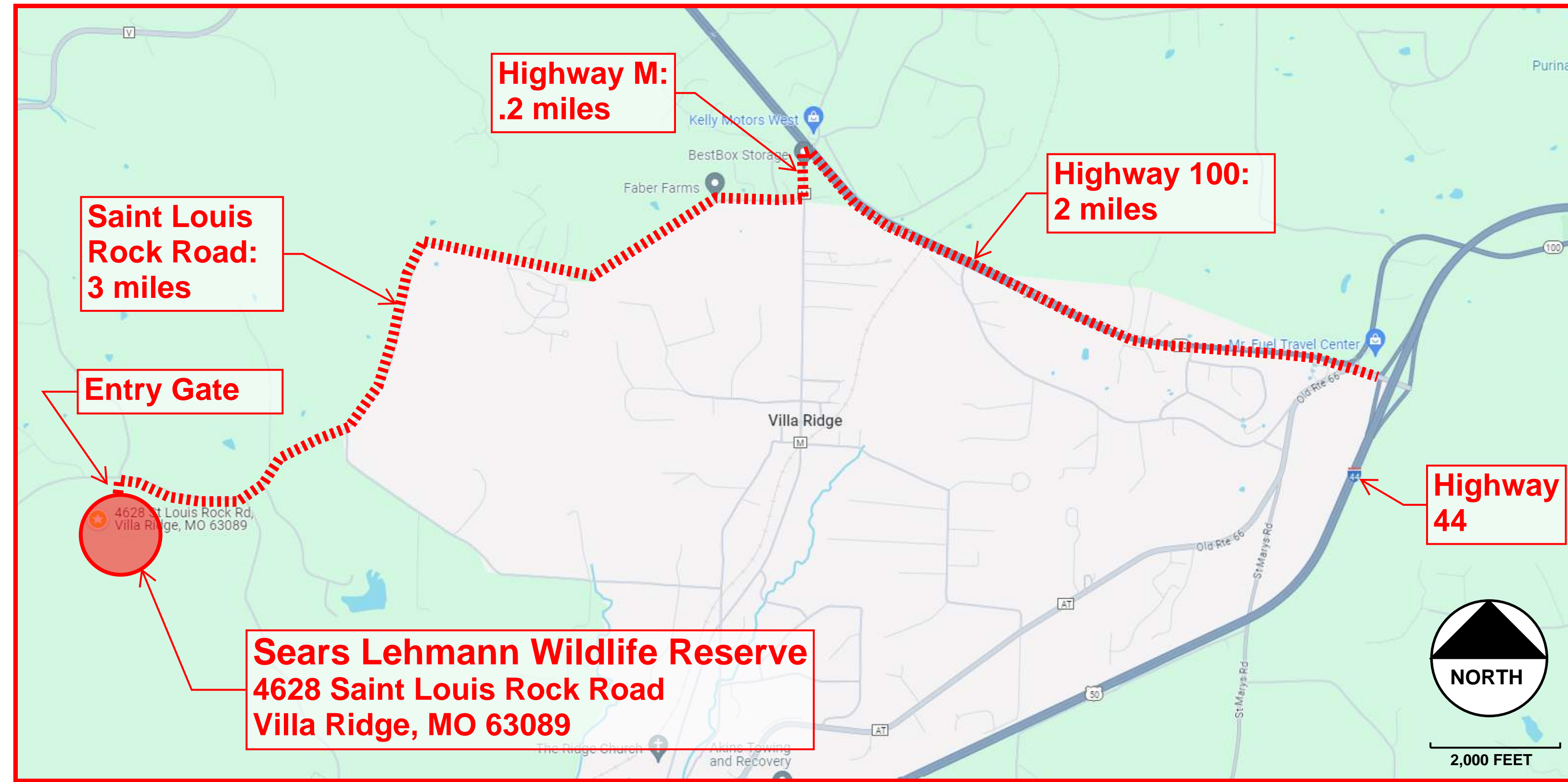


# Habitat Fence Revisions

## Saint Louis Zoo

### Sears Lehmann Jr. Wildlife Reserve

4628 Saint Louis Rock Road, Villa Ridge, MO 63089



## Location Map

No Scale

## Index of Sheets

- A-1 Map, Site Plan and General Notes
- A-2 Tunnel Plan and Section
- A-3 Tunnel Elevation and Section
- A-4 Fence Overhang/ Dig Barrier Plan and Elevations
- A-5 Photos and Specifications

