SECTION 32 31 00

ORNAMENTAL SECURITY FENCING AND GATES

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\*\* NOTE TO SPECIFIER \*\* Omega II Fence Systems; ornamental security fencing.  
This section is based on the products of Omega II Fence Systems, which is located at:  
1735 St-Elzear Blvd. W.  
Laval, QC, Canada H7L 3N6  
Toll Free Tel: 800-836-6342  
Tel: 450-686-9600  
Fax: 450-681-7905  
Email: [request info (information@omegatwo.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Omega+II+Fence+Systems&coid=34589&rep=&fax=450-681-7905&message=RE:%20Spec%20Question%20(02825ofs):%20%20&mf=)  
Web: <http://www.omegatwo.com> | <https://www.metaltech.co>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos34/arc34589.html) ] for additional information.  
Omega II is the "original" North American manufacturer who in 1992 introduced to the market a fresh new style of fencing systems. Since then, we can count thousands of projects and millions of linear feet enhancing the image of landscaping projects throughout North America and beyond.  
At Omega II we understand the need for versatility and change in the market place. We dedicate our efforts to offer outstanding fence systems at a competitive price for industrial, commercial, residential and custom designs.   
Our goal is to successfully integrate beauty, security and strength to produce the ideal fence for all projects, deterring even the most motivated trespasser and allowing your concept to shine through.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\*Delete items below not required for project.

* + 1. Ornamental Steel Security Fencing and Gates Including the Following:
       1. Omega II Architectural Fences.
       2. Omega II Elite Fences.
       3. Omega II Evolution Fences.
       4. Omega II Secur Fences.
       5. Omega II Harmony Fences.
       6. Omega II Eco Fences.
       7. Omega II Vertical Grating 10-20 Fences.
       8. Omega II Vertical Grating 80-100 Fences.
       9. Omega II Omega Max Fences
       10. Omega Unik Fence and Accessories.
       11. Swinging Gates.
       12. Cantilever Gates.
       13. Gate Operators.
       14. Remote Controls.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\*Delete any sections below not relevant to this project; add others as required.

* + 1. Section 02 20 00 - Assessment.
    2. Section 31 20 00 - Earth Moving.
    3. Section 32 90 00 - Planting.
    4. Section 03 30 00 - Cast-in-Place Concrete.

\*\* NOTE TO SPECIFIER \*\*Delete paragraph if motorized gates not required.

* + 1. Division 16 - Electrical, electrical service and connections for motor operators, controls, limit switches, other powered devices and for system disconnect switches.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\*Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
       1. ASTM A82: Cold Drawn Steel Wire, Plain, for Concrete Reinforcement.
       2. ASTM A121: Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.
       3. ASTM A185: Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
       4. ASTM A446: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (physical) Quality.
       5. ASTM A500: Standard Specification for Cold formed welded and seamless carbon steel structural tubing in round shapes.
       6. ASTM A513: Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
       7. ASTM A641: Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
       8. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
       9. ASTM A787: Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing.
       10. ASTM A1008: Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy (HSLA) and HSLA with Improved Formability.
       11. ASTM B6: Standard Specification for Zinc.
       12. ASTM B117: Standard Test Method of Salt Spray (Fog) Testing.
       13. ASTM B221: Standard Specification for Aluminum and Aluminum-alloy extruded bars, rods, wire, shapes and tubes.
       14. ASTM D2247: Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
       15. ASTM D2794: Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
       16. ASTM D3359: Standard Test Methods for Measuring Adhesion by Tape.
       17. ASTM F626: Standard Specification for Fence Fittings.
       18. ASTM F900: Standard Specification for industrial and commercial swing gates.
       19. ASTM F934: Standard Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
       20. ASTM F1043: Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
       21. ASTM F1184: Standard Specification for industrial and commercial horizontal slide gates.
       22. ASTM F1234: Standard Specification for protection coatings on steel framework for fences.
       23. ASTM F2919: Standard Specification for Welded Wire Mesh Fence Fabric (Metallic-Coated or Polymer Coated) with Variable Mesh Patterns or Meshes Greater than 6 square inch (3871 mm2) in Panels.
    2. Canadian Standards Association (CSA):
       1. CAN/CSA-A23.1, Concrete - Constituants et Execution des Travaux.
       2. CAN/CSA-G164, Hot Galvanization of Irregular Objects.
    3. Canadian General Standards Board (CGSB):
       1. CAN/CGSB-138.1, Steel Meshes for fence.
       2. CAN/CGSB-138.2, Steel mounting galvanized for fence.
       3. CAN/CGSB-138.3, Installation of the latticed fences.
       4. CAN/CGSB-138.4, Gates for fences.
       5. CAN/CGSB-1.181, Rich zinc coating, organic, prepared.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Material descriptions, construction details, dimensions of individual components and profiles, and finishes for the following:
        1. Fence and gate posts, rails, and fittings.
        2. Gates and hardware.

\*\* NOTE TO SPECIFIER \*\*Include gate operators and motors for automatic gates. Delete if not required.

* + - 1. Gate operators, including operating instructions.
      2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
    1. Shop Drawings:
       1. Show locations of fence, each gate, posts, rails, and details of gate swing, or other operation, hardware, and accessories.
       2. Indicate materials, dimensions, sizes, weights, and finishes of components.
       3. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage, attachment and bracing.
       4. Installation procedures and instructions describing details for a typical fence and gates.

\*\* NOTE TO SPECIFIER \*\* Include gate operators for automatic gates. Delete if not required.

* + - 1. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.

\*\* NOTE TO SPECIFIER \*\* Include wiring diagrams for automatic gates. Delete if not required.

* + - 1. Wiring Diagrams: Power and control wiring, communication features, and access control features. Differentiate between factory-installed and field-installed wiring and between components provided by fence manufacturer and those provided by sections.

\*\* NOTE TO SPECIFIER \*\*Delete if not required. A paper color sample will be available upon request.

* + 1. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square or long, representing actual color.
    2. Qualification Data: For firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
    3. Maintenance Data: Provide a maintenance guide and parts list.
  1. QUALITY ASSURANCE
     1. Installer Qualifications: Minimum 2 years experience installing fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
     2. Source Limitations for Fences and Gates: Obtain each component for fences and gates from one source with resources to provide fences and gates of consistent quality in appearance and physical properties.

\*\* NOTE TO SPECIFIER \*\*For electric gates only. Delete if not required.

* + - 1. Electrical Components, Devices, and Accessories: listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
      2. Provide gate operators that comply with UL 325.

\*\* NOTE TO SPECIFIER \*\*For electric gates only. Delete if not required.

* + 1. Electrical Components, Devices, and Accessories: listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
    2. UL Standard: Provide gate operators that comply with UL 325.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* + 1. System Requirements: Emergency Access Requirements shall comply with requirements of authorities having jurisdiction for automatic gate operators serving as a required means of access.
       1. Coordinate with door hardware and site security requirements.
       2. Coordinate direction of entering and exiting traffic with life safety plans.

\*\* NOTE TO SPECIFIER \*\*Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of overall appearance and application workmanship.
       1. Construct areas designated by Architect.
       2. Do not proceed with remaining work until workmanship and material are approved by Architect.
       3. Correct mock-up installation as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's tagged and unopened packaging until ready for installation.
     2. Handle products in accordance with manufacturers instructions.
  2. PROJECT CONDITIONS
     1. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions:
        1. Notify local utility marking services before beginning work.
        2. Unless otherwise indicated in the general provisions of the contract, notify Architect no less than two days in advance of proposed utility interruptions.
        3. Do not proceed with utility interruptions without Architect's written permission.
     2. Field Measurements: Verify layout information for fences and gates shown on drawings in relation to property survey and existing structures. Verify dimensions by field measurements.
  3. WARRANTY

\*\* NOTE TO SPECIFIER \*\*Omega II guarantees, against any and all defects, the quality of the galvanized and polyester-coated steel fence products sold under the Omega Architectural Fence System or the Double Wire Fence System brand names Evolution, Elite, Secur, Vertical Grating or Omega Max. Evolution is manufactured with a galvanized finish.

* + 1. Manufacturer's Warranty: Provide manufacturer's standard ten year limited warranty for finish.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Omega II Fence Systems, which is located at: 1735 St-Elzear Blvd. W.; Laval, QC, Canada H7L 3N6; Toll Free Tel: 800-836-6342; Tel: 450-686-9600; Fax: 450-681-7905; Email: [request info (information@omegatwo.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Omega+II+Fence+Systems&coid=34589&rep=&fax=450-681-7905&message=RE:%20Spec%20Question%20(02825ofs):%20%20&mf=); Web: <http://www.omegatwo.com> | <https://www.metaltech.co>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
       1. All substitution approval requests shall be accompanied by manufacturing drawings and specifications, and they shall meet all specifications for design, size, gauge of metal parts, and fabrication.

\*\* NOTE TO SPECIFIER \*\*Omega Architectural adds beauty and ambience with uniquely modern design. Delete if not required.

* 1. OMEGA II ARCHITECTURAL FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Actual dimensions are 49 inches (1245 mm), 61 inches (1549 mm), 70 inches (1778 mm), 97 inches (2464 mm). Delete options not required.

* + 1. Height:
       1. 4 feet (1245 mm).
       2. 5 feet (1549 mm).
       3. 6 feet (1778 mm).
       4. 8 feet (2464 mm).
       5. Multiple stacked panels as shown on the Drawings.
    2. Architectural Self-Supporting Steel Mesh Fence Panels:
       1. 92-3/4 inch (2356 mm) wide, welded by resistance using 6 gauge - 0.192 inch (4.88 mm) pre-galvanized steel wire, welded at each crossing to form rectangles 2 x 6 inch (50 x 150 mm).
       2. Cold rolled wire with tensile strength of at least 75,000 psi (515 Mpa) and a 2,172 lbs (985 Kg) breaking strength in accordance with ASTM A185 and A853.
       3. One end of the vertical wires of the panel shall extend 1 inch (25 mm) from the last or the first horizontal wire to create a spiked top or bottom depending on installed position. The other end is cut flush.
       4. Panels shall have the following number of folds at 92.75 inches (2356 mm) wide based on the panel height:

\*\* NOTE TO SPECIFIER \*\*Select height and number of folds. Delete options not required.

* + - * 1. 4 feet (1245 mm): 2 folds.
        2. 5 feet (1549 mm): 2 folds.
        3. 6 feet (1778 mm): 3 folds.
        4. 8 feet (2464 mm): 4 folds.
      1. Panel camber may not exceed 0.094 inch (2.5 mm).
    1. Square Posts: Cold rolled 1008 grade steel to meet ASTM 500 and ASTM A787 and the following maximum horizontal loads, length as required for installation type:

\*\* NOTE TO SPECIFIER \*\*Select installation type. Delete option not required.

* + - 1. Installation: In ground, post length as required for local frost line requirements.
      2. Installation: Surface mounted, flanged.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 4 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 329 pound (149 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 578 pound (262 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1383 pound (627 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 5 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 263 pound (119 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 463 pound (210 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1106 pound (501 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 6 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 385 pound (175 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 922 pound (418 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 8 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 289 pound (131 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 691 pound (313 kg) maximum horizontal load.
    1. Post Brackets:

\*\* NOTE TO SPECIFIER \*\*Select bracket type. Delete option not required.

* + - 1. Universal Post Bracket Kit, Includes the following: 13 gauge (2.4mm) steel collar, nut, washer and carriage bolt 1/4 x 1-1/4 inch (6.4 x 32 mm), all galvanized steel.
         1. For 90 degrees turns, use the same bracket.

b.For different angles, use universal angle brackets.  
\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Delete option not required.

