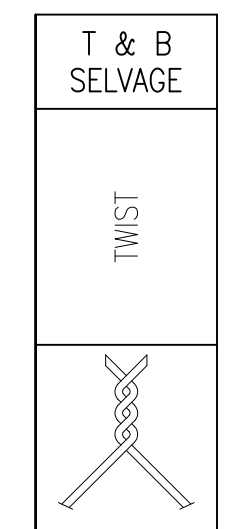
**TYPICAL 6 STRAND BARBED WIRE AND DOUBLE EXTENSION ARM CONFIGURATION**

SCALE: 1" = 1'-0"



**LINE POST DETAILS**

SCALE: 1 1/2" = 1'-0"



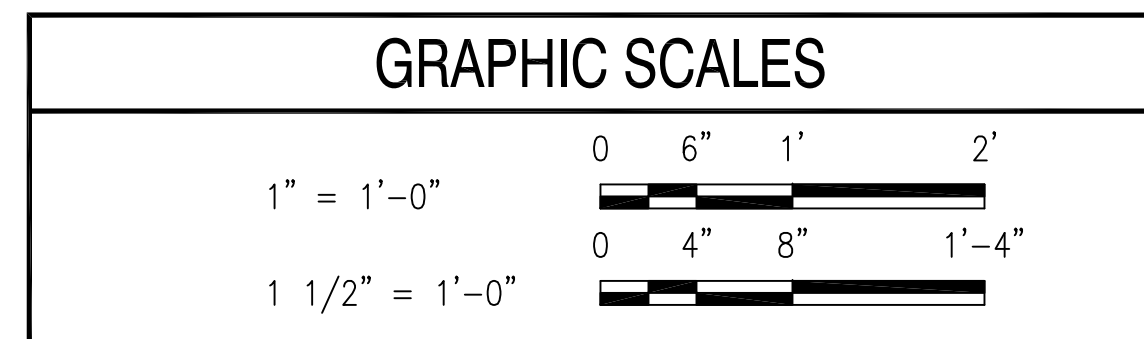
**FITTINGS NOTES**

1. METRIC DIMENSIONS ARE NOMINAL EQUIVALENTS TO U.S. DIMENSIONS.

2. ALL FITTINGS MATERIAL SHALL BE AS SPECIFIED.

**CORNER OR END POSTS**

SCALE: 1 1/2" = 1'-0"



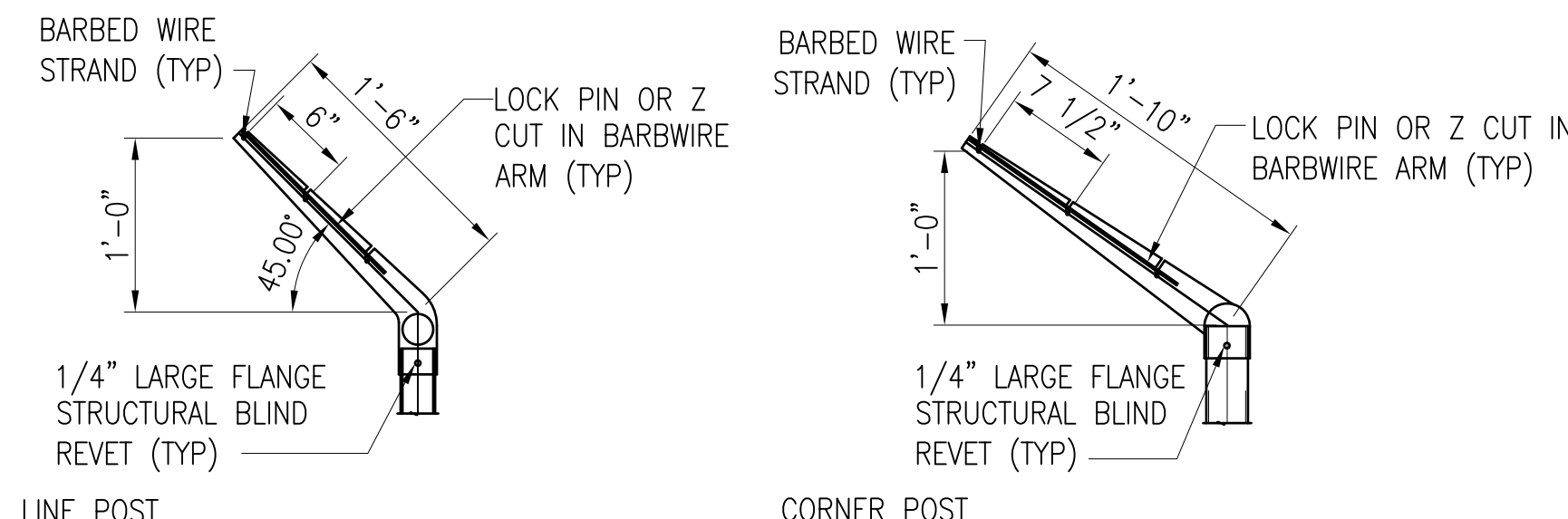
**UNIFIED FACILITIES CRITERIA 4-022-03 SECURITY ENGINEERING: FENCES, GATES AND GUARD FACILITIES**