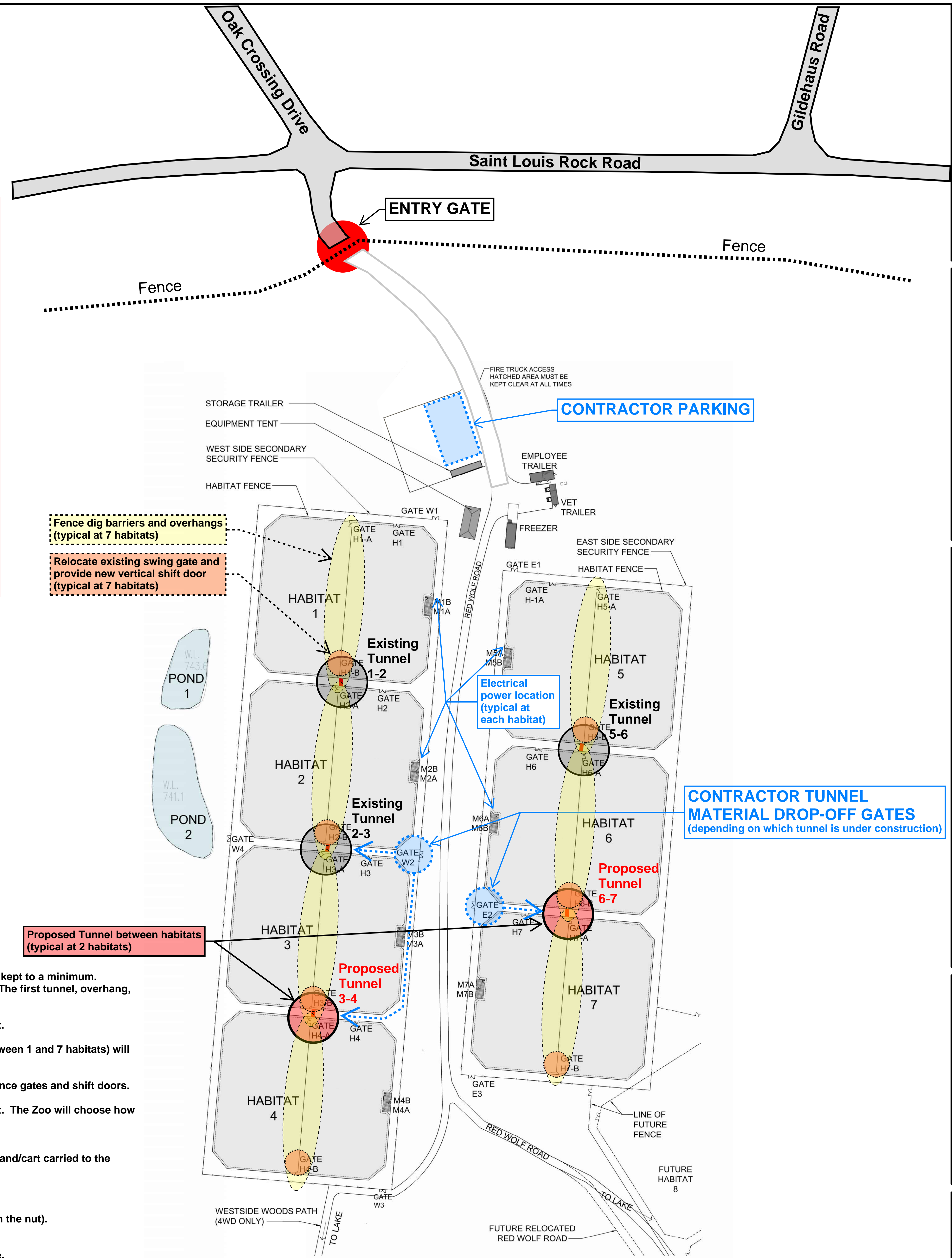


## Area Map

No Scale

## General Notes

1. This is a secure wolf breeding facility - Saint Louis Zoo will meet all contractor personnel at the front gate and escort them to the work area. Noise should be kept to a minimum.
2. The tunnels, overhangs, dig barriers and shift doors are to be constructed one at a time or per habitat (not all habitats can be constructed at the same time). The first tunnel, overhang, dig barrier and shift door must be completed before work on the next habitat is started.
3. Cost Line items:
  - A. **Tunnel Construction.** The Zoo will choose how many habitats will have tunnels constructed (a range between 1 and 2 tunnels) based on available budget.
    - a.) Line item A.1: Cost per tunnel.
  - B. **Fence dig barriers and overhangs.** Please list in your proposal these line items for a single habitat. The Zoo will choose how many habitats (a range between 1 and 7 habitats) will be constructed based on available budget.
    - a.) Line item B.1: Double angled topper entire length of the existing divider fence and triangular toppers at each of the two ends.
    - b.) Line item B.2: Fence mesh dig barriers along both sides of the existing divider fence and also concrete dig barriers below relocated/existing divider fence gates and shift doors.
    - c.) Line item B.3: Top of the fence corner angled barriers.
  - C. **Relocate existing small gate in divider fence and provide new vertical shift door.** Please list in your proposal these options separately for a single habitat. The Zoo will choose how many habitats (a range between 1 and 7 habitats) will have this constructed based on available budget.
    - a.) Line item C.1: Cost to relocate single swing gate per habitat.
    - b.) Line item C.2: Cost to add shift door per habitat.
4. Contractor parking is at the parking area near the entry gate. Unloading of materials for tunnel construction will be at Gate W2 or E2 - materials will then be hand/cart carried to the tunnel location. Trucks may be parked at the material drop-off gate for unloading only and then returned to contractor parking.
5. Contractor to provide a temporary portable restroom and wash sink.
6. All materials should be received prior to starting work on-site to minimize delays. Prefabrication of tunnel components off-site is preferred.
7. Electrical power will be available at the management areas as noted on the site plan - provide extension cords as required. Gas generators are not allowed.
8. Any sharp edges towards the animal habitat must be ground smooth (for example, threaded bolts facing the animal enclosure to be cut flush and smooth with the nut).
9. Viewing of the existing tunnels for reference/measuring after award of contract may be arranged with the keepers.
10. Galvanize materials before assembly. Any galvanizing that is scratched or rusted shall be cleaned and an exact color match cold galvanizing finish applied.
11. Excess soil removed for the new dig barriers will need to be moved outside the habitats towards the contractor's parking to a location the keepers designate.
12. Equipment must fit a 10' wide sloping aisle then turn 90 degrees into an 8' wide double gate (for example, getting equipment into gate H3 on the site plan).
13. Any trees or vegetation to be removed will be by Owner prior to the start of construction.



**Site Plan**  
Scale: 1" = 60'

Saint Louis Zoo  
Animals Always®

Habitat Fence Revisions  
Saint Louis Zoo  
Sears Lehmann Jr. Wildlife Reserve  
4628 Saint Louis Rock Road, Villa Ridge, MO 63089

Rev. #	Revision Date

Map, Site Plan and General Notes

Project #:  
Date: 4/4/2024

SHEET #  
**A-1**



Photo #1

Photo #2

Photo #3

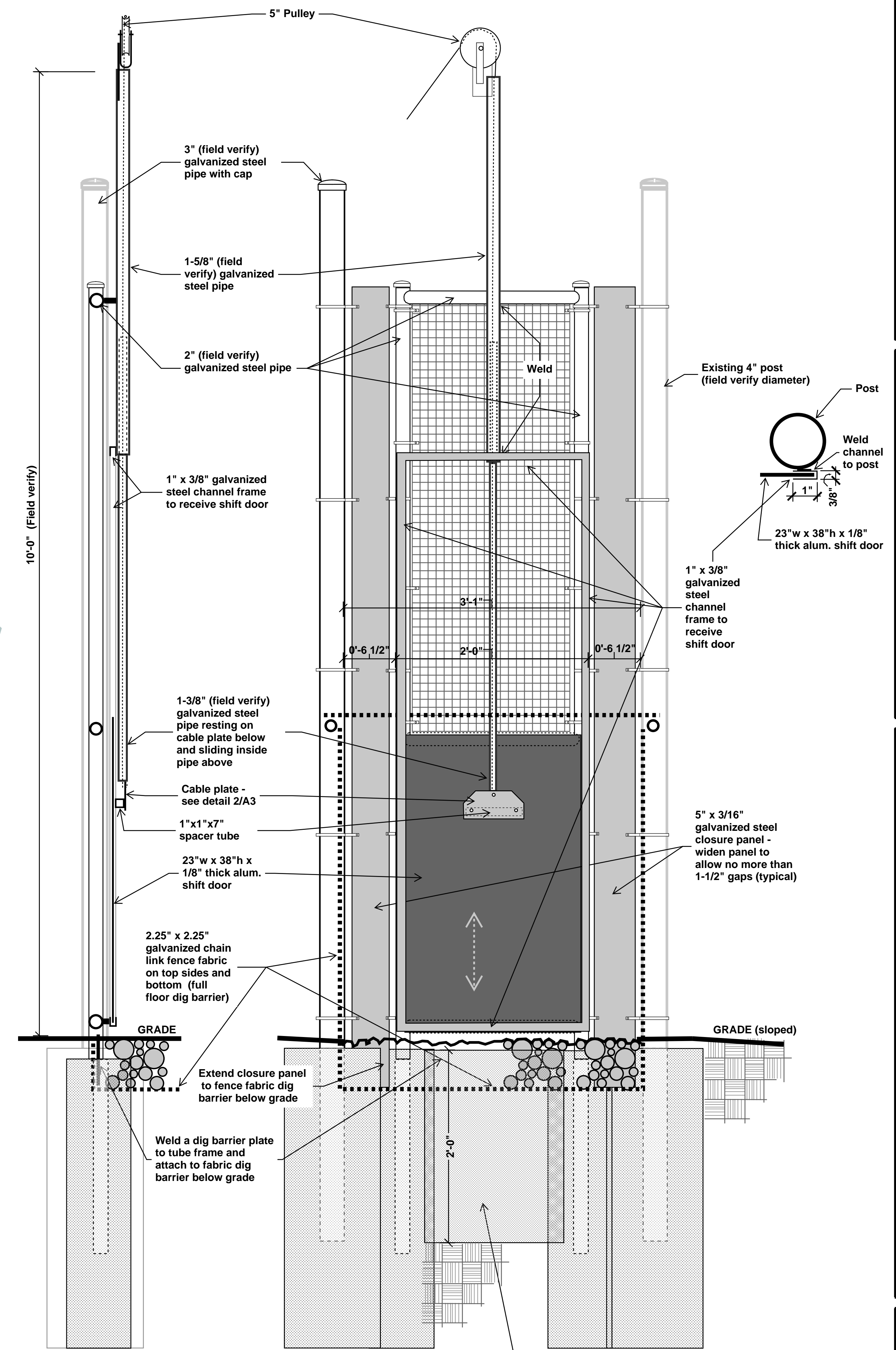
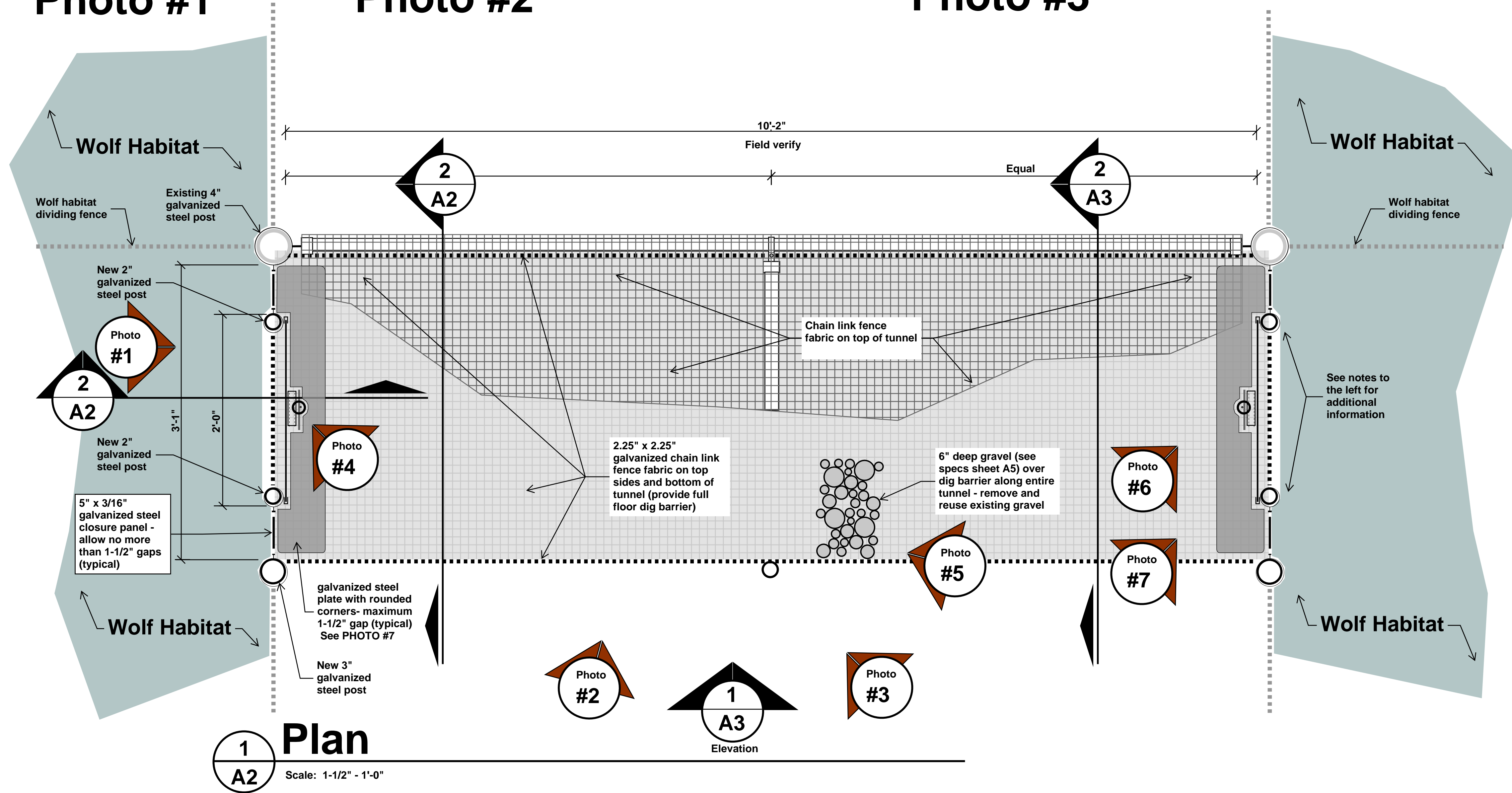