* + - * 1. For 4 foot (1245 mm) high panels: Provide 4 brackets per panel.
        2. For 5 foot (1549 mm) high panels: Provide 6 brackets per panel.
        3. For 6 foot (1778 mm) high panels: Provide 6 brackets per panel.
        4. For 8 foot (2464 mm) high panels: Provide 8 brackets per panel.
      1. U-Shaped Bracket Kit, Includes the following: Stainless steel U rod 5/16 inch (8 mm) diameter, rear flange in PVC 1-1/2" x 1-1/8 inches (37.8 x 28.4 mm), forehead support in PVC 5/8" x 1-1/16 (15.2 x 27.5 mm) cosmetic plastic caps and nuts (M8).

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Delete option not required.

* + - * 1. For 4 foot (1245 mm) high panels: Provide 4 brackets per panel.
        2. For 4 foot (1230 mm) high panels: Provide 6 brackets per panel.
        3. For 5 foot (1549 mm) high panels: Provide 6 brackets per panel.
        4. For 6 foot (1778 mm) high panels: Provide 6 brackets per panel.
        5. For 8 foot (2464 mm) high panels: Provide 8 brackets per panel.
    1. Special Panel Fittings (SPF): Hot dipped galvanized steel enable panels to be fastened to any vertical or horizontal surface, such as steel or concrete beams or wood posts. Provide the following model:

\*\* NOTE TO SPECIFIER \*\*Select type. Delete options not required.

* + - 1. SPF-W Kit: For mounting on a vertical surface, consisting of an L-shaped slotted plate, which accommodates a 1-3/4'' (45 mm) vertical adjustment and a retaining plate that hold two vertical wires when bolted together.
      2. SPF-C Kit: for horizontal surfaces, uses the same "L" shaped slotted plate and 2 wire retaining plates.
      3. SPF-P Kit: connects two panels together.
    1. Post Caps:

\*\* NOTE TO SPECIFIER \*\*Select type. Aluminum alloy for posts 2 x 2 inches (50 x 50 mm) to 4 x 4 inches (100 mm x 100 mm). Galvanized steel for larger dimensions. Delete not required.

* + - 1. Aluminum alloy.
      2. Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Delete if overhang extension is not required. Larger dimensions are available on request.

* + 1. Overhang Extension:
       1. Same dimensions as the post, minimum 18 in. (460 mm) long, welded to the end square posts to form a 45 degrees angle to receive a panel of 16 in. (420 mm).
       2. Provide with two fastener kits.
    2. Architectural mesh panels and posts shall be zinc-coated steel wire conforming to specification ASTM A641 (1989) Class 1, and with 4 mils polyester powder coating as specified below.

\*\* NOTE TO SPECIFIER \*\*Elite fences are designed for areas with heavy public usage that require a greater need for protection. Delete if not required.

* 1. OMEGA II ELITE FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Delete options not required.

* + 1. Height:
       1. 4 feet (1230 mm).
       2. 6 feet (1830 mm).
       3. 8 feet (2430 mm).
       4. Multiple stacked panels as shown on the Drawings.
    2. Elite Steel Mesh Fence Panels:
       1. Fabricated welded wire mesh panels zinc-coated steel wire conforming to specification ASTM A641, 98-7/8inches (2511mm) wide, formed by one vertical wire of 0.192 inch (4.88 mm) placed between two horizontal wires of 0.225 inch (5.72 mm), as per ASTM A185 and A853.
       2. The wires are welded by resistance weld at each crossing to form rectangles 1-15/16 x 7-7/8 inches (50 x 200mm).
       3. The cold rolled wire shall have a tensile strength of at least 75,000 psi (515 Mpa) and a 3150 lbs (1430 Kg) break strength for an individual wire.
       4. One end of the vertical wires of the panel shall exceed 1 inch (25 mm) from the last or first horizontal wire creating a spiked top or bottom depending on the position when installed. The other end is cut flush.
       5. Panel camber may not exceed 0.094inch (2.5 mm).
    3. Square Posts: Cold rolled 1008 grade steel to meet ASTM 500 and ASTM A787 and the following maximum horizontal loads, length as required for installation type:

\*\* NOTE TO SPECIFIER \*\*Select installation type. Delete option not required.

* + - 1. Installation: In ground, post length as required for local frost line requirements.
      2. Installation: Surface mounted, flanged.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 4 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 329 pound (149 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 578 pound (262 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1383 pound (627 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 5 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 263 pound (119 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 463 pound (210 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1106 pound (501 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 6 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 385 pound (175 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 922 pound (418 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 8 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 289 pound (131 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 691 pound (313 kg) maximum horizontal load.
    1. Post Brackets:

\*\* NOTE TO SPECIFIER \*\*Select bracket type. Delete option not required.

* + - 1. Universal Post Bracket Kit, Includes the following: 13 gauge (2.4mm) steel collar, nut, washer and carriage bolt 1/4 x 1-1/4 inch (6.4 x 32 mm), all galvanized steel.
         1. For 90 degrees turns, use the same bracket.
         2. For different angles, use universal angle brackets.

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Delete option not required.

* + - * 1. For 4 foot (1230 mm) high panels: Provide 4 brackets per panel.
        2. For 5 foot (1449 mm) high panels: Provide 6 brackets per panel.
        3. For 6 foot (1830 mm) high panels: Provide 6 brackets per panel.
        4. For 8 foot (2430 mm) high panels: Provide 8 brackets per panel.
      1. U-Shaped Bracket Kit, Includes the following: Stainless steel U rod 5/16 inch (8 mm) diameter, rear flange in PVC 1-1/2" x 1-1/8 inches (37.8 x 28.4 mm), forehead support in PVC 5/8" x 1-1/16 (15.2 x 27.5 mm) cosmetic plastic caps and nuts (M8).

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Note: 4 brackets for 4' panels applies to Architectural only. Delete option not required.

* + - * 1. For 4 foot (1230 mm) high panels: Provide 4 brackets per panel.
        2. For 4 foot (1230 mm) high panels: Provide 6 brackets per panel.
        3. For 5 foot (1449 mm) high panels: Provide 6 brackets per panel.
        4. For 6 foot (1830 mm) high panels: Provide 6 brackets per panel.
        5. For 8 foot (2430 mm) high panels: Provide 8 brackets per panel.
    1. Special Panel Fittings (SPF): Hot dipped galvanized steel enable panels to be fastened to any vertical or horizontal surface, such as steel or concrete beams or wood posts. Provide the following model:

\*\* NOTE TO SPECIFIER \*\*Select type. Delete options not required.

* + - 1. SPF-W Kit: For mounting on a vertical surface, consisting of an L-shaped slotted plate, which accommodates a 1-3/4'' (45 mm) vertical adjustment and a retaining plate that hold two vertical wires when bolted together.
      2. SPF-C Kit: for horizontal surfaces, uses the same "L" shaped slotted plate and 2 wire retaining plates.
      3. SPF-P Kit: connects two panels together.
    1. Post Caps:

\*\* NOTE TO SPECIFIER \*\*Select type. Aluminum alloy for posts 2 x 2 inches (50 x 50 mm) to 4 x 4 inches (100 mm x 100 mm). Galvanized steel for larger dimensions. Delete not required.

* + - 1. Aluminum alloy.
      2. Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Delete if overhang extension is not required. Larger dimensions are available on request.

* + 1. Overhang Extension:
       1. Same dimensions as the post, minimum 18 in. (460 mm) long, welded to the end square posts to form a 45 degrees angle to receive a panel of 16 in. (420 mm).
       2. Provide with two fastener kits.
    2. Elite mesh panels and posts shall be zinc-coated steel wire conforming to specification ASTM A641 (1989) Class 1, and with 4 mils polyester powder coating as specified below.

\*\* NOTE TO SPECIFIER \*\*Evolution fences are constructed of strong, rigid panels to eliminate unraveling and deter climbing or cutting. Evolution panels can be used to retrofit existing chain link fence, improving the look and security. Delete if not required.

* 1. OMEGA II EVOLUTION FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Delete options not required.

* + 1. Height:
       1. 4 feet (1230 mm).
       2. 6 feet (1830 mm).
       3. 8 feet (2430 mm).
       4. Multiple stacked panels as shown on the Drawings.
    2. Evolution Steel Mesh Fence Panels:
       1. Fabricated welded wire mesh panels zinc-coated steel wire conforming to specification ASTM A641, 98-7/8 inches (2511mm) wide, formed by one vertical wire of 0.192 inch (4.88 mm) placed between two horizontal wires of 0.225 inch (5.72 mm), as per ASTM A185 and A853.
       2. The wires are welded by resistance weld at each crossing to form rectangles 1-15/16 x 7-7/8 inches (50 x 200mm).
       3. The cold rolled wire shall have a tensile strength of at least 75,000 psi (515 Mpa) and a 3150 lbs (1430 Kg) break strength for an individual wire.
       4. One end of the vertical wires of the panel shall exceed 1 inch (25 mm) from the last or first horizontal wire creating a spiked top or bottom depending on the position when installed. The other end is cut flush.
    3. Evolution steel mesh panels are welded at each intersection into a solid one-piece mesh sheet. Mesh panels are hot dipped galvanized in conformity with ASTM A123/A123M (GAW).
    4. End-to-End Connectors: Allow panels to be connected without requiring a post in accordance with the following:

\*\* NOTE TO SPECIFIER \*\*Select the following for 4 foot (1230 mm) high fences. Delete if not required.

* + - 1. Quantity per Panels: 3 Eye-U-Brackets and 4 End-to-End Connectors.

\*\* NOTE TO SPECIFIER \*\*Select the following for 6 foot (1830 mm) high fences. Delete if not required.

* + - 1. Quantity per Panels: 3 Eye-U-Brackets and 5 End-to-End Connectors.

\*\* NOTE TO SPECIFIER \*\*Select the following for 8 foot (2430 mm) high fences. Delete if not required.

* + - 1. Quantity per Panels: 4 Eye-U-Brackets and 7 End-to-End Connectors.
    1. Special Panel Fittings (SPF): Hot dipped galvanized steel enable panels to be fastened to any vertical or horizontal surface, such as steel or concrete beams or wood posts. Provide the following model:

\*\* NOTE TO SPECIFIER \*\*Select type. Delete options not required.

* + - 1. SPF-W Kit: For mounting on a vertical surface, consisting of an L-shaped slotted plate, which accommodates a 1-3/4'' (45 mm) vertical adjustment and a retaining plate that hold two vertical wires when bolted together.
      2. SPF-C Kit: for horizontal surfaces, uses the same "L" shaped slotted plate and 2 wire retaining plates.
      3. SPF-P Kit: connects two panels together.
    1. Chain Link Fence Fittings: to ASTM F 626. All ferrous metal fittings shall be galvanized.
    2. Tie Wire or twist ties may be used or added if required. Minimum 9 gauge, 0.148 inch (3.76 mm) galvanized steel or aluminum for attachment of panels to posts.
    3. Stretcher bands: fabric bands and brace bands shall be galvanized pressed steel.
    4. Fasteners: All nuts and bolts to be galvanized.

\*\* NOTE TO SPECIFIER \*\*Square fence posts may be used by request for Evolution. If square posts are used modify to meet manufacturers requirements.