**DEFINITIVE DRAWINGS FOR SECURITY FENCING, GATES AND CABLING**

**CHAIN LINK FENCE AND DETAILS**

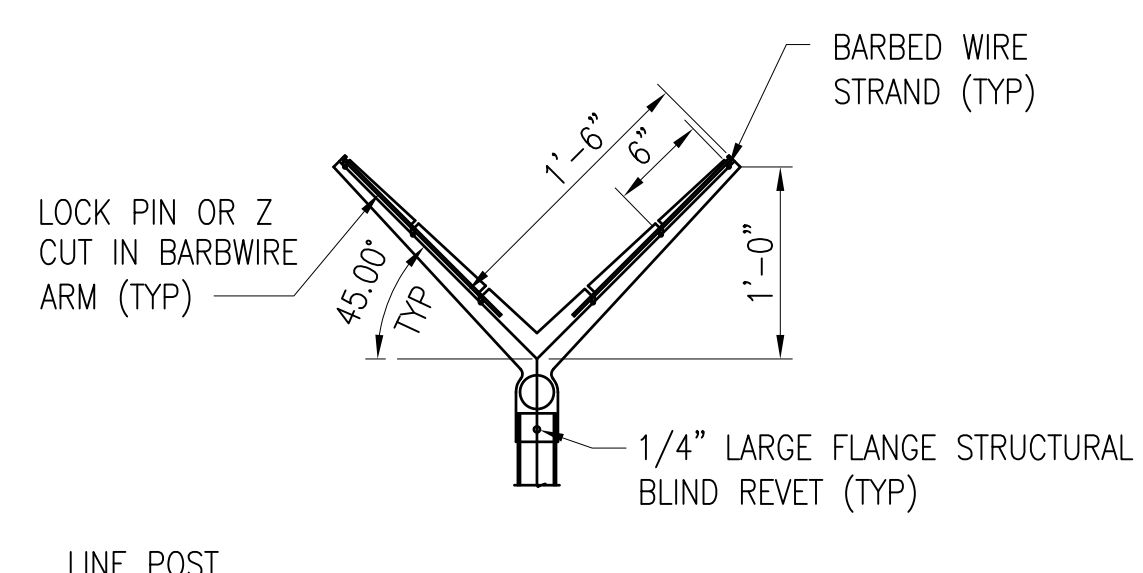