Photo #4



Photo #5



Photo #6

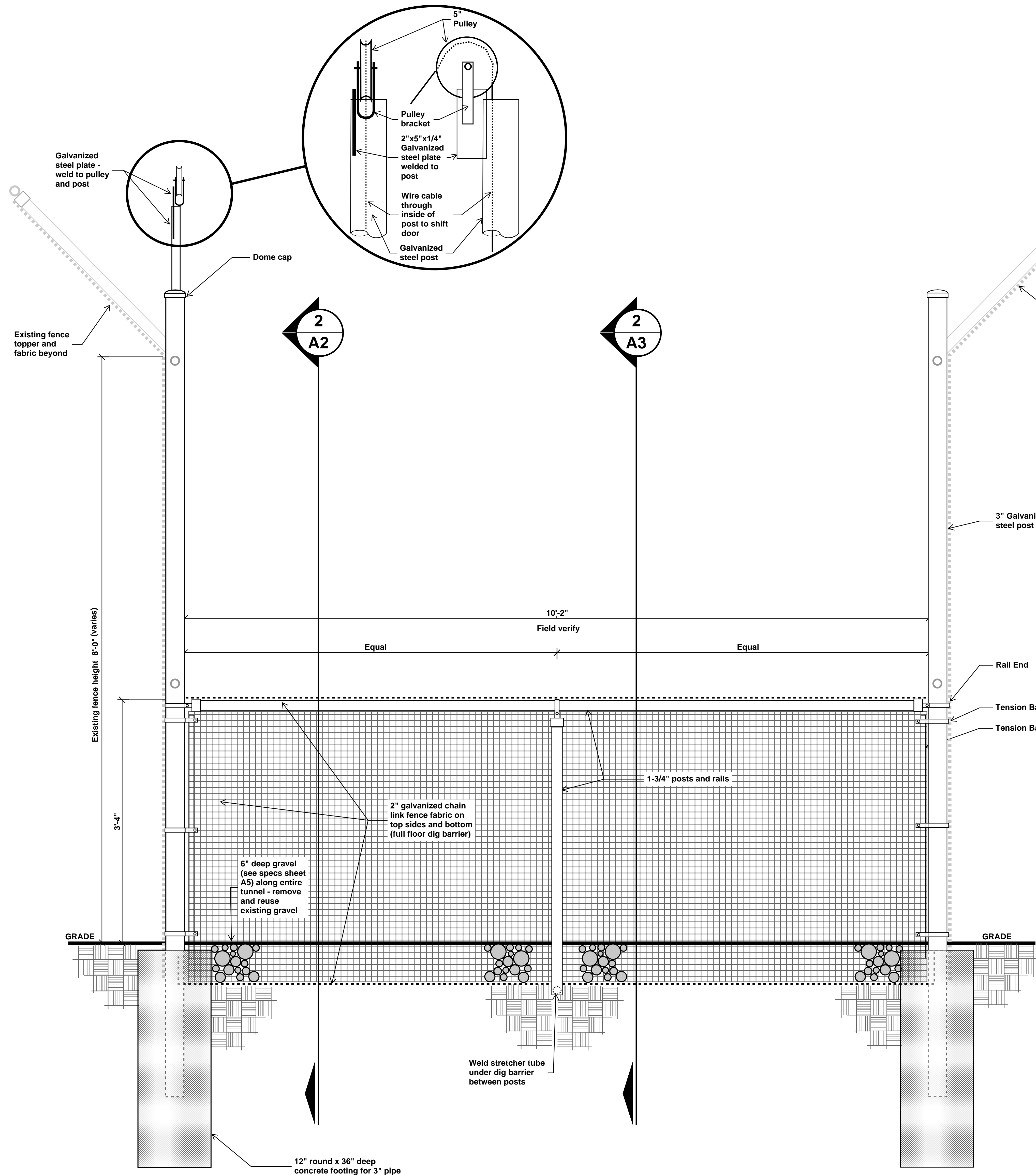


Photo #7

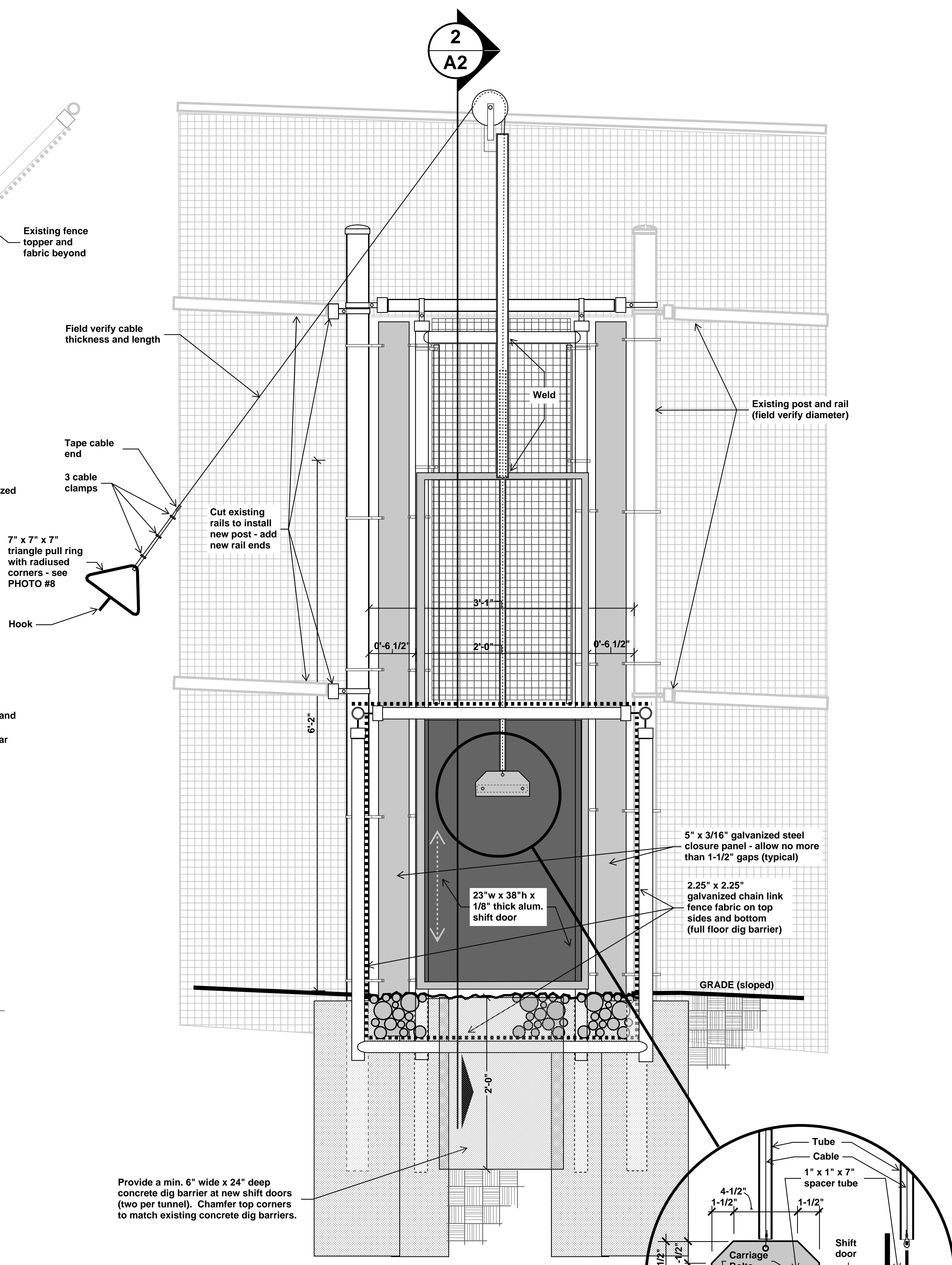


Photo #8