* + 1. Evolution Round Fence Posts:
       1. New line (intermediate), End and Corner Posts: 2-3/8 inch (60.0mm) diameter, minimum 24 to 36 inches (610 mm to 914mm) longer than the height of the panel for installation in the ground depending on local frost line requirements.
       2. Steel Pipe Posts: Cold formed with minimum yield strength of 50,000 psi (344 MPa) and produced in accordance with ASTM F1043.
       3. To upgrade an existing facility, keep the same posts or slide a new oversized post over the existing posts using the same foundation if acceptable to the Owner. Affix new posts with tap screws located at the base. No pull post, rail or braces are required.
    2. Evolution Round Fence Posts Brackets:
       1. Manufacturer's standard eye-U-bracket kit designed to wrap around 2-3/8'' (60 mm) or 3-1/2 inch (88,9 mm) round posts, including one pre-galvanized 1/4 inch (32mm) wire eye-U-bracket, one 1/8 inch (3mm) thick retaining plate hot dip galvanized, two nuts, washers and carriage bolts 5/16 x 1 1/4 inch (8 x 32 mm), all galvanized steel.
       2. Hardware allows for straight line and turns, each turn requires a post. For 90 degree turns, use the manufacturer's stretcher band.
    3. Evolution Post Caps:

\*\* NOTE TO SPECIFIER \*\*Select type. Aluminum alloy applies for square posts 2 x 2 inches (50 x 50 mm) to 4 x 4 inches (102 mm x 102 mm). Galvanized steel is used for larger dimensions and round posts. Delete not required.

* + - 1. Aluminum alloy.
      2. Galvanized steel.
    1. Evolution Swing Gates:
       1. Gate Posts: Cold rolled from 1008 grade steel. Dimension corresponding to posts including cap and SPF-W kit for adjacent panel mounting
       2. Gate Frames: Fabricated in accordance with ASTM F900 using galvanized steel members 1.90 inch (48.3 mm) outside diameter, weighing 2.28 lb/ft (3.30 kg/m), welded at all corners to create a rigid frame. Welded joints shall be coated in accordance with ASTM A780, employing a zinc-rich paint.

\*\* NOTE TO SPECIFIER \*\*Include for gates over 8 feet (2440 mm). Delete not required.

* + - * 1. Gates over 8 feet (2440 mm) high or 8 feet (2440 mm) wide shall have horizontal or vertical members.
      1. Gate Mesh: Filler shall match that shown in the fence section. Mesh panel to be attached to frame with fabric bands at the external vertical members, and with J-bolts or hook bolts to horizontal and internal vertical members. Bands and J-bolts, hook bolts maximum of 18 inch (460 mm) centers.
      2. Gate Hardware: ASTM F900 for hinges, latch, drop rods, hot-dip galvanized steel, and sized to assure proper gate operation.
      3. Hinge: Structurally designed by manufacturer to support gates without deformation during opening and closing and capable of swinging 180 degrees (3.14 rad) in or out.
      4. Latch: Clamp-on gravity system, self-latching.
      5. Double Gates Hardware: One drop bar to secure in closed position one of the gate leaves, complete with stop pipe to engage the center drop rod, and gate keeper mechanical device with gravity-lock system that fasten each gate leaf when in full open position.
    1. Dimensions and Nominal Weights for Gate Leafs in Single Openings:

\*\* NOTE TO SPECIFIER \*\* Panel heights less than 6 feet (1830), with gates 4 ft. (1220 mm) or less. Delete if not required.

* + - 1. Outside Diameter: 2-3/8 inches (60.3 mm). Nominal Weight: 3.12 lb/ft (4.6 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights less than 6 feet (1830), with gates 4 ft. (1220 mm) to 10 ft. (3050 mm). Delete if not required.

* + - 1. Outside Diameter: 2-7/8 inches (73.0 mm). Nominal Weight: 4.64 lb/ft (6.9 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights less than 6 feet (1830), with gates 10 ft. (3050 mm) to 18 ft (5490 mm). Delete if not required.

* + - 1. Outside Diameter: 4 inches (101.6 mm). Nominal Weight: 6.56 lb/ft (9.8 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights less than 6 feet (1830), with gates 18 ft. (5490 mm) to 24 ft (7320 mm). Delete if not required.

* + - 1. Outside Diameter: 6-1/4 inches (168.3 mm). Nominal Weight: Per manufacturer.

\*\* NOTE TO SPECIFIER \*\* Panel heights over 6 feet (1830), with gates up to 6 ft. (1830 mm) or less. Delete if not required.

* + - 1. Outside Diameter: 4 inches (101.6 mm). Nominal Weight: 9.11 lb/ft (13.5 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights over 6 feet (1830 mm), with gates 6 ft. (1830 mm) to 12 feet (3660 mm). Delete if not required.

* + - 1. Outside Diameter: 6-5/8 inches (168.3 mm). Nominal Weight: 18.97 lb/ft (28.2 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights over 6 feet (1830 mm), with gates 12 ft. (3660 mm) to 18 feet (5490 mm). Delete if not required.

* + - 1. Outside Diameter: 8-1/4 inches (219.1 mm). Nominal Weight: 28.58 lb/ft (42.5 kg/m).

\*\* NOTE TO SPECIFIER \*\* Panel heights over 6 feet (1830 mm), with gates 18 ft. (5490 mm) to 24 feet (7320 mm). Delete if not required.

* + - 1. Outside Diameter: 2-7/8 inches (73.0 mm). Nominal Weight: 5.79 lb/ft (8.6 kg/m).
    1. Gate Framing Members for Round Pipe Swing Gates:

\*\* NOTE TO SPECIFIER \*\* For gates 6 ft. (1830 mm) or less in height or width. Delete if not required.

* + - 1. Outside Diameter: 1.660 inches (42.2 mm). Nominal Weight: 1.83 lb/ft (2.7 kg/m).

\*\* NOTE TO SPECIFIER \*\* For gates from 6 ft. (1830 mm) to 8 ft. (2440 mm) in height or width. Delete if not required.

* + - 1. Outside Diameter: 1.9 inches (48.3 mm). Nominal Weight: 2.28 lb/ft (3.3 kg/m).
      2. Provide the following for interior bracing, swing or roll gates, when required or recommended by the manufacturer:
         1. Outside Diameter: 1.660 inches (42.2 mm). Nominal Weight: 1.83 lb/ft (2.7 kg/m).
    1. Cantilever Gates: Comply with requirements below.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. OMEGA II SECUR FENCES

\*\* NOTE TO SPECIFIER \*\* Select height. Delete options not required.

* + 1. Height:
       1. 4 feet (1230 mm).
       2. 6 feet (1830 mm).
       3. 8 feet (2430 mm).
       4. Multiple stacked panels as shown on the Drawings.
    2. Secur Steel Mesh Fence Panels:
       1. Fabricated welded wire mesh panels zinc-coated steel wire conforming to specification ASTM A641, 98-7/8inches (2511mm) wide, formed by one vertical wire of 0.225 inch (5.72 mm) placed between two horizontal wires of 0.303 inch (7.70 mm), as per ASTM A185 and A853.
       2. The wires are welded by resistance weld at each crossing to form rectangles 1-15/16 x 7-7/8 inches (50 x 200mm).
       3. The cold rolled wire shall have a tensile strength of at least 75,000 psi (515 Mpa) and a 3150 lbs (1430 Kg) break strength for the 0.225 inch (5.72 mm) wires and of 5600 lbs (2545 Kg) for the 0.303 inch (7.70 mm) wires.
       4. One end of the vertical wires of the panel shall exceed 1 inch (25 mm) from the last or first horizontal wire creating a spiked top or bottom depending on the position when installed. The other end is cut flush.
       5. Panel camber may not exceed 0.094inch (2.5 mm).
    3. Square Posts: Cold rolled 1008 grade steel to meet ASTM 500 and ASTM A787 and the following maximum horizontal loads, length as required for installation type:

\*\* NOTE TO SPECIFIER \*\*Select installation type. Delete option not required.

* + - 1. Installation: In ground, post length as required for local frost line requirements.
      2. Installation: Surface mounted, flanged.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 4 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 329 pound (149 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 578 pound (262 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1383 pound (627 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 5 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 263 pound (119 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 463 pound (210 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1106 pound (501 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 6 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 385 pound (175 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 922 pound (418 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 8 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 289 pound (131 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 691 pound (313 kg) maximum horizontal load.
    1. Post Brackets:

\*\* NOTE TO SPECIFIER \*\*Select bracket type. Delete option not required.

* + - 1. Universal Post Bracket Kit, Includes the following: 13 gauge (2.4mm) steel collar, nut, washer and carriage bolt 1/4 x 1-1/4 inch (6.4 x 32 mm), all galvanized steel.
         1. For 90 degrees turns, use the same bracket.
         2. For different angles, used universal angle brackets.

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Delete option not required.

* + - * 1. For 4 foot (1230 mm) high panels: Provide 4 brackets per panel.
        2. For 5 foot (1449 mm) high panels: Provide 6 brackets per panel.
        3. For 6 foot (1830 mm) high panels: Provide 6 brackets per panel.
        4. For 8 foot (2430 mm) high panels: Provide 8 brackets per panel.
      1. U-Shaped Bracket Kit, Includes the following: Stainless steel U rod 5/16 inch (8 mm) diameter, rear flange in PVC 3-1/2' x 1-1/2' x 1-1/8 inches (88.7 x 37.8 x 28.4 mm), forehead support in PVC 2-3/8' x 5/8' x 1-1/16 (60.4 x 15.2 x 27.5 mm) cosmetic plastic caps and nuts (M8).

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Note: 4 brackets for 4' panels applies to Architectural only. Delete option not required.

* + - * 1. For 4 foot (1230 mm) high panels: Provide 4 brackets per panel.
        2. For 4 foot (1230 mm) high panels: Provide 6 brackets per panel.
        3. For 5 foot (1449 mm) high panels: Provide 6 brackets per panel.
        4. For 6 foot (1830 mm) high panels: Provide 6 brackets per panel.
        5. For 8 foot (2430 mm) high panels: Provide 8 brackets per panel.
    1. Special Panel Fittings (SPF): Hot dipped galvanized steel enable panels to be fastened to any vertical or horizontal surface, such as steel or concrete beams or wood posts. Provide the following model:

\*\* NOTE TO SPECIFIER \*\*Select type. Delete options not required.

* + - 1. SPF-W Kit: For mounting on a vertical surface, consisting of an L-shaped slotted plate, which accommodates a 1-3/4'' (45 mm) vertical adjustment and a retaining plate that hold two vertical wires when bolted together.
      2. SPF-C Kit: for horizontal surfaces, uses the same "L" shaped slotted plate and 2 wire retaining plates.
      3. SPF-P Kit: connects two panels together.
    1. Post Caps:

\*\* NOTE TO SPECIFIER \*\*Select type. Aluminum alloy for posts 2 x 2 inches (50 x 50 mm) to 4 x 4 inches (100 mm x 100 mm). Galvanized steel for larger dimensions. Delete not required.

* + - 1. Aluminum alloy.
      2. Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Delete if overhang extension is not required. Larger dimensions are available on request.

* + 1. Overhang Extension:
       1. Same dimensions as the post, minimum 18 in. (460 mm) long, welded to the end square posts to form a 45 degrees angle to receive a panel of 16 in. (420 mm).
       2. Provide with two fastener kits.
    2. Secur mesh panels and posts shall be zinc-coated steel wire conforming to specification ASTM A641 (1989) Class 1, and with 4 mils polyester powder coating as specified below.

\*\* NOTE TO SPECIFIER \*\*Harmony fence system includes an appealing curvaceous design with reinforcing v-bends, see through panels, and no top rail or bulkiness using a vertical post and flange system. Delete if not required.