**UFC-700**

DRAWING REVISION: 24 AUGUST 2007



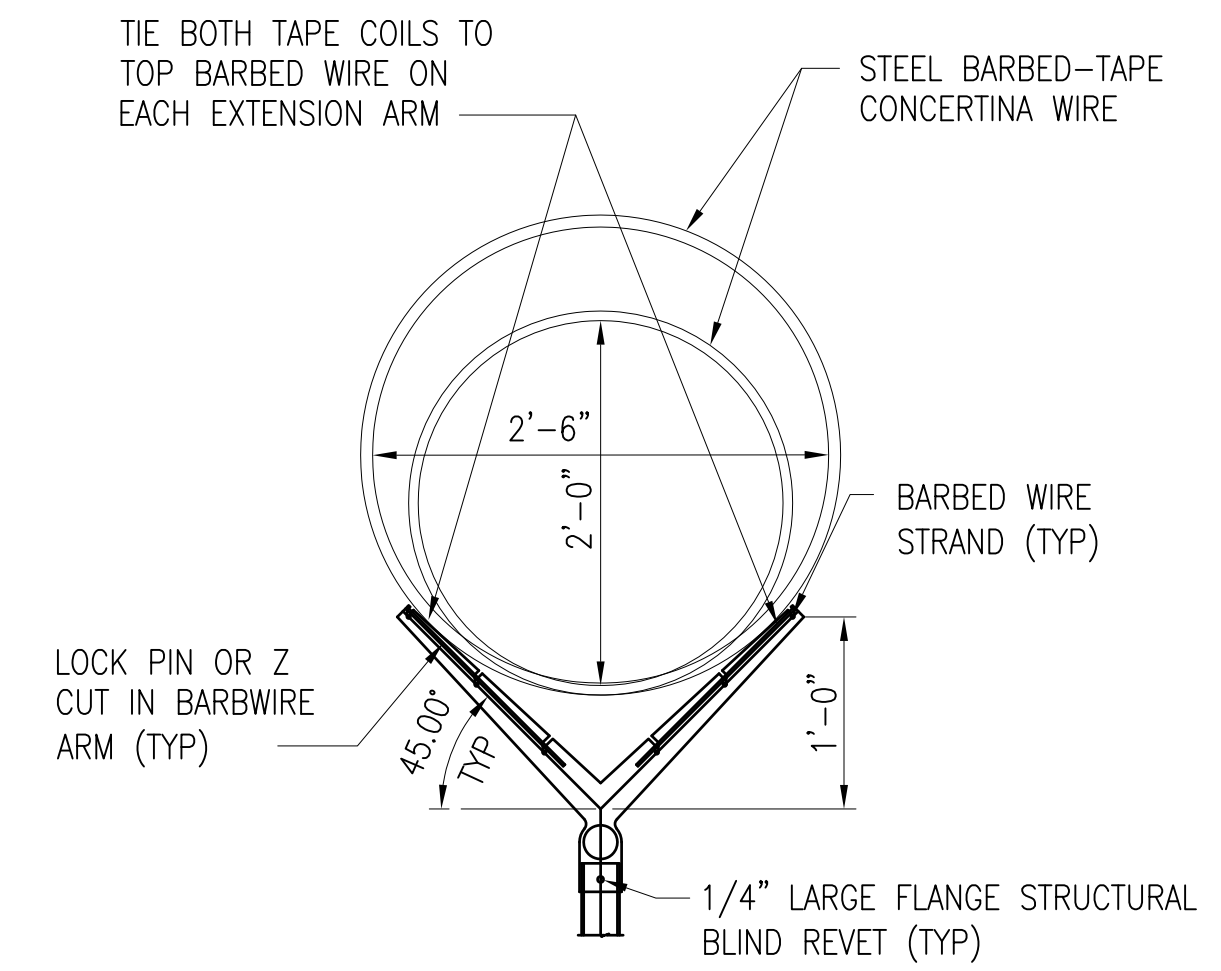
**SINGLE EXTENSION ARM DETAILS**

SCALE: 1" = 1'-0"