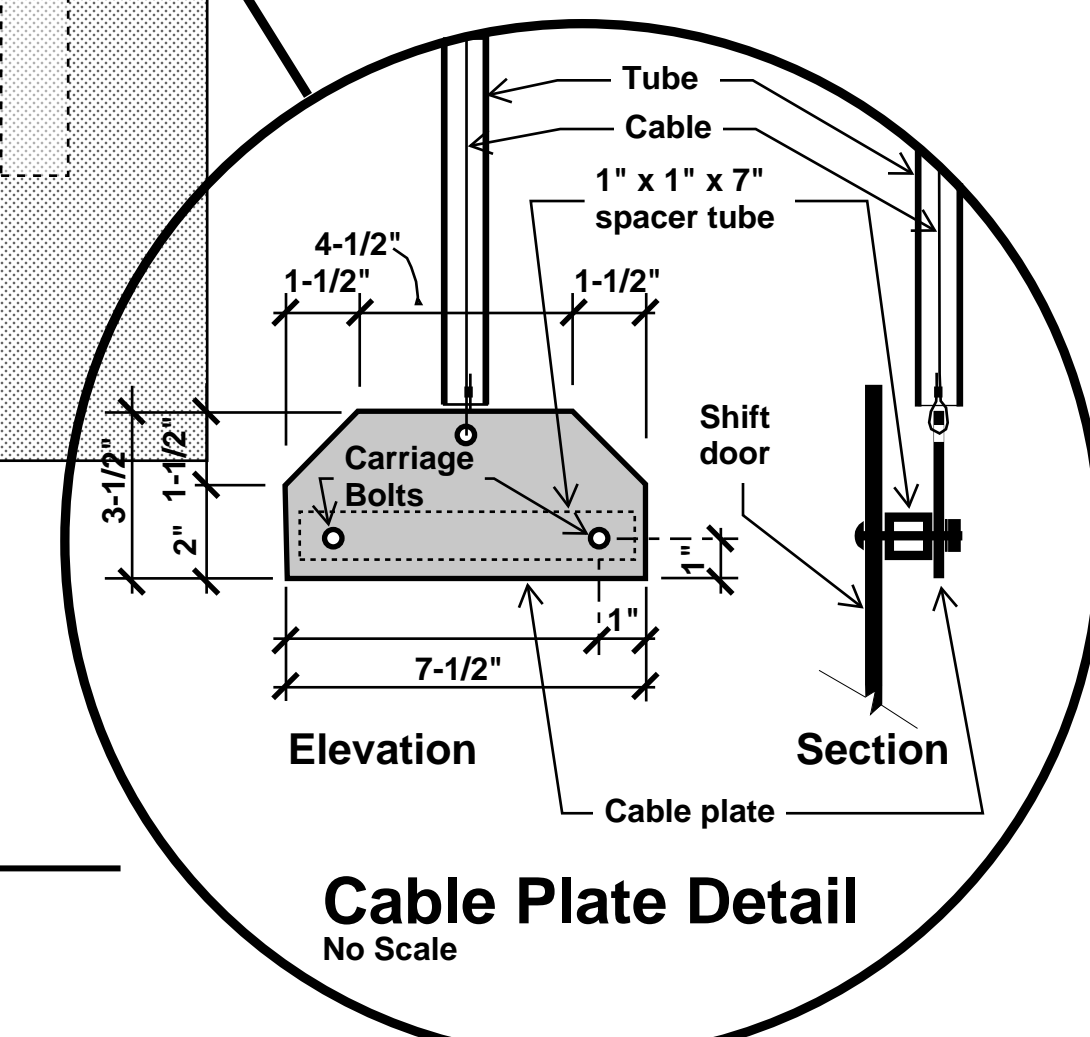
Rev. #	Revision Date



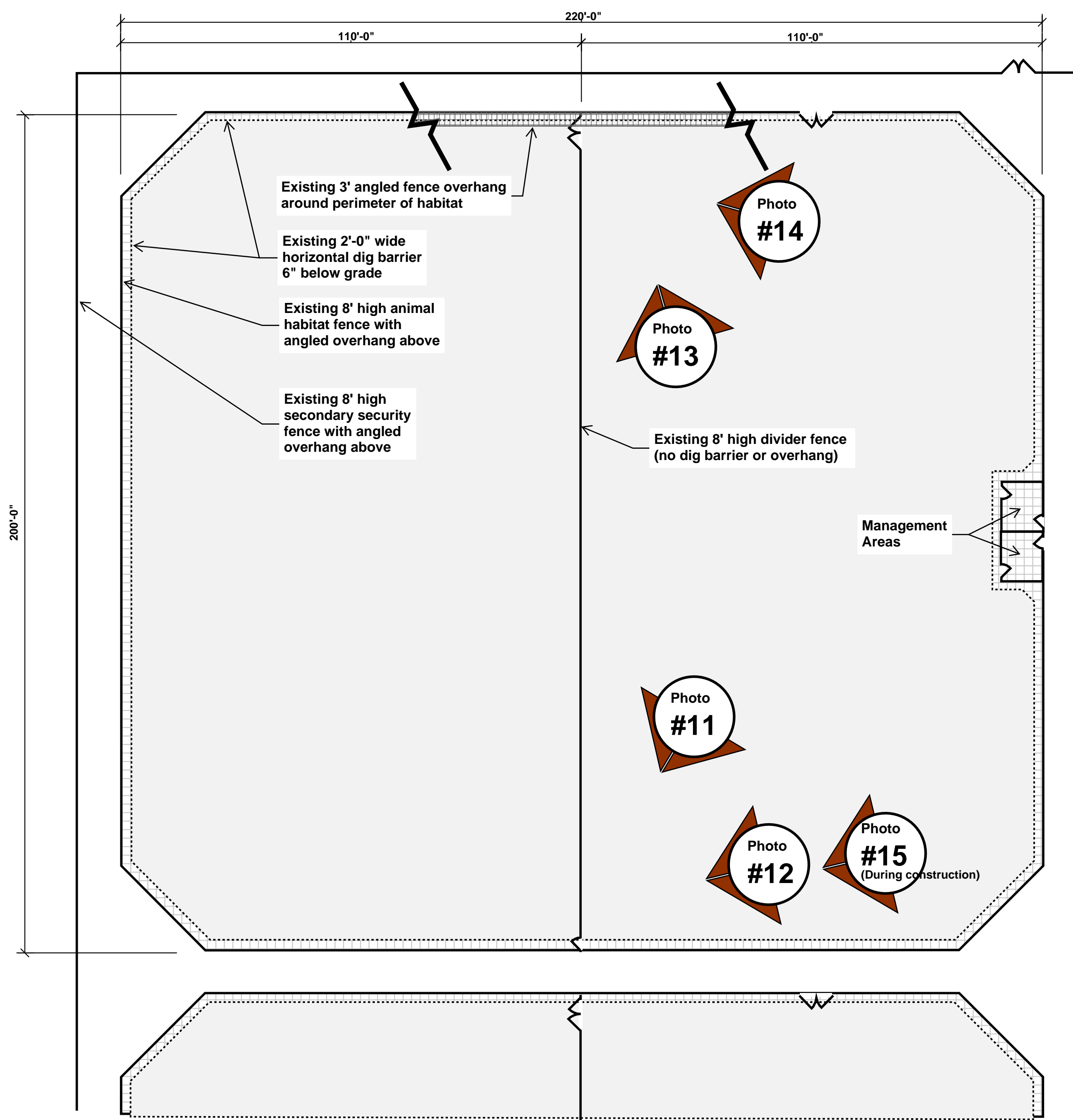
**1 Elevation**  
 Scale: 1-1/2" = 1'-0"