* 1. OMEGA II HARMONY FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Delete options not required. Actual imperial dimensions are 503/4" for 4ft and 74.375" for 6ft

* + 1. Height:
       1. 4 feet (1289 mm).
       2. 6 feet (1889 mm).
    2. Harmony Self-Supporting Steel Mesh Fence Panels:
       1. Wire mesh fence panels measuring 92-3/4 inch (2356 mm) wide are welded by resistance as per ASTM-A185 using 6 gauge 0.192 inch (4.88 mm) pre-galvanized steel wire for the vertical wire.
       2. Wires are welded at each crossing on 0.225 inch (5.72 mm) pre-galvanized horizontal steel wire to form a rectangle of 2 x 7.875 inches (50 x 200 mm).
       3. Cold rolled wires have a minimum tensile strength of 75,000 psi (515 Mpa) and a 2,172 lb (985 Kg) breaking strength.
       4. The two last horizontal wires at the top edge of the panel are welded with a curved shape and spaced at 2 inches (50 mm) between wires.
       5. The lower curved wire starts at 3.5 inches (90 mm) from the last horizontal wire each end of the panel.
       6. All the vertical wires on the top of the panel are bended thereby creating an arrow shape and shall exceed 3.5 inches (90 mm) from the last curved horizontal wire.
       7. The vertical wires on the bottom of panel are cut flush.
       8. Panels shall have the following number of folds at 92.75 inches (2356 mm) wide based on the panel height:

\*\* NOTE TO SPECIFIER \*\*Select height and number of folds. Delete options not required.

* + - * 1. 4 feet (1289 mm): 2 folds.
        2. 6 feet (1889 mm): 3 folds.
      1. Panel camber may not exceed 0.094 inch (2.5 mm).
    1. Harmony Post Performance Requirements:

\*\* NOTE TO SPECIFIER \*\*Select one the following for 4 foot high fences. Delete if not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 329 pounds (149 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 578 pound (262 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 6 foot high fences. Delete if not required.

* + - 1. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1106 pound (502 kg) maximum horizontal load
    1. Harmony mesh panels and posts shall be zinc-coated steel wire conforming to specification ASTM A641 (1989) Class 1, and with 4 mils polyester powder coating as specified below.

\*\* NOTE TO SPECIFIER \*\*Eco fence systems are an assembly of two welded wire panels that protect plants and foliage for increased privacy while allowing easy access for plant maintenance. System is promoted with the Architectural panel but may also be used with Elite or Secure double wire system. Delete if not required.

* 1. OMEGA II ECO FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Delete options not required.

* + 1. Height:
       1. 4 feet (1245 mm).
       2. 5 feet (1549 mm).
       3. 6 feet (1778 mm).
       4. 8 feet (2464 mm).
       5. Multiple stacked panels.
    2. Eco Self-Supporting Steel Mesh Fence Panels:
       1. The OMEGA ECO system is in a combination of two panels separated by a 5'' or 6'' (125 mm or 150 mm) gap.

\*\* NOTE TO SPECIFIER \*\*Select Elite or Secur below if used, if not retain mesh panel description below.

* + - 1. Provide with Elite Wire mesh as specified above.
      2. Provide with Secur wire mesh as specified above.

\*\* NOTE TO SPECIFIER \*\*If Elite or Secur is used, with of the panels must be changed to 98-5/8 inches (2505mm).

* + - 1. Wire mesh fence panels are 92-3/4 inches ( 2356 mm) wide, welded by resistance using 6 gauge 0.192 inch (4.88 mm) pre-galvanized steel wire, welded at each crossing to form rectangles of 2 x 6 inches (50 x 150 mm).
      2. The cold rolled wire shall have a tensile strength of at least 75,000 psi (515 Mpa) and 2,172 lbs (985 Kg) break strength.
      3. One end of the vertical wires of the panel shall exceed 1 inch (25 mm) from the last or the first horizontal wire creating a spiked top or bottom depending on position when installed. The other end is cut flush.
      4. Panels shall have the following number of folds at 92.75 inches (2356 mm) wide based on the panel height:

\*\* NOTE TO SPECIFIER \*\*Select height and number of folds. Delete options not required.

* + - * 1. 4 feet (1245 mm): 2 folds.
        2. 5 feet (1549 mm): 2 folds.
        3. 6 feet (1778 mm): 3 folds.
        4. 8 feet (2464 mm): 4 folds.
      1. Panel camber may not exceed 0.094inch (2.5 mm).
    1. Square Posts: Cold rolled 1008 grade steel to meet ASTM 500 and ASTM A787 and the following maximum horizontal loads, length as required for installation type:

\*\* NOTE TO SPECIFIER \*\*Select installation type. Delete option not required.

* + - 1. Installation: In ground, post length as required for local frost line requirements.
      2. Installation: Surface mounted, flanged.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 4 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 329 pound (149 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 578 pound (262 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1383 pound (627 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 5 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 16 gauge (1.6 mm), 263 pound (119 kg) maximum horizontal load.
         2. 11 gauge (3.0 mm), 463 pound (210 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 1106 pound (501 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 6 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 385 pound (175 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 922 pound (418 kg) maximum horizontal load.

\*\* NOTE TO SPECIFIER \*\*Select one the following for 8 foot high fences. Delete options not required.

* + - 1. Post Size: 2 x 2 inch (50 x 50 mm):
         1. 11 gauge (3.0 mm), 289 pound (131 kg) maximum horizontal load.
      2. Post Size: 3 x 3 inch (75 x 75 mm):
         1. 11 gauge (3.0 mm), 691 pound (313 kg) maximum horizontal load.
    1. Post Brackets:

\*\* NOTE TO SPECIFIER \*\*Select bracket type. Delete option not required.

* + - 1. ECO Post Bracket Kit, Includes the following: 14 gauge (2.6mm) steel collar and wire retaining plate 1/4 x 1 inch (6.3 x 25 mm), nut, washer and carriage bolt 5/16 x 1-1/4 inch (8.0 x 32 mm), all galvanized steel.

\*\* NOTE TO SPECIFIER \*\*Select number of brackets based on height. Delete option not required.

* + - * 1. For 4 foot (1245 mm) high panels: Provide 2 brackets per post.
        2. For 5 foot (1549 mm) high panels: Provide 3 brackets per post.
        3. For 6 foot (1778 mm) high panels: Provide 3 brackets per post.
        4. For 8 foot (2464 mm) high panels: Provide 4 brackets per post.
      1. U-Shaped Bracket Kit, Includes the following: Stainless steel U rod 5/16 inch (8 mm) diameter, rear flange in PVC 3-1/2' x 1-1/2' x 1-1/8 inches (88.7 x 37.8 x 28.4 mm), forehead support in PVC 2-3/8' x 5/8' x 1-1/16 (60.4 x 15.2 x 27.5 mm) cosmetic plastic caps and nuts (M8).
    1. Special Panel Fittings (SPF): Hot dipped galvanized steel enable panels to be fastened to any vertical or horizontal surface, such as steel or concrete beams or wood posts. Provide the following model:

\*\* NOTE TO SPECIFIER \*\*Select type. Delete options not required.

* + - 1. SPF-W Kit: For mounting on a vertical surface, consisting of an L-shaped slotted plate, which accommodates a 1-3/4'' (45 mm) vertical adjustment and a retaining plate that hold two vertical wires when bolted together.
      2. SPF-C Kit: for horizontal surfaces, uses the same "L" shaped slotted plate and 2 wire retaining plates.
      3. SPF-P Kit: connects two panels together.
    1. Post Caps:

\*\* NOTE TO SPECIFIER \*\*Select type. Aluminum alloy for posts 2 x 2 inches (50 x 50 mm) to 4 x 4 inches (100 mm x 100 mm). Galvanized steel for larger dimensions. Delete if not required.

* + - 1. Aluminum alloy.
      2. Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* Delete if overhang extension is not required. Larger dimensions are available on request.

* + 1. Overhang Extension:
       1. Same dimensions as the post, minimum 18 in. (460 mm) long, welded to the end square posts to form a 45 degrees angle to receive a panel of 16 in. (420 mm).
       2. Provide with two fastener kits.
    2. Eco mesh panels and posts shall be zinc-coated steel wire conforming to specification ASTM A641 (1989) Class 1, and with 4 mils polyester powder coating as specified below.

\*\* NOTE TO SPECIFIER \*\*Vertical grating fences are made with a combination of flat vertical bars and round horizontal bars for cost effective, maintenance free security. Delete if not required.

* 1. OMEGA II VERTICAL GRATING 10-20 FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Customized dimensions available upon request. Delete options not required.

* + 1. Height:
       1. 47.01 inches (1194 mm).
       2. 78.19 inches (1986 mm).
       3. 98.98 inches (2514 mm).
       4. Multiple stacked panels.
    2. Louver Panel Width: 64.65 inches (1642 mm).
    3. Bar Spacing:

\*\* NOTE TO SPECIFIER \*\*Difference between OMEGA10 and OMEGA20 is the horizontal bar spacing.

* + - 1. OMEGA 10: 5.197 inches (132 mm).
      2. OMEGA 20: 2.60 inches (66 mm).
    1. Vertical Grating Self-Supporting Steel Mesh Fence Panels:
       1. Fabricated of 6 gauge, 0.192 inch (4.88 mm) diameter steel horizontal bars welded to steel vertical plates.
       2. Steel Wires: 6 gauge, cold-rolled, annealed to AISI 1018 and ASTM A853-04.
       3. Plates: Heat-formed 1 inch (25 mm) wide plates to ASTM A505.
       4. Plate Thickness: 0.08 inch (2.0 mm).

\*\* NOTE TO SPECIFIER \*\*Select OMEGA10 or OMEGA20 is the horizontal bar spacing.

* + - 1. OMEGA 10: Bars and wires are resistance welded to create 2.44 x 5.20 inch (62 x 132 mm) rectangles.
      2. OMEGA 20: Bars and wires are resistance welded to create 2.44 x 2.60 inch (62 x 66 mm) rectangles.
      3. Steel Bars Tensile Strength: 75000 psi (515 MPa)
      4. Steel Bars Breaking Load: 2,166 lb (982.4 kg) per bar.
      5. Frame: 2 heat-formed horizontal plates 1 inch (25 mm) wide and 0.16 inch (4.0 mm) thick to AISI 1008 and ASTM A505.
      6. Frame ends are folded at 90 degrees for securing to posts.
      7. Folds are 2.56 inch (65 mm) longer than the vertical plates of the fence panel.

12.Panel longitudinal curvature shall not exceed 1/200 of frame length.   
13.Transverse curvature shall be less than or equal to 0.394 inch per 39.37 inches (10 mm per 1 m) of panel.

* + - 1. The difference between the panel width at the top and the width at the bottom shall be less than 0.25 inch (6.4 mm).
      2. Panel diagonals shall not present a difference of more than 0.25 inch per 59.05 inches (6.4 mm per 1.5 m) panel length.

\*\* NOTE TO SPECIFIER \*\*Select square or flat posts. Delete options not required.