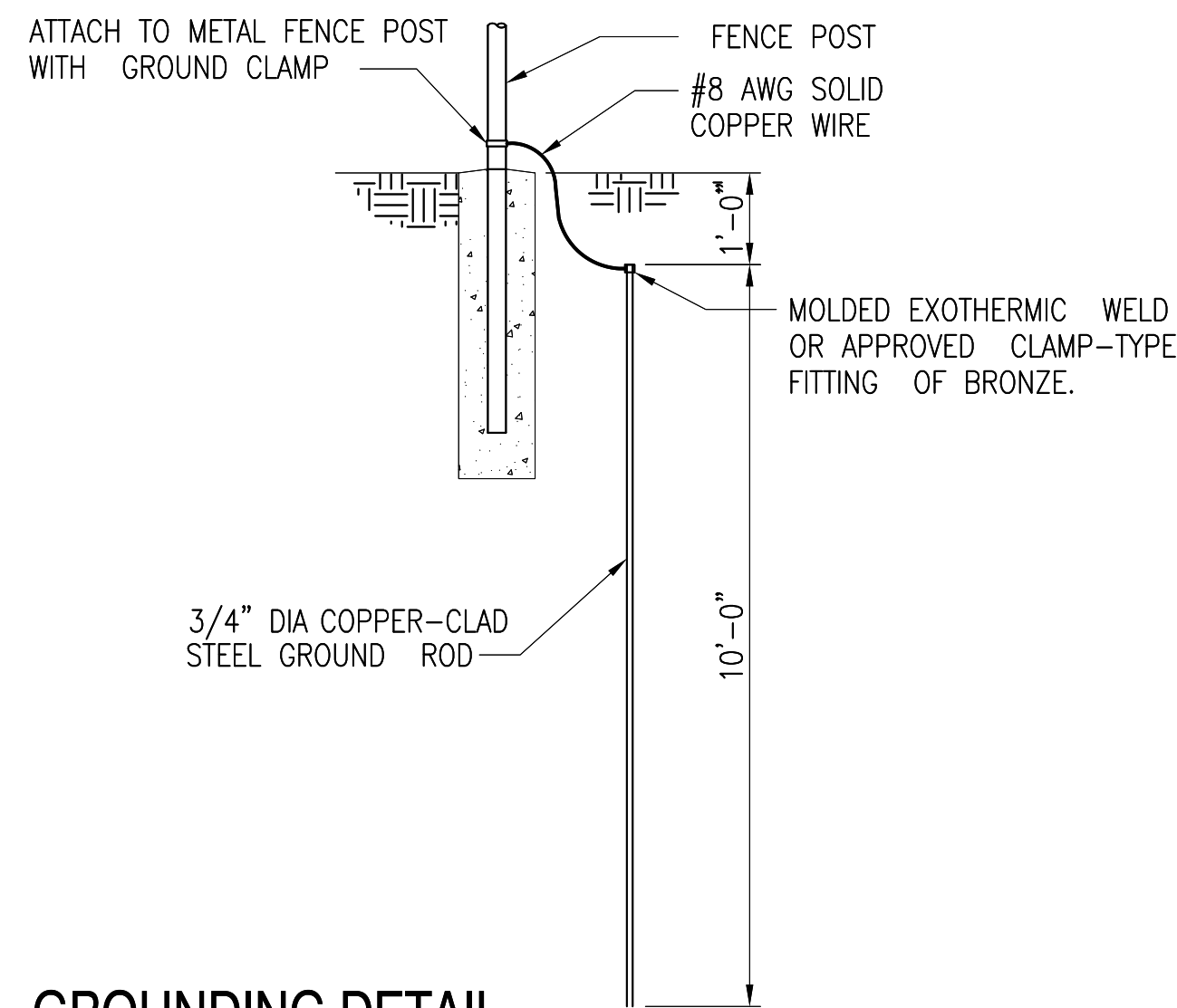
**DOUBLE EXTENSION ARM DETAILS**

SCALE: 1" = 1'-0"