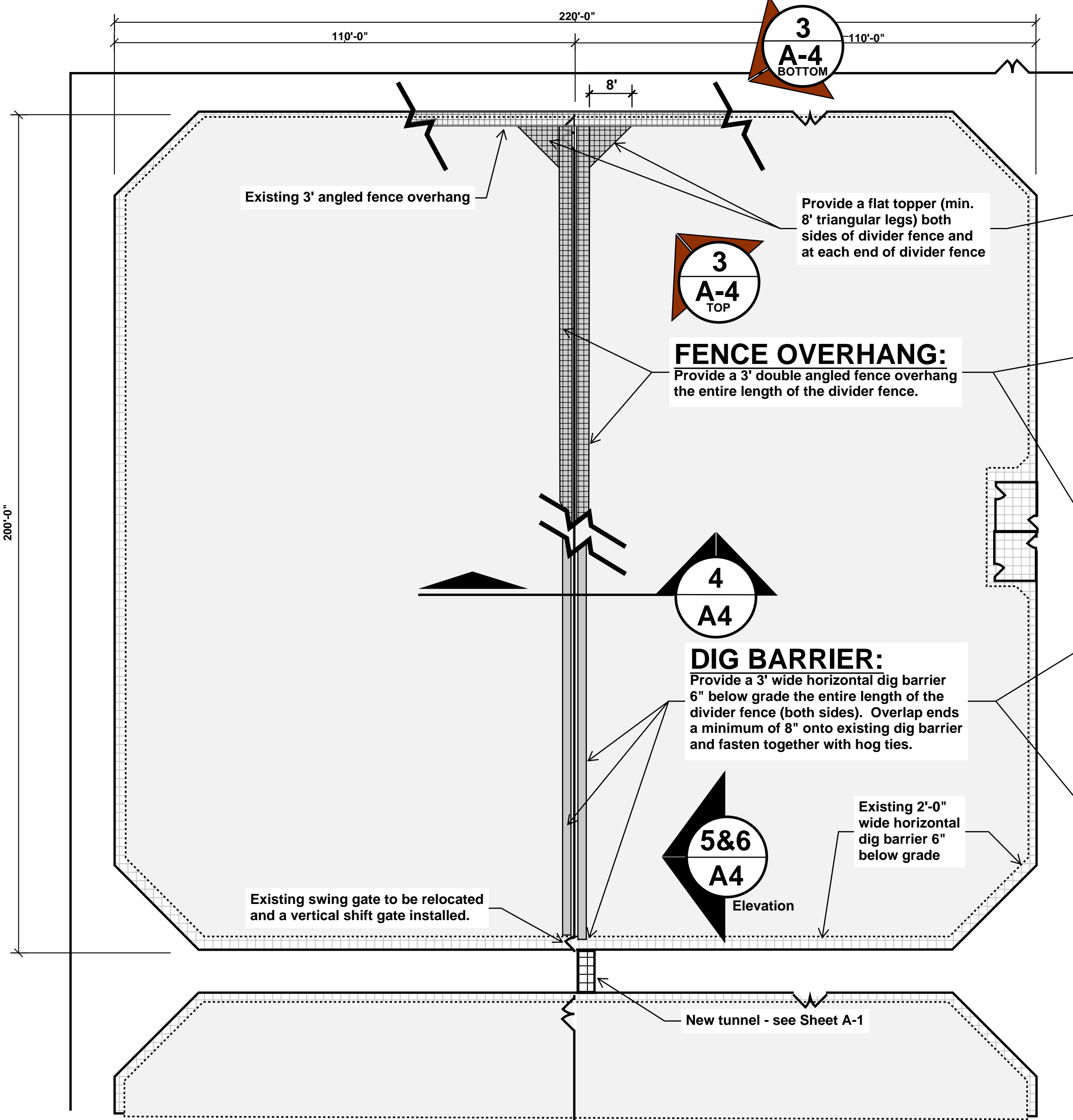
**2 Section**  
 Scale: 1-1/2" = 1'-0"