* + 1. Square Posts: For installation in the ground or on base plates to meet the following horizontal loading requirements. Secured to posts with 3/8 x 3-1/2 inch (9.5 x 89 mm) galvanized carriage bolts and 3/8 inch (9.5 mm) galvanized nuts.
       1. 2 x 2 inches (50 x 50 mm) 11 gauge (3.0mm) posts:
          1. 50 inches (1290 mm) Posts: 502.8 pounds (2442 N).
          2. 82 inches (2082 mm) Posts: 339.3 pounds (1513 N).
          3. 102 inches (2610 mm) Posts: 270.7 pounds (1207 N).
       2. 3 x 3 inches (75 x 75 mm) 11 gauge (3.0mm) posts:
          1. 50 inches (1290 mm) Posts: 1309.7 pounds (5840 N).
          2. 82 inches (2082 mm) Posts: 811.3 pounds (3618 N).
          3. 102 inches (2610 mm) Posts: 647.2 pounds (2886 N).
    2. Flat Posts: For installation in the ground or on base plates to meet the following horizontal loading requirements. Secured to the posts at top of frame and bottom of frame using 3/8 x 1-1/2 inch (9.5 x 38 mm) galvanized carriage bolts and 3/8 inch (9.5 mm) galvanized nuts.
       1. 2.36 x 1/4 inch (60 x 6.35 mm) Posts:
          1. 50 inches (1274 mm): 241.5 pounds (1077 N).
          2. 81 inches (2066 mm): 148.9 pounds (664 N).
          3. 102 inches (2594 mm): 118.6 pounds (529 N).
       2. 3.15 x 1/4 inch (80 x 6.35 mm) Posts:
          1. 50 inches (1274 mm): 429.2 pounds (1077 N).
          2. 81 inches (2066 mm): 264.6 pounds (1180 N).
          3. 102 inches (2594 mm): 210.8 pounds (940 N).

\*\* NOTE TO SPECIFIER \*\* 4 attachment points are necessary for 47.01 in. (1194 mm) high panels. Larger dimension panels require 6 attachment points. Support brackets contribute to an increased rigidity in the center of the panel. Delete option not required.

* + 1. Number of parts required to secure panels on posts:

\*\* NOTE TO SPECIFIER \*\*Select for 47.01 inch (1194 mm) high panel height. Delete if not required.

* + - 1. Provide 4 bolts, 4 nuts, support brackets not required.

\*\* NOTE TO SPECIFIER \*\*Select for 78.19 inch (1986 mm) high panel height. Delete if not required.

* + - 1. Provide 6 bolts, 6 nuts, and 2 support brackets.

\*\* NOTE TO SPECIFIER \*\*Select for 98.98 inch (2514 mm) high panel height. Delete if not required.

* + - 1. Provide 6 bolts, 6 nuts, and 2 support brackets.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. OMEGA II VERTICAL GRATING 80-100 FENCES

\*\* NOTE TO SPECIFIER \*\*Select height. Customized dimensions available upon request. Delete options not required.

* + 1. Height:
       1. 77.28 inches (1963 mm).
       2. Multiple stacked panels.
    2. Width: 78.43 inches (1992 mm).
    3. Horizontal Louver Profile:

\*\* NOTE TO SPECIFIER \*\*Delete type not required.

* + - 1. OMEGA 80.
      2. OMEGA 100.
    1. Vertical Grating Self-Supporting Steel Mesh Fence Panels:
       1. Fabricated of 0.08 inch (2 mm) thick horizontal louvers welded to two vertical plates at the ends. Heat-formed complying with AISI 1008 and ASTM A 505.
       2. Vertical Plates: 0.12 inch (3 mm) thick and 2 inches (50 mm) wide. Heat-formed complying with AISI 1008 and ASTM A 505.
       3. Vertical Wires: 0.16 inch (4.06 mm) AISI 1018 steel in accordance with ASTM A 653 resistance-welded to louvers.
       4. Rectangle Size: 5.20 inch by 1.80 inch (132 mm by 45.77 mm).
       5. Cold Rolled Steel Bars: Tensile strength 75,000 psi (515 MPa) and breaking load 1499 lb (680.0 kg) per bar.
       6. Panel longitudinal curvature shall not exceed 1/200 of the frame length.
       7. Transverse curvature shall be less than or equal to 0.394 in. per 39.37 in. (10 mm per 1 m) of panel length.
       8. The difference between the panel width at the top and the width at the bottom shall be less than 0.25 in. (6.4 mm).
       9. Panel diagonals shall not present a difference of more than 0.25 in. (6.4 mm) in length. Difference between c/c distances of horizontal bars shall not be more than 0.25 in. per 59.05 in. (6.4 mm per 1.5 m) of panel length.

\*\* NOTE TO SPECIFIER \*\*Select square or flat posts. Delete options not required.

* + 1. Square Posts: For installation in the ground or on base plates to meet the following horizontal loading requirements. ). Fabricated of 16 gauge or 11 gauge pre-galvanized steel; cold-formed AISI 1008 steel in compliance with ASTM A500 Grade C and ASTM A787.
       1. 2 x 2 inches (50 x 50 mm) 11 gauge (3.0mm) posts:
          1. Model 80 - 79.05 (2008 mm), 351.8 pounds (1569 N).
          2. Model 100 - 79.53 (2020 mm), 349.8 pounds (1560 N).
       2. 3 x 3 inches (75 x 75 mm) 11 gauge (3.0mm) posts:
          1. Model 80 - 79.05 (2008 mm), 841.4 pounds (3752 N).
          2. Model 100 - 79.53 (2020 mm), 836.3 pounds (3729 N).
    2. Flat Posts: For installation in the ground or on base plates to meet the following horizontal loading requirements. Standard Flat Post thickness is 0.25 in. (6.35 mm). Hot-dip galvanized in accordance with ASTM A123 G100.
       1. 2.36 x 1/4 inch (60 x 6.35 mm) Posts:
          1. Model 80 - 78.42 inch (1992 mm), 154.5 pounds (689 N).
          2. Model 100 - 78.90 inch (2004 mm), 153.4 pounds (684 N).
       2. 3.15 x 1/4 inch (80 x 6.35 mm) Posts:
          1. Model 80 - 78.42 inch (1992 mm), 275.5 pounds (1224 N).
          2. Model 100 - 78.90 inch (2004 mm), 272.9 pounds (1217 N).
    3. Panels: Secured to the posts with vertical plates. Galvanized 3/8 inch diameter X 1-1/2 inch (9.5 mm x 38 mm) carriage bolts and galvanized 3/8 inch diameter (9.5 mm) nuts are required to secure panels to flat posts. For 2 inch square posts, install posts using galvanized 3/8 inch diameter x 3-1/2 inch (9.5 mm x 89 mm) carriage bolts and galvanized 3/8 inch diameter (9.5 mm) nuts. Four attachment points are required.
    4. Square Post Caps: Aluminum, 2 inch. x 2 inch (50 mm x 50 mm) or 3 inch x 3 inch (76 mm x 76 mm) depending on chosen post model. Galvanized steel, 4 inch x 4 inch (102 mm x 102 mm) or larger posts.
    5. Extensions: If applicable, 45 degree extensions on 2 inch (50 mm) and on 3 inch (76 mm) square posts, as well as on 2.36 in. x 1/4 inch (60 mm x 6.35 mm) and on 3.15 in. x 1/4 inch. (80 mm x 6.35 mm) flat posts. The extension length shall be a minimum of 18 inches (460 mm) and shall be welded at the end of the square post at a 45 degree angle. A minimum fence height of 6 feet (1829 mm) is required to be able to use these extensions.
    6. Straight or V-shaped Caps: 14.5 inch (368 mm) long at a 45 degree angle, with provisions to attach 3 rows of barbed wire at 4 inch (100 mm) intervals, shall be solidly secured to the posts with self-tapping screws which can withstand a 250 lb (113 kg) load.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required. Custom sizes are available. Contact the manufacturer for more detailed information.

* 1. OMEGA UNIK FENCE AND ACCESSORlES
     1. Panel Nominal Dimensions:

\*\* NOTE TO SPECIFIER \*\*Select nominal panel height. Customized dimensions available upon request.

* + - 1. Vertical Panels (HxW): 6 x 4 ft: 67-3/4 x 44 inches (1721 x 1118 mm).
      2. Vertical Panels (HxW): 8 x 4 ft: 91-3/4 x 44 inches (2330 x 1118 mm).
      3. Vertical Panels (HxW): \_\_\_ x \_\_\_inches (\_\_\_ x \_\_\_ mm).
      4. Horizontal panels (HxW): 4 x 6 ft: 43-3/4 x 68 inches (1111 x 1727 mm).
      5. Horizontal panels (HxW): 4 x 8 ft: 43-3/4 x 92 inches (1111 x 2337 mm).
      6. Horizontal Panels (HxW): \_\_\_ x \_\_\_inches (\_\_\_ x \_\_\_ mm).
    1. Perforated Panels: Aluminum Sheet: 5052-H32; 1/8 inch (3.2 mm) thick.
       1. Folds: Typically made on all four sides of the panel, 2 inch (51 mm).
       2. Buffer: 1 inch (25 mm) reserved on the circumference of the panel (after folds) before the beginning of extruding the selected design.
       3. Stack two vertical panels to double the fence height.
       4. Panels are joined together with hexagonal screws and tamper-proof nuts.
       5. Rectangular holes of 1/2 x 3/8 inch (13 x 9.5 mm) are made on panel folded sides to attach itself to posts or other panels if needed,
    2. Square Posts: Cold-formed AISI 1008 steel to meet ASTM A500 and ASTM A787 and the following maximum horizontal loads, length as required for installation type:
       1. Post Length: Minimum 36 inches (914 mm) more than the actual height of fence for in-ground installation, depending on local land code requirements (frost line).

\*\* NOTE TO SPECIFIER \*\* Select installation type. Delete options not required.

* + - 1. Installation Type: In-ground, post length as required for local frost line requirements.
      2. Installation Type: Surface mounted, flanged.
      3. Installation: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\*Select Post Size. Delete option not required.

* + - 1. Post Size: 2 x 2 inch (51 x 51 mm) x 11 ga (0.12 inch or 3.0 mm).
      2. Post Size: 3 x 3 inch (76.2 x 76.2 mm) x 11 ga (0.12 inch or 3.0 mm).
    1. Flat Posts: Cold-rolled per ASTM A500 and ASTM A787. Hot-dip galvanized per ASTM A123 Grade 100.
       1. Flat Post Width: 2-1/2 inch (64 mm) x 1/4 inch (6.4 mm) thick. Theses flat posts are
       2. Post Length: Minimum 36 inches (914 mm) more than the actual height of fence for in-ground installation, depending on local land code requirements (frost line).

\*\* NOTE TO SPECIFIER \*\* Select installation type. Delete options not required.

* + - 1. Installation Type: In-ground, post length as required for local frost line requirements.
      2. Installation Type: Surface mounted, flanged.
      3. Installation: \_\_\_\_\_\_\_\_.
    1. Post Brackets: Standard bolt system for installation on flat posts with panels in straight line.
       1. Carriage Bolts and Tamper Proof Nuts: Stainless steel. 5/16 in (8 mm)

\*\* NOTE TO SPECIFIER \*\* For custom panel sizes, contact the Manufacturer for more detailed information..

* + - * 1. Vertical Panels: Bolts per Post: Three.
        2. Horizontal Panels: Bolts per Post: Two.
        3. Stacked Horizontal Panels: Bolts per Post: Two.2 bolts per post. Three additional bolts per set of stacked panels.
    1. Post Caps:

\*\* NOTE TO SPECIFIER \*\* Select type. Delete options not required.