**CONCERTNA WIRE MOUNTING**

SCALE: 1" = 1'-0"



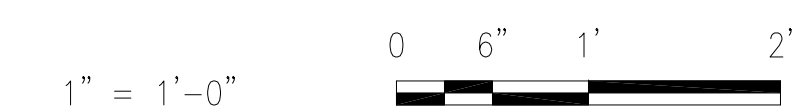
**GROUNDING DETAIL**

NO SCALE

**CHAIN LINK FENCING NOTES**

1. **FABRIC:** THE STANDARD FENCE FABRIC SHALL BE VINYL, ZINC OR ALUMINUM-COATED STEEL WIRE CHAIN LINK WITH MESH OPENINGS NOT LARGER THAN TWO INCHES PER SIDE AND A TWISTED AND BARBED SELVAGE AT TOP AND BOTTOM IN ACCORDANCE WITH THE SPECIFICATIONS. UTILIZE 6-GAUGE FOR BASE PERIMETER OR HEIGHTENED SECURITY ZONES AND 9-GAUGE FOR BASE INTERIOR OR WHEN JOINING AN EXISTING FENCE WHICH IS ALREADY 9-GAUGE.
2. **FABRIC TIES:** ONLY 12-GAUGE STEEL TIES SHALL BE USED. COATING OR PLATING WILL BE ELECTROLYTICALLY COMPATIBLE WITH THE FENCE FABRIC TO INHIBIT CORROSION.
3. **REINFORCEMENT:** TENSION WIRES SHALL BE INSTALLED AND INTERWOVEN (OR AFFIXED WITH FABRIC TIES) ALONG THE TOP & BOTTOM OF THE FENCE FOR STABILIZATION OF THE FENCE FABRIC.
4. **FENCE HEIGHT:** CHAIN LINK FABRIC SHALL BE 7' HIGH WITH AN ADDITIONAL 1' IN HEIGHT COMPOSED OF 3 STRANDS OF BARBED WIRE AS REQUIRED. THE TOTAL FENCE HEIGHT SHALL BE 8'.
5. **GROUND CLEARANCE:** BOTTOM OF THE FENCE FABRIC SHALL BE WITHIN TWO INCHES OF FIRM SOIL.
6. **TOP GUARDS:** A TOP GUARD IS AN OVERHANG OF BARBED WIRED ALONG THE TOP OF A FENCE, FACING OUTWARD (AWAY FROM PROTECTED SITE) AND UPWARD AT APPROX. 45° ANGLE. TOP GUARD SUPPORTING ARMS WILL BE PERMANENTLY AFFIXED TO THE TOP OF FENCE POSTS TO INCREASE THE OVERALL HEIGHT OF THE FENCE AT LEAST 1 FOOT. THREE STRANDS OF 12-GAUGE BARBED WIRE, EQUALLY SPACED, SHALL BE INSTALLED ON THE SUPPORTING ARMS.
7. **FENCE POSTS:** SHALL BE ASTM F1043 OR F1083 ROUND PIPE OR SQUARE TUBE AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS. FENCE POST SPACING AND SIZE (DIAMETER) SHALL BE DETERMINED IN ACCORDANCE WITH CHAIN LINK FENCE MANUFACTURERS' INSTITUTE (WLG 2445). SPACING SHALL NOT EXCEED 10'-0" OC. SIZE (DIAMETER) SHALL NOT BE LESS THAN THAT SPECIFIED.

**GRAPHIC SCALES**



UNIFIED FACILITIES CRITERIA 4-022-03 SECURITY ENGINEERING: FENCES, GATES AND GUARD FACILITIES  
DEFINITIVE DRAWINGS FOR SECURITY FENCING, GATES AND CABLING

BARBED WIRE ARRANGEMENT DETAILS

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