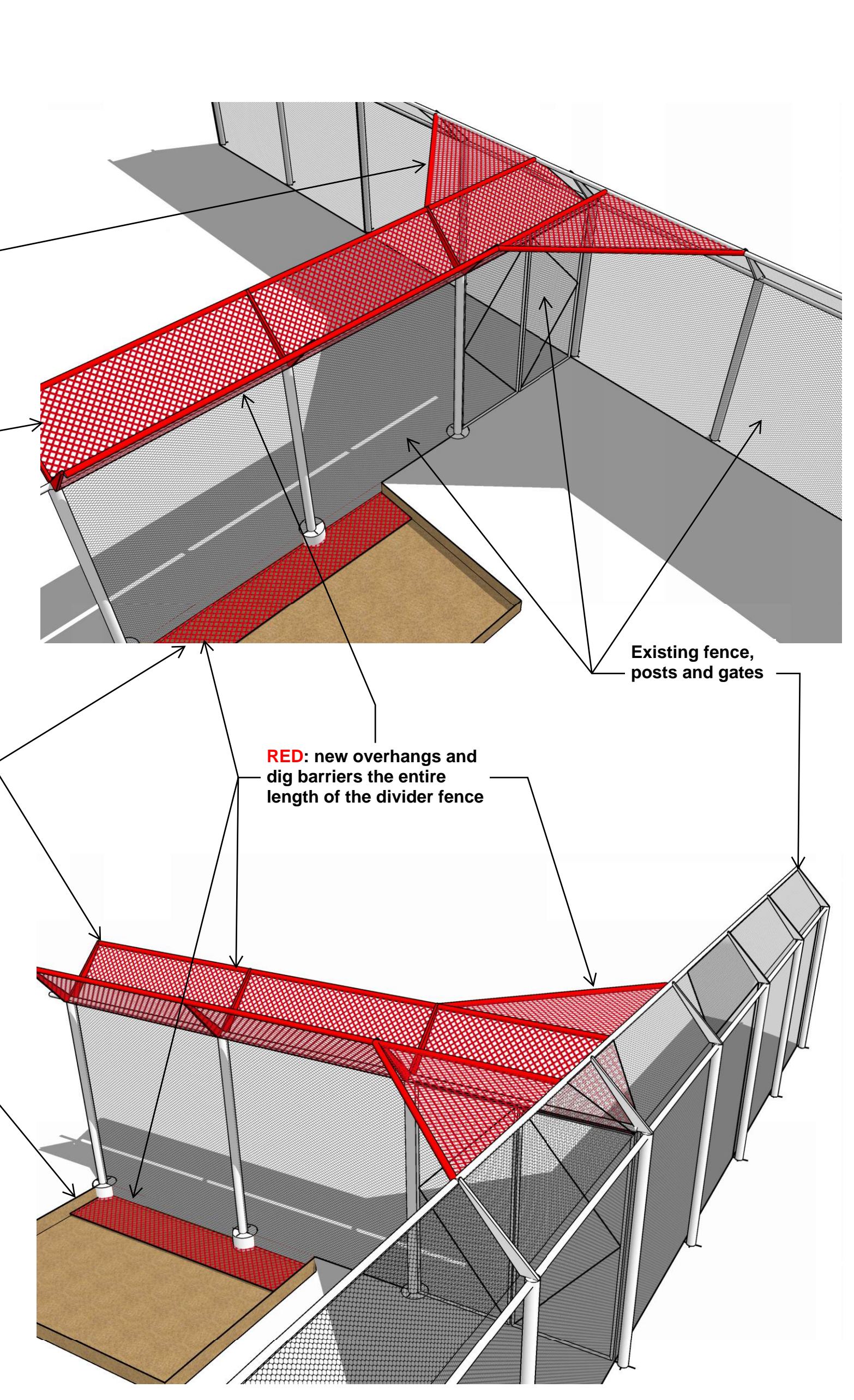
Rev. #	Revision Date



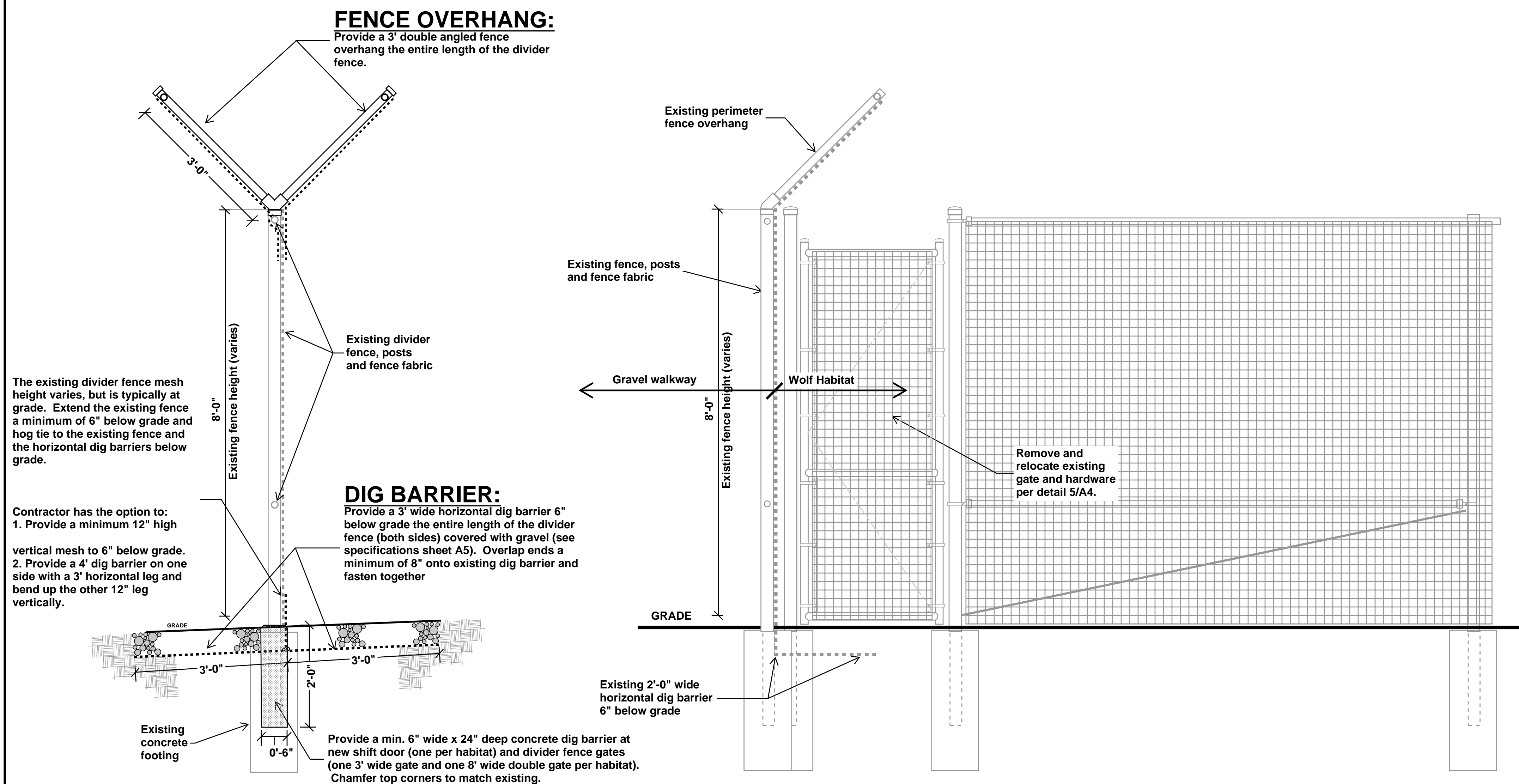
**1 Existing Habitat Plan**  
A4 Scale: 1" = 20'-0"