* + - 1. For posts 2 x 2 inch (51 x 51 mm), 3 x 3 inch (76 x 76 mm) and 4 x 4 inch (102 x 102 mm): Aluminum alloy.
      2. For Larger Dimensions: Galvanized steel.
    1. Polyester Powder Coating: Polyester coating to be minimum 4 mils applied by an electrostatic process. Coating shall cover all surfaces of the wire and post sections. Coating shall be capable of withstanding the following tests:
       1. Mechanical adhesion test as per ASTM D3359 - Method B.
       2. Shock resistance tests as per ASTM D2794.
       3. Salt spray testing with a minimum of 1 000 hours without red rust appearance, as per ASTM B117.
       4. Humidity resistance in a weather meter chamber as per ASTM D2247.
       5. Exposure to ultraviolet light with exposure of 1 000 hours using apparatus Type E and 145 degrees F (63 degrees C) as per ASTM D1499.
    2. Concrete: Comply with ACI 301 f.
       1. Portland cement complying with ASTM C150 \_\_\_\_\_\_\_\_.
       2. Aggregates: Complying with ASTM C33.
       3. Potable Water for ready-mixed concrete complying with ASTM C94.
       4. Measure, batch, and mix Project-site-mixed concrete according to ASTM C94.
       5. NOTE TO SPECIFIER \*\* Select barbed wire finish and spacing. Delete if not required.
    3. Barbed Wire: double strand steel wire, 12 ga (2.6 mm), twisted line with 4-point barbs.
       1. Wire Finish: Zinc coated.
       2. Wire Finish: Aluminum coated.

\*\* NOTE TO SPECIFIER \*\* Delete barb spacing not required.

* + - 1. Barb Spacing: 3 inches (76 mm) conforming to ASTM A121.
      2. Barb Spacing: 5 inches (127 mm) conforming to ASTM A121.
      3. Supporting Arms: Pressed steel provisioned for attaching three rows of barbed wire. Arms are fastened to the posts. Arm Loading: 250 lbs (113 kg) downward pull at outermost end of arm without failure.
    1. "V"Shaped barbed wire supporting arms: Pressed steel arms at both sides, provisioned for six rows of barbed wire. Arms are fastened to the posts. Arm Loading: 250 lbs (113 kg) downward pull at outermost end of arm without failure.
    2. NOTE TO SPECIFIER \*\* Delete if overhang extension is not required. Larger dimensions are available on request.
    3. Overhang: 45 degree extension with same dimensions as the posts; 2 x 2 inches (51 x 51 mm) or 3 x 3 inch (76 x 76 mm) and a minimum length of 18 inches (457 mm).
       1. Weld at end of square post by forming an angle of 45 degrees and provided with two kits of fasteners to receive a panel of 16 inches (420 mm).
  1. SWING GATES
     1. Configuration:

\*\* NOTE TO SPECIFIER \*\* Select single, double, or as shown on the drawings if more than one type. Delete options not required.

* + - 1. Single swing.
      2. Double swing.
      3. Swing as shown on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Select 16 gauge for gates under 7 feet (2134 mm), 11 gage and supplementary support for gates over 7 feet. Delete option not required.

* + 1. Gate Frames: Two horizontal ASTM F900 galvanized square steel tubes, 16 gauge, 1-1/2 x 1-1/2 inch (38 mm X 38 mm), and two vertical tubes 2 x 2 inch (50 x 50 mm) welded at intersections to create a rigid frame.
    2. Gate Frames: Two horizontal ASTM F900 galvanized square steel tubes, 11 gauge, 1-1/2 x 1-1/2 inch (38 mm X 38 mm), two vertical tubes 2 x 2 inch (50 x 50 mm), and 1-1/2 x 1-1/2 inch (38 x 38 mm) supplementary vertical support, welded at intersections to create a rigid frame.
    3. Gate Posts: Cold rolled 1008 grade steel to meet ASTM 500 and ASTM A787, length as required for installation type:

\*\* NOTE TO SPECIFIER \*\*Select installation type. Delete option not required.

* + - 1. Installation: In ground, post length as required for local frost line requirements.
      2. Installation: Surface mounted, flanged.

\*\* NOTE TO SPECIFIER \*\*For fences under 6' (1830 mm) high. Delete options not required.

* + - 1. Post Size: 3 x 3 inch (75 x 75 mm).

\*\* NOTE TO SPECIFIER \*\*For fences between 6'-1" (1830 mm) and 13'6" (4115mm) high. Delete options not required.

* + - 1. Post Size: 4 x 4 inch (100 x 100 mm).

\*\* NOTE TO SPECIFIER \*\*For fences between 13'6" (4115mm) and 16' (4875mm) high. Delete options not required.

* + - 1. Post Size: 6 x 6 inch (150 x 150 mm).

\*\* NOTE TO SPECIFIER \*\*For fences over 16' (4875mm) high. Delete options not required.

* + - 1. Post Size: Custom engineering by the manufacturer.
    1. Gate Hardware: Hinges, Latches, Drop Rods: Hot-dipped galvanized steel to ASTM F900, sized to assure proper gate operation. Non-moving parts shall be powder-coated.
       1. Hinge: Structurally designed by manufacturer to support gates without deformation during opening and closing.
       2. Latch: Clamp-on, self-latching, gravity system.

\*\* NOTE TO SPECIFIER \*\*Keyed lock box is optional. Delete if not required.

* + - 1. Keyed Lock-Box: LOCINOX with single lever, one side of each gate as shown.
      2. Keyed Lock-Box: LOCINOX with double levers, both sides of gates.

\*\* NOTE TO SPECIFIER \*\*Include for double gates. Delete if not required.

* + - 1. Additional Hardware for Double Gates:
         1. Keeper: Mechanical device with gravity-lock system to fasten each gate leaf in full open position.
         2. Drop Bar: Secures one gate in closed position using stop pipe to engage the center drop rod.
         3. Self-Locking Device: Integral to latch, and with padlock eyes.
  1. CANTILEVER GATES
     1. Construction: 6063-T6 aluminum to ASTM B221, weighing 0.94 lb/ft (1.39 kg/m), fabricated in accordance with ASTM F1184, Class 2.
        1. Members are welded together to form rigid one-piece frames with integral top track.
        2. Provide 2 track and wheel assemblies for each gate leaf, comply with manufacturer instructions for gates larger than 30 feet (9144 mm).
        3. Vertical Uprights: 2 x 2 inch (50 x 50 mm) aluminum, welded to gate frames approximately 8 foot (2440 mm) apart, dividing the frame into equal sections.

\*\* NOTE TO SPECIFIER \*\*Include for gates over 27 feet (8230 mm) in single opening. Delete if not required

* + - 1. Gates over 27 feet (8230 mm): Shipped in 2 parts and field spliced with special attachments provided by manufacturer.
    1. Gate Leaf in Single Openings:

\*\* NOTE TO SPECIFIER \*\* Select for gates 6 ft. (1830 mm) to 10 ft. (3040 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 6.5 feet (1980 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 11 ft. (3350 mm) to 14 ft. (4270 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 7.5 feet (2290 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 15 ft. (4570 mm) to 22 ft (6710 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 10 feet (3040 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 23 ft. (7010 mm) to 30 ft. (9140 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 12 feet (3660 mm) with additional 2 inch (50 mm) square lateral support of aluminum weighing 1.71 lb/ft. (2.54 kg/m) welded to top horizontal rail, and with bottom rail 2 x 4 inches (50 x 100 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 31 ft. (9450 mm) to 35 ft (10670 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 13.5 feet (4120 mm) aluminum member weighing 1.71 lb/ft. (2.54 kg/m), with 2 top tracks welded together to form a dual enclosed track, with 2 truck assemblies for each track in each gate leaf, for a total of 4 truck assemblies. Bottom rail 2 x 4 inches (50 x 100 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 36 ft. (10970 mm) to 40 ft. (12190 mm). Delete if not required.

* + - 1. Cantilever Support (Overhang): 16 feet (4880 mm) aluminum member weighing 1.71 lb/ft. (2.54 kg/m), with 2 top tracks welded together to form a dual enclosed track, with 2 truck assemblies for each track in each gate leaf, for a total of 4 truck assemblies. Bottom rail 2 x 4 inches (50 x 100 mm).

\*\* NOTE TO SPECIFIER \*\* Select for gates 41 ft. (12500 mm) to 50 ft. (15240 mm). Typically fabricated of 24 inch (610 mm) wide rigid box frame truss of dual side frames, separated by square cross members and diagonal truss rod bridging. Dual side frames each contain top track to provide support for truss from both sides. Provide 4 trucks for each track, total 8 for each gate leaf. Weld steel plate between top of support posts to maintain truck assemblies in alignment with tracks. Delete if not required.

* + - 1. Cantilever Support (Overhang): Custom by manufacturer.
      2. As Shown on the Drawings.
    1. Sliding Components:
       1. Bracing: Diagonal adjustable length truss rods of 3/8 inch (9.5mm) galvanized steel, in each panel of gate frames.
       2. Top Track: Enclosed, combination one-piece track and rail of aluminum extrusion weighing 3.72 lb/ft (5.54 kg/m), able to withstand reaction load of 2000 lb (907 kg). Track does not receive polymer coating.
       3. Truck Assembly: Swivel type, zinc die cast, with 4 sealed lubricant ball bearing rollers, 2 inches (50 mm) in diameter by 9/16 inch (14 mm) in width, and 2 side rolling wheels to ensure truck alignment in track. Mounted on post brackets using 7/8 inch (22 mm) diameter ball bolts with 1/2 inch (13 mm) shank. Design truck assembly to withstand same reaction load as track assembly.
       4. Gate Hangers, Latches, Brackets, Guide Assemblies, and Stops: Malleable iron or steel, galvanized after fabrication. Provide positive latch for padlocking. Fittings do not receive Polymer coating.
       5. Bottom Guide Wheel Assemblies: Two 4 inch (100 mm) diameter rubber wheels, straddling bottom horizontal gate rail, to allow adjustments to maintain gate frame plumb and in proper alignment. One assembly attached to each guide post. Bottom guide wheel assemblies do not receive polymer coating.
    2. Gate Posts: Square sections of 4 inch (100mm) hot-dipped galvanized steel to ASTM A500, Grade B with a minimum yield strength of 40,000 psi (275 MPa), weighing 7.04 lb/ft (10.8 kg/m), and with minimum 1.8 oz/sq.ft. (549 g/m2) zinc coating to ASTM F1234. Length of gate posts minimum 36 inches (914mm) more than the actual height of the fence for installation in the ground to meet local frost line requirements.

\*\* NOTE TO SPECIFIER \*\*Select single or double slide gates. Delete option not required.

* + - 1. Single Slide Gate: 1 latch post and 2 support posts.
      2. Double Slide Gates: 1 latch post and 4 support posts for double slide gates.

\*\* NOTE TO SPECIFIER \*\* Delete gate operators if not required.

* 1. GATE OPERATORS
     1. System Description: Factory-assembled automatic gate operation system comprised of UL approved components, designed for gate size, type, weight, construction, use, traffic-flow patterns, and operation frequency. Provide with minimum two keys per lock and the following:
        1. Operator System: of size, capacity, and with features, characteristics, and accessories suitable for Project conditions, as recommended and provided by gate manufacturer. Complete with electric motor and factory-prewired motor controls, remote-control stations, control devices, power disconnect switch, obstruction detection device, and wiring from motor controls to motor.
        2. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
        3. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, NEMA ICS 6, and NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.
        4. Electrohydraulic Operation: Provide unit designed for mounting as shown on the drawings; consisting of electric motor, pump, hydraulic actuator to suit gate type, valves.

\*\* NOTE TO SPECIFIER \*\* Provide in cold climates. Delete if not required.

* + - * 1. Provide heater to maintain constant temperature, and cold-weather hydraulic fluid; with hydraulic locking in both directions.
      1. Enclosure: Lockable weatherproof enclosures to protect controls, operating parts, and accessories. Include corrosion-resistant factory finish to match gates.
      2. Operator shall allow motor to be removed without disturbing limit-switch adjustment and without affecting auxiliary emergency operator.
      3. Units are designed and wired for both right-hand and left-hand opening, permitting universal installation.

\*\* NOTE TO SPECIFIER \*\* Select Electromechanical or Electrohydraulic operation as recommended by the manufacturer. Delete option not required.

* + 1. Electrohydraulic Operation: Provide unit designed for mounting as shown on the drawings; consisting of electric motor, pump, hydraulic actuator to suit gate type, valves.

\*\* NOTE TO SPECIFIER \*\* Provide in cold climates. Delete if not required.

* + - 1. Provide heater to maintain constant temperature, and cold-weather hydraulic fluid; with hydraulic locking in both directions.
    1. Electromechanical Operation: Provide unit designed for mounting as shown on the drawings; consisting of electric motor and factory-prewired motor controls, starter, speed control device, chain-drive assembly, brake, clutch or torque limiter, and as follows:

\*\* NOTE TO SPECIFIER \*\* Select one of the following based on manufacturer recommendations. Delete options not required.

* + - 1. Enclosed worm gear reducer, roller chain drive.
      2. Enclosed worm gear and chain and sprocket reducers, roller chain drive.
      3. V-belt and worm gear reducers, roller chain drive.
      4. V-belt and chain and sprocket reducers, roller chain drive.
      5. Enclosed worm gear reducer, wheel and rail drive.
    1. Operation Cycle Requirements: Design gate operator to operate for not less than the following duty and cycles per hour. One cycle equals one gate opening plus one gate closing.

\*\* NOTE TO SPECIFIER \*\* Select based on Owners project requirements. Delete options not required.

* + - 1. Medium Duty: 10 cycles per hour.
      2. Heavy Duty: 25 cycles per hour.
      3. Peak Duty: 20 cycles per hour at peak periods.
      4. Custom: \_\_\_ cycles per hour.
      5. Custom: \_\_\_ cycles per day.
    1. Gate Operation Speed:

\*\* NOTE TO SPECIFIER \*\* Select based on Owners project requirements. Delete options not required.

* + - 1. Minimum 45 fpm (0.229 m/s).
      2. Minimum 60 fpm (0.305 m/s).
      3. Minimum \_\_\_ fpm (\_\_\_ m/s).
    1. Electric Motors: High-starting torque, continuous-duty, insulated electric motors, complying with NEMA MG 1, sized to start and operate size and weight of gate considering Project's service conditions without exceeding nameplate ratings or considering service factor.

\*\* NOTE TO SPECIFIER \*\* Select reversible or single direction. Delete option not required.

* + - 1. Direction: Reversible.
      2. Direction: Single-direction.
      3. Service Factor: According to NEMA MG 1, unless otherwise indicated.
      4. Enclosure: Totally enclosed, non-ventilated or fan-cooled motors, fitted with plugged drain, unless otherwise indicated.

\*\* NOTE TO SPECIFIER \*\* Select manual or automatic thermal protection. Delete option not required.

* + - 1. Thermal Protection: Internal manual reset.
      2. Thermal Protection: Internal automatic reset.

\*\* NOTE TO SPECIFIER \*\* Select motor phase and power requirements. Delete option not required.

* + - 1. Motors Smaller Than 1/2 hp: Single phase, 60 Hz.
      2. Motors Smaller Than 1/2 hp: Polyphase, 60 Hz.
      3. Motors 1/2 hp and Larger: Polyphase, \_\_\_ voltage rating, 60 Hz.
      4. Motor horsepower as recommended by operator manufacturer.
      5. Motor horsepower as indicated on Drawings.
      6. Motor horsepower: \_\_\_\_\_\_.
    1. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions.
    2. Emergency Release Mechanism: Quick disconnect release of operator drive system of the following type of mechanism, permitting manual operation if operator fails. Design system so control circuit power is disconnected during manual operation.

\*\* NOTE TO SPECIFIER \*\*Select type. Delete option not required.

* + - 1. Integral fail-safe release, allowing gate to be pushed open without mechanical devices, keys, cranks, or special knowledge.
      2. Mechanical device, key, or crank-activated release.
    1. Operating Features: Include the following:
       1. Digital Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features.
          1. Provide unit that is isolated from voltage spikes and surges.

\*\* NOTE TO SPECIFIER \*\* Delete option if not required.

* + - * 1. Provide unit capable of monitoring and auditing gate activity.
      1. Fully Systems Compatible: With controlling circuit board capable of accepting any type of input from external devices.
      2. Master/Slave Capability: Control stations designed and wired for gate pair operation.
      3. Automatic Closing Timer: With adjustable time delay before closing.

\* NOTE TO SPECIFIER \*\* Delete option if not required.

* + - * 1. Provide unit with timer cut-off switch.
      1. Open Override Circuit: Designed to override closing commands.
      2. Reversal Time Delay: Designed to protect gate system from shock load on reversal in both directions.
      3. Maximum Run Timer: Designed to prevent damage to gate system by shutting down system if normal time to open gate is exceeded.

\* NOTE TO SPECIFIER \*\* Select Clock Timer period. Delete option not required.

* + - 1. Clock Timer: 24-hour, programmable for regular events.
      2. Clock Timer: Seven-day, programmable for regular events.
  1. REMOTE CONTROLS
     1. Electric controls separated from gate and motor and drive mechanism, with NEMA ICS 6, Type 1, NEMA ICS 6, Type 4, or other type of enclosure approved by the local jurisdiction, for mounting as shown on the drawings, and with space for additional optional equipment.:

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all if keyed control stations are not used.

* + 1. Keyed Control Station:
       1. Two-position, switch-operated control station located remotely from gate, with on and off functions. Minimum two-keys per station.
       2. Three-position, switch-operated control station with open and close functions and spring return to off position. Minimum two-keys per station.
       3. Three-position, switch-operated control station with open and close functions and spring return to off position with stop button. Minimum two-keys per station.

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all if momentary-contact control stations are not used.

* + 1. Momentary-Contact Control Station:
       1. Single-button-operated control station with open and close functions.
       2. Three-button-operated control station with open, close, and stop positions.
       3. Three-button-operated control station with open, close, and stop positions, and with key switch to lock out open and close buttons. Minimum two-keys per station.

\*\* NOTE TO SPECIFIER \*\* Delete below if card readers are not used.

* + 1. Card Readers: Functions only when authorized card is presented. Provide insertion-reader-type, face-lighted unit fully visible at night and the following:

\*\* NOTE TO SPECIFIER \*\* Select card reader coding options. Delete options not required.

* + - 1. Magnetically coded, single-code system activated by coded card.
      2. Magnetically coded, single-code system activated by coded card and permitting four different access time periods.
      3. Programmable, multiple-code capability permitting validating or voiding of individual cards.
      4. Programmable, multiple-code capability permitting validating or voiding of individual cards and permitting four different access time periods.

\*\* NOTE TO SPECIFIER \*\* Select card reader type. Delete options not required.

* + - 1. Reader Type:
         1. Touch plate.
         2. Swipe.
         3. Insertion.
         4. Proximity.

\*\* NOTE TO SPECIFIER \*\* Delete card reader features that are not required.

* + - 1. Timed anti-passback.
      2. Limited time usage.
      3. Capable of monitoring and auditing gate activity.

\*\* NOTE TO SPECIFIER \*\* Delete below if digital keypads are not used. Delete options not required.

* + 1. Digital Keypad Entry Unit: Functions only when authorized code is entered.
       1. Multiple-code capability of not less than 5 possible individual codes.
       2. Multiple-code capability of not less than 100 possible individual codes.
       3. Multiple-code capability of not less than 500 possible individual codes.
       4. Multiple-code capability of not less than 2,500 possible individual codes.
       5. Multiple-code capability of not less than 10,000 possible individual codes.
       6. Multiple-code capability as indicated.
       7. Programmable using 1 to 6 digits.
       8. Programmable using 1 to 6 digits and permitting up to four different access time periods.
       9. Face-lighted unit with metal-keyed keypad fully visible at night
       10. Face-lighted unit with keyless-membrane keypad fully visible at night.

\*\* NOTE TO SPECIFIER \*\* Delete digital keypad features that are not required.

* + - 1. Timed anti-passback.
      2. Limited time usage.
      3. Capable of monitoring and auditing gate activity.

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all below if radio control stations are not used.

* + 1. Radio Control: Digital system consisting of code-compatible universal coaxial receiver, remote antenna with coaxial cable and mounting brackets, including:

\*\* NOTE TO SPECIFIER \*\* Select location. Delete options not used.

* + - 1. Provide one radio control per gate.
      2. Provide radio controls where indicated on Drawings.
      3. Provide one permanently mounted transmitter per receiver.
      4. Provide four portable transmitters per receiver.
      5. Provide number of transmitters as recommended by the manufacturer for each condition.
      6. Provide programmable transmitter with multiple-code capability permitting validating or voiding of not less than the following codes per channel:
         1. 1000 codes per channel.
         2. 10,000 codes per channel.
      7. Button Transmitters:
         1. Single-button-operated control station with open and close functions.
         2. Three-button-operated control station with open, close, and stop positions.
         3. Three-button-operated control station with open, close, and stop positions, and with key switch to lock out open and close buttons. Minimum two-keys per station.
         4. Provide independent channels and settings to control various receiver and gate combinations as indicated.

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all below if telephone entry systems are not used.

* + 1. Telephone Entry System: Hands-free voice-communication system for connection to building telephone system with digital-entry code activation of gate operator, including:
       1. Auxiliary keypad entry.
       2. Residential System: Designed to be wired to same line with telephone.
       3. Multiunit System: Designed to be wired to a dedicated telephone line, and the following:
          1. Capacity to access 20 telephones
          2. Capacity to access 100 telephones
          3. Include electronic directory.

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all below if vehicle loop detector systems are not used.

* + 1. Vehicle Loop Detector System: Automatic closing timer with adjustable time delay before closing, electronic loop detector with detection patterns adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit a signal activating the gate operator. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location shown on Drawings, as recommended in writing by detection system manufacturer for function indicated. Provide with the following:
       1. Timer cut-off switch.
       2. Operation:
          1. Designed to open and close gate.
          2. Designed hold gate open until traffic clears.
          3. Designed to reverse gate.
       3. Loop:
          1. Wire in size indicated for field assembly, and sealant.
          2. Factory preformed in size indicated.
          3. Installation Style:
          4. Pave-over.
          5. Saw-cut.

\*\* NOTE TO SPECIFIER \*\* Select options. Delete all below if vehicle presence detectors are not used.

* + 1. Vehicle Presence Detector: System with automatic closing timer and adjustable time delay before closing and presence detector, adjustable detection pattern and sensitivity zones, designed to detect the presence or transit of a vehicle in gate pathway by interrupting an infrared beam in zone pattern to emit a signal activating the gate operator, and the following:
       1. Timer cut-off switch.
       2. Operation:
          1. Designed to open and close gate.
          2. Designed hold gate open until traffic clears.
          3. Designed to reverse gate.
       3. Detector Type:
          1. Retroreflective
          2. Emitter/receiver.

NOTE TO SPECIFIER \*\* Select options. Delete all below if obstruction detectors are not used.