**2 Proposed Habitat Plan (typical)**  
A4 Scale: 1" = 20'-0"

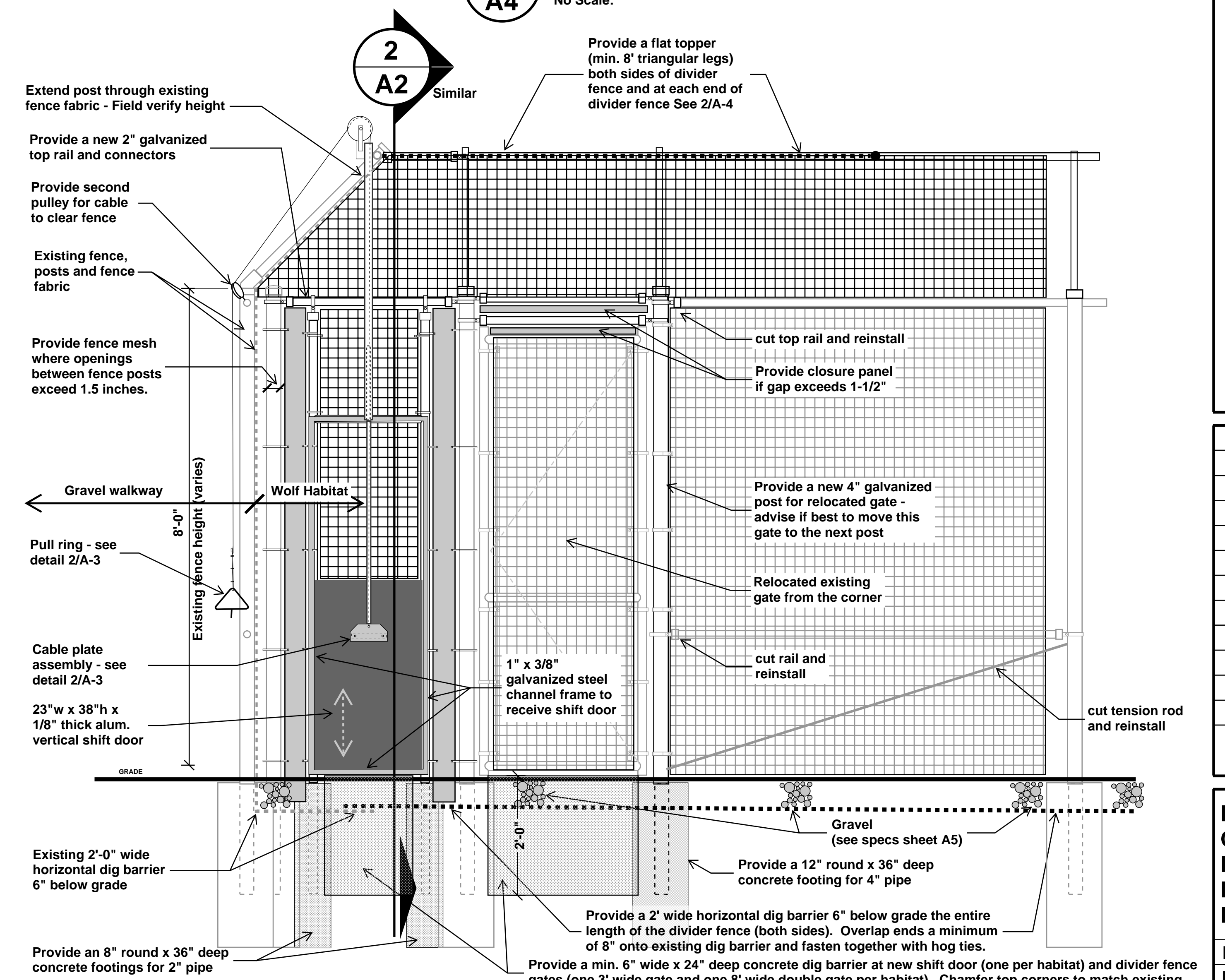


**3 Divider Fence End Detail**  
A4 No Scale:



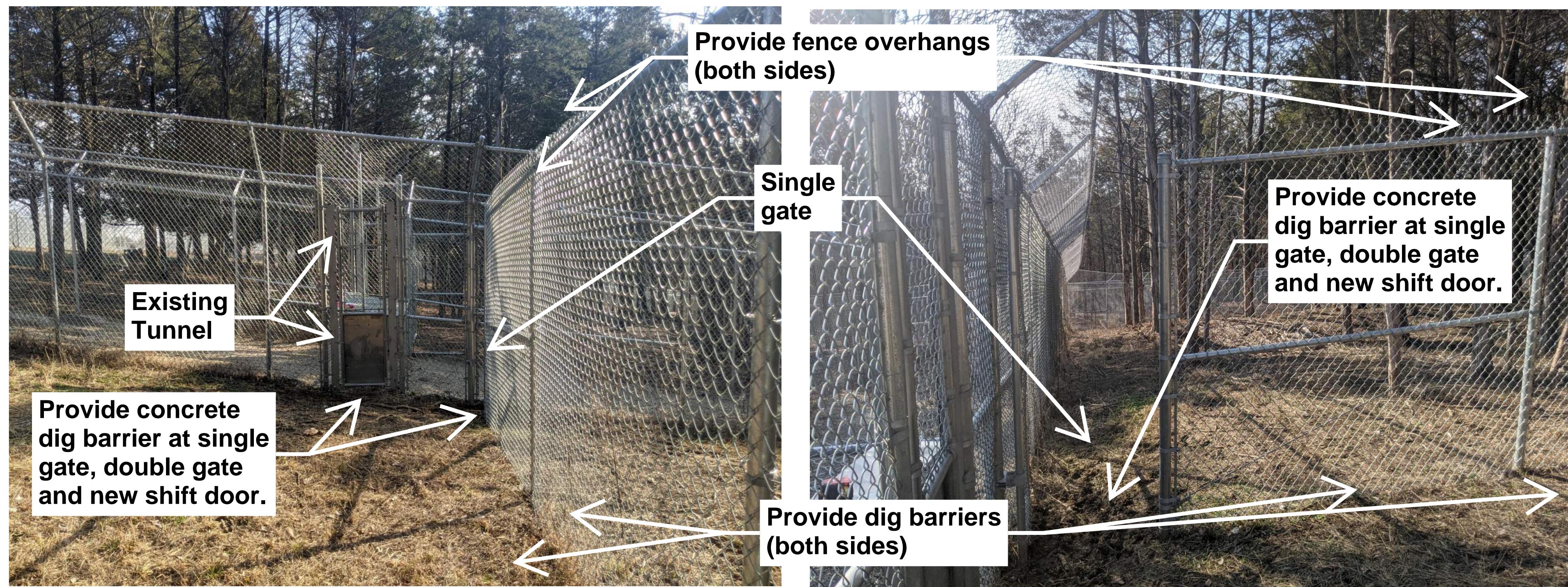
**4 Divider Fence Section**  
A4 Scale: 3/4" = 1'-0"