* + 1. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensors that cause operator to immediately function as follows:

NOTE TO SPECIFIER \*\* Select action. Delete option not required.

* + - 1. Action: Reverse gate in both opening and closing cycles and hold until clear of obstruction.
      2. Action: Stop gate in opening cycle and reverse gate in closing cycle and hold until clear of obstruction.

NOTE TO SPECIFIER \*\* Select sensor type and all options. Delete options not required.

* + - 1. Internal Sensor: Built-in torque or current monitor senses gate is obstructed.
      2. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connected to control circuit using the following:
         1. Take-up cable reel.
         2. Self-coiling cable.
         3. Gate edge transmitter and operator receiver system.
         4. Sensor edge location:

Along entire gate leaf leading edge.

Along entire gate leaf trailing edge.

Across entire gate leaf bottom edge.

Along entire length of gate posts.

Along entire length of gate guide posts.

Where indicated on Drawings.

* + - 1. Photoelectric/Infrared Sensor System: Designed to detect an obstruction in partition's path by interruption of an infrared beam in the zone pattern without obstruction contacting gate.
  1. ACCESSORlES

\* NOTE TO SPECIFIER \*\* Select accessories to be provided. Delete accessories not required.

* + 1. Concrete Footing Mixture for In-Ground Installations: Unless otherwise specified in Division 03 Concrete, provide the following:
       1. Normal-weight concrete with not less than 3000 psi (20.7- Mpa) compressive strength (28 days);
       2. 3 inch (75-mm) slump and containing coarse aggregate of minimum diameter of 0.2 inches (5 mm) to maximum of 3/4 inch (20 mm);
       3. 5% to 7% air entrainment.
    2. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
    3. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and recommended in writing by manufacturer for exterior applications.

\*\* NOTE TO SPECIFIER \*\* Delete if barbed wire is not required.

* + 1. Barbed Wire:
       1. Supporting Arms: Pressed steel arms attached to post support 3 rows of barbed wire. Arms withstand 250 lb. (113 kg) downward pull at outermost end of arm without failure.

\*\* NOTE TO SPECIFIER Select barbed wire spacing. Delete option not required.

* + - 1. Barbed Wire: Zinc or aluminum coated steel wire to ASTM A121, double strand, 12 gauge, twisted line wire with 4 point barbs, spaced approximately 3 inches (75 mm) on center.
      2. Barbed Wire: Zinc or aluminum coated steel wire to ASTM A121, double strand, 12 gauge, twisted line wire with 4 point barbs, spaced approximately 5 inches (125 mm) on center.
    1. Mounting kit including pedestal.
    2. Audio Warning Module: ADA-compliant audible alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving.
    3. Visual Warning Module: ADA-compliant visible alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving.

\* NOTE TO SPECIFIER \*\* Select alarm light type. Delete option not required.

* + - 1. Alarm Light Type: Constant.
      2. Alarm Light Type: Strobe.
    1. Battery Backup System: Battery-powered drive and access control system, independent of primary drive system, opening gate if power fails.
    2. External electric-powered lock with delay timer allowing time for lock to release before gate operates. Provide with:

\* NOTE TO SPECIFIER \*\* Select types. Delete option not required.

* + - 1. Solenoid for swing gate.
      2. Magnetic for swing gate.
      3. Solenoid for slide gate.
      4. Magnetic for slide gate.
    1. Fire box in accordance with local jurisdiction's requirements.
    2. Postal box in accordance with local jurisdiction's requirements.
    3. Fire strobe sensor.
    4. Fire siren sensor.
    5. Intercom system.
    6. Instructional, Safety, and Warning Labels and Signs:

\* NOTE TO SPECIFIER \*\* Select warning sign types. Delete options not required.

* + - 1. According to UL 325.
      2. Manufacturer's standard for components and features specified.
      3. As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Evolution is manufactured with a galvanized finish. Elite and Secur are galvanized and then receive a polyester-coated finish. Delete if not required.

* 1. FlNlSHES
     1. Zinc Coating:
        1. Wire Mesh Coating: 0.5 oz./sq.ft. (150 g/m2) zinc in conformity with ASTM A 641 (1989) Class 1.
        2. Fence Posts and Gate Frames Coating: Zinc coated (galvalume process) with a minimum of 0.9 oz/sq.ft. (275 g/m2) as per ASTM A653 G90.
     2. Polyester Coating: Polyester coating to be minimum 4 mils applied by an electrostatic method to cover all surfaces of the wire mesh and post sections. Coating shall be capable of withstanding requirements of the following tests:
        1. Mechanical Adhesion: ASTMD 3359 - Method B.
        2. Shock Resistance: ASTM D 2794.
        3. Salt Spray Testing: Minimum of 1,000 hours without red rust appearance, per ASTM B 117 (1990).
        4. Humidity Resistance: ASTM D 2247, weather meter chamber.
        5. Exposure to Ultraviolet Light: ASTM D1499, exposure of 1000 hours using apparatus Type E and 63 degreesC.
     3. Polyester Surface Coating Colors:

\*\* NOTE TO SPECIFIER \*\*Select standard black or optional color coating. Delete options not required.

* + - 1. Standard Coating: Black, RAL 9004.
      2. Gloss Coating: Signal white, RAL 9003.
      3. Gloss Coating: Silver grey, RAL 7001.
      4. Gloss Coating: Basalt grey, RAL 7012.
      5. Gloss Coating: Fir green, RAL 6009.
      6. Gloss Coating: Chocolate brown, RAL 8017.
      7. Gloss Coating: Signal red, RAL 3001.
      8. Textured Coating: Signal yellow, RAL 1003.
      9. Textured Coating: Taupe brown.
      10. Textured Coating: Sapphire blue, RAL 5003.
      11. Metallic Coating: Silver.
      12. Metallic Coating: Silver vein.
      13. Metallic Coating: Copper vein.
      14. Custom Coating: [\_\_\_\_\_\_\_] [Match RAL \_\_\_\_\_].

1. EXECUTION
   1. EXAMINATION
      1. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.
         1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.

\*\* NOTE TO SPECIFIER \*\*Include survey only if required. Delete if not required.

* + - 1. Provide a verified survey of property lines and legal boundaries.
    1. Proceed with installation only after unsatisfactory conditions have been corrected.
  1. PREPARATION
     1. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes.
     2. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments marked by registered surveyor and utility companies.
  2. FENCE POST LAYOUT
     1. Layout fencing on established boundaries inside property line.
     2. Terminal Posts Layout: Locate terminal end, corner, and gate posts at changes in horizontal or vertical alignment of:

\*\* NOTE TO SPECIFIER \*\*Delete requirements not required.

* + - 1. 15 degrees or more.
      2. 30 degrees or more.
      3. As indicated on Drawings.
      4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\* NOTE TO SPECIFIER \*\*Select 2 or 3 inch posts. Delete option not required.

* + 1. Post spacing for 2 inch (50 mm) posts:
       1. Architectural panel 97-3/4 inch (2483 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       2. Elite & Secur panel 103-7/8 inch (2638 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       3. ECO Architectural panel 95-9/16 inch (2427 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       4. OMEGA 10-20 panels fence 80-3/4 inch (2051 mm) center to center with a adjustment of plus or minus 5/16 in. (8 mm).
       5. OMEGA 80-100 panels 67 inch (1701 mm) center to center with an adjustment of plus or minus 5/16 in. (8 mm).
    2. Post spacing for 3 inch (75 mm) posts:
       1. Architectural panel 98-3/4 inch (2508 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       2. Elite & Secur panel 104-7/8 inch (2664 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       3. ECO Architectural panel 95-9/16 inch (2427 mm) center to center with an adjustment of plus or minus 1-1/2 in. (38 mm).
       4. OMEGA 10-20 panels fence 81-3/4 inch (2076 mm) center to center with a adjustment of plus or minus 5/16 in. (8 mm).
       5. OMEGA 80-100 panels 68 inch (1726 mm) center to center with an adjustment of plus or minus 5/16 in. (8 mm).

\*\* NOTE TO SPECIFIER \*\*Select for 4 and 6 foot high panels. Delete if not required.

* + 1. For Evolution panel installation; Space line posts equal distant 10 feet (3050 mm) maximum center to center.

\*\* NOTE TO SPECIFIER \*\*Select for 8 foot high panels. Delete if not required.

* + 1. For Evolution panel installation; Space line posts equal distance 8 feet (2430 mm) maximum center to center.
    2. Sloped Fences:
       1. Step fence sections in accordance with the manufacturer's instructions.
       2. Unless otherwise shown on the drawings, align a new post at each step for a clean line.
       3. Slide universal brackets on posts to desired height, always installing flush with horizontal wire (no gap).
       4. For steep slopes, provide longer posts and panels cut in half or panels in special shapes to keep gaps under panels to a minimum.
  1. IN-GROUND CONCRETE INSTALLATION
     1. Drill or hand-excavate holes for posts to spacing indicated, in firm, undisturbed or compacted soil.
     2. Dig holes with a diameter 4 times the diameter of the post and 6 inches (150 mm) deeper than the bottom of the post.
        1. Minimum 8 inch (200 mm) in diameter and 42 inch (1070 mm) in depth.
     3. Concrete forms are not necessary or recommended. Crown concrete at top to shed water.
     4. Measure, batch, and mix project-site-mixed concrete according to ASTM C 94. Pour concrete and let cure in accordance with ACI 301 and Division 03 Section "Cast-in-Place Concrete".

\*\* NOTE TO SPECIFIER \*\*Select exposed or concealed footings. Delete type not required.

* + 1. Exposed Concrete Footings: Extend concrete 2 inches (50 mm) above grade, or as indicated on Drawings, smooth, and shape to shed water.
    2. Concealed Concrete Footings: Stop footings 2 inches (50 mm) below grade or as indicated on Drawings to allow covering with surface material.
    3. Post Setting: Set posts in concrete footing. Protect portion of posts above ground from concrete splatter. Place concrete around posts and consolidation. Using mechanical devices to set posts is not permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

\*\* NOTE TO SPECIFIER \*\*Delete setting type not required.

* + 1. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, non-metallic grout, or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
    2. Posts Set into Concrete in Voids: Form or core drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than outside diameter of post. Clean holes of loose material, insert posts, and fill granular space between post and concrete with non-shrink, non-metallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

\*\* NOTE TO SPECIFIER \*\* Delete if surface mounted flange installation is not required.

* 1. SURFACE MOUNTED FLANGE INSTALLATION
     1. Flange Post Installation: Bolt mounting plates attached to each post to slab or structure as indicated, using expansion bolts in accordance with the manufacturer's instructions.
  2. PANEL INSTALLATION
     1. Once the post installation is complete, install the mesh sections with the Universal Bracket kits, flush with horizontal wire of the panel (no gap).
     2. Attach the panels to the posts with eye-U-bracket and tie wire or twist tie. Where two panels meet and no post is set, join them with end-to-end connectors used for panel to panel linkage. Do not exceed manufacturers recommended spacing. Attach panel to corner posts with bands spaced maximum of 24 inches (2610 mm) on center.
     3. Panel Installation: Installed a minimum of 1-1/4 inch (30 mm) and maximum of 2 inches (50 mm) above the ground surface.

\*\* NOTE TO SPECIFIER \*\*Select security or safety as required. Delete option not required.

* + - 1. Install vertical wire extensions pointing up for security.
      2. Install vertical wire extensions pointing down for safety.
    1. Upon cutting or trimming, a post or a wire mesh section, apply