**5 Existing Divider Fence Elevation**  
A4 Scale: 3/4" = 1'-0"

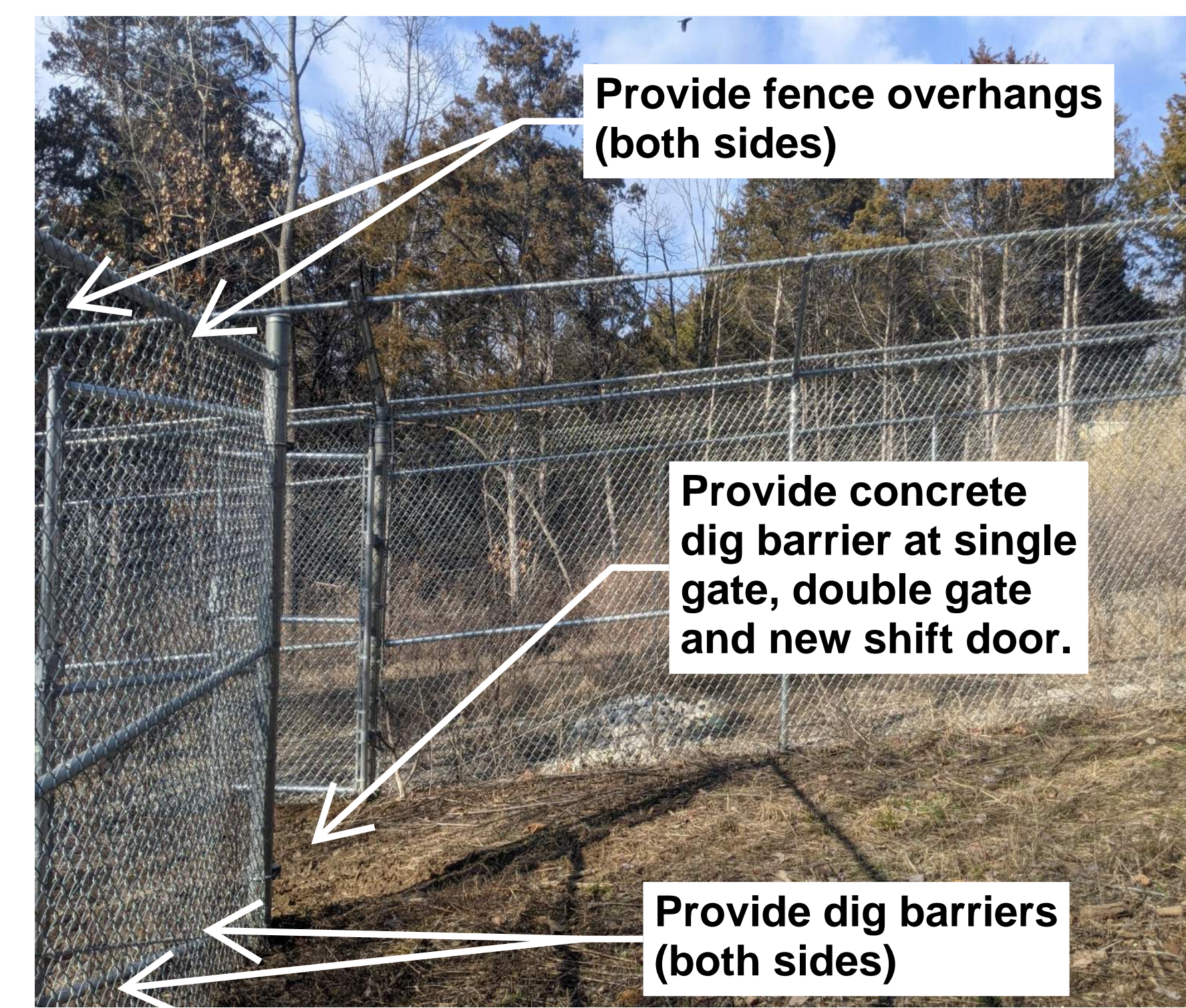


**6 Proposed Shift Door and Gate Relocation**  
A4 Scale: 3/4" = 1'-0"

Rev. #	Revision Date

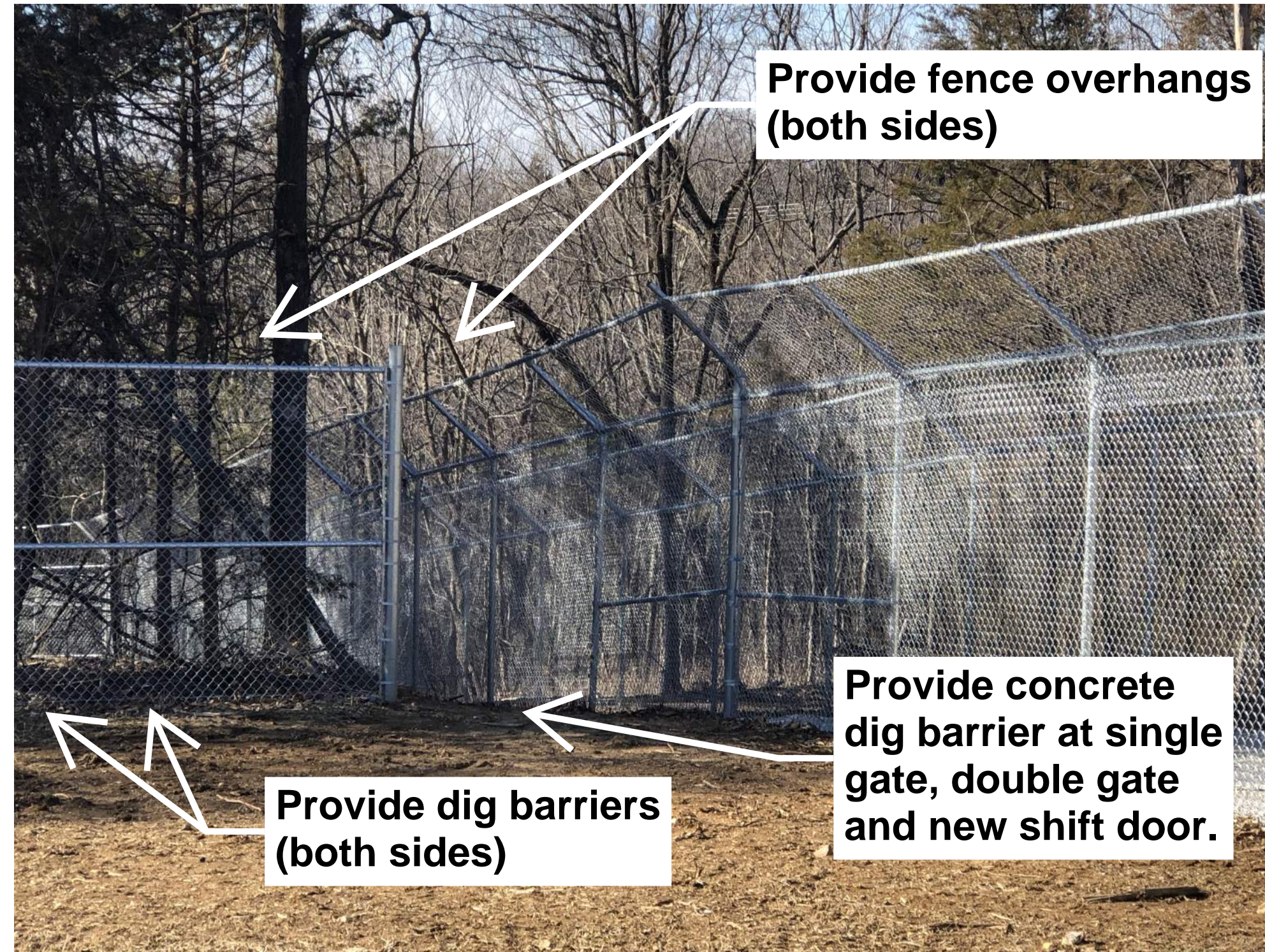


**Photo #11**



**Photo #12**

**Photo #13**



**Photo #14**



**Photo #15**

**SPECIFICATIONS**

**DIVISION 03: CONCRETE**

Minimum specified strength of concrete, compressive at 28 days, shall be 3,500 PSI.

Provide 2" concrete cover for steel posts. Conform to ASTM A-185, Plain finish.

**Gravel at tunnels and over dig barriers:**  
1. Provide 3/4" clean gravel - submit for approval prior to contractor purchasing the gravel.

**DIVISION 32: EXTERIOR IMPROVEMENTS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Chain link fencing.
- B. Fence framework, fabric, and accessories.
- C. Excavation and foundation for post bases.
- D. Chain link swing gates and hardware.

**1.02 RELATED SECTIONS**

- A. Section 033000 - Cast-in-Place Concrete: Concrete anchorage for posts.

**1.03 DEFINITIONS**

- A. Corner Posts: Posts located at a change in horizontal alignment.
- B. End Posts: Posts located at the beginning or end of a length of fence.
- C. Gateposts: Posts supporting the weight of a gate. Gateposts may also function as terminal posts but generally are sized differently.
- D. Line Posts: Posts between terminal posts.
- E. Pull Posts: Posts located within a length of fence at certain distances, and at changes in vertical alignment, to facilitate stretching of fabric.

- F. Terminal Posts: Posts set where fence fabric terminates, and between which the fabric is stretched; a term, which includes end, corner, and pull posts.
- 1.04 REFERENCE STANDARDS**
  - A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
  - B. ASTM A 90/A90M-01 - Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
  - C. ASTM A 121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
  - D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - E. ASTM A 392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
  - F. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - G. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete.
  - H. ASTM F 567 - Standard Practice for Installation of Chain-Link Fence.
  - I. ASTM F 668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
  - J. ASTM F 1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
  - K. CLFMI CLF 2445 - Product Manual, Chain Link Fence Manufacturers Institute.

**1.06 CONTRACT CLOSEOUT SUBMITTALS**

- A. Gates: Complete and detailed operations and maintenance data for each component, including diagrams and part numbers for ordering spare or repair parts.

**1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products described in this section, with not less than three years of documented experience.

**PART 2 - PRODUCTS**

**2.01 CHAIN LINK FENCE**

- A. Fence Configuration:
  - 1. Height: 8 feet, minimum, and as indicated on Drawings.
  - 2. Top rails.
  - 3. Brace rails at each terminal post.
  - 4. Bottom tension wire.
- B. Fence Fabric:
  - 1. Mesh and wire size: 2-inch mesh, 0.148 inch (9 gage).
  - 2. Mesh and wire size: 1-inch mesh, 0.148 inch (9 gage).
  - 3. Galvanized steel finish: ASTM A 392, Class 2, with not less than 2.0 oz. zinc per sq. ft. of uncoated wire surface on wire coated before weaving or not less than 2.0 oz. per sq. ft. of uncoated wire surface on wire of fabric coated after weaving as determined from the average of two or more samples and not less than 1.8 oz. zinc per sq. ft. of uncoated wire surface for any individual sample. Galvanize coating shall not be included in calculating required core wire diameter.
- C. Fence Framework:
  - 1. Steel Pipe: Type 1, ASTM F 1083, standard weight, Schedule 40, minimum yield strength of 25,000 psi.
  - 2. Rail size: 1.660 inches outside diameter, 2.27 lb./ft.
  - 3. Corner and terminal posts: 2.9 inches outside diameter set in concrete.
  - 4. Line Post: 2.4 inch diameter or as required for fence height, set in concrete.
  - 5. Gate Post: 3.5 inch diameter or as required for fence height.
  - 6. Gate Frame: 1.66 inch diameter for welded fabrication or as required for fence height.
  - 7. Zinc coating of steel pipe and steel shapes (ASTM A 90): Interior and exterior coating, 1.8 oz. per sq. ft. of coated area.

**2.02 FITTINGS**

- A. Provide fittings according to ASTM F626.
- B. Caps:
  - 1. Formed steel, malleable or cast iron with ring to receive top rail.
  - 2. Snug-fitting, weather-tight closure of posts.
- C. Rail and Brace Ends: Formed steel, malleable or cast iron.
- D. Wire Ties and Clips:
  - 1. Size: Not less than fabric wire gage.
  - 2. Minimum zinc coating weight: 0.8 ounce per sq. ft.
- E. Brace Bands and Tension Bands:
  - 1. 3/4-inch by 1/10-inch thick (nominal).
- F. Tension Bars:
  - 1. Continuous length to match fabric width.
  - 2. Not required for roll-formed posts with integral fabric weaving loops.
- G. Tension Wire: 7 gage, coil spring wire.
- H. Truss Rods: 5/16-inch minimum diameter rod.
- I. Hardware and lock for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.
- J. Finish: To match fence framework.

**2.03 CONCRETE**

- A. Concrete materials are specified in Division 03.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Verify that line of fence has been properly identified.
- B. Verify that proper grade has been established.
- C. Verify location of underground utilities and structures.
- D. Begin fence construction only after adequate clearance on both sides of fence is available.

**3.02 INSTALLATION - POST**

- A. Layout:
  - 1. Space line posts at equal distance intervals not exceeding 10 feet on center

- measured parallel to grade.
- 2. Locate terminal posts at the beginning and end of each continuous length of fence, at abrupt changes in line or grade, additionally at intervals not to exceed 500 feet, and as otherwise shown on the drawings.
- 3. Install posts plumb and in proper alignment.
- B. Anchorage of Posts in Soil:
  - 1. Set posts in concrete-filled holes, securely braced in proper position until concrete has cured at least 3 days above 60 degrees F.
  - 2. Hole shall be free of loose materials when placing concrete.
  - 3. Hole diameter shall be as recommended by fence manufacturer, but not less than 4 times largest cross section of post.
  - 4. Minimum hole depth for line and terminal posts: 36 inches for fence up to 8 feet high.
  - 5. Increase hole depth as necessary to provide at least 2 inches of cover under bottom of post. Do not allow post to contact soil.
  - 6. Remove and dispose of waste excavation material spread in approved locations, as directed.
  - 7. Thoroughly consolidate concrete.

**3.03 INSTALLATION - CHAIN LINK FENCE**

- A. Install posts, braces, fabric, and other components in accordance with manufacturer's recommendations and approved shop drawings and to meet or exceed requirements of ASTM F 567.
- B. Pull fabric taut and secure to tension wires at 1 foot on both sides of each post and at intervals of 24 inches, maximum, on center.
- C. Secure fabric to line posts with tie wires or clips at intervals of 15 inches, maximum, on center.
- D. Secure fabric to terminal posts for the full width of fabric by using stretcher bars and bands or by integrally weaving fabric to fastening loops on posts.

**3.04 CLEANING**

- A. Clean up debris and unused material, and remove from the site.

**3.05 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch (6 mm).
- B. Maximum Offset From True Position: 1 inch (25 mm).
- C. Components shall not infringe adjacent property lines.

END OF SECTION

Rev. #	Revision Date

Bid Documents

Photos and Specifications

Project #:  
Date: 4/4/2024

SHEET #  
**A-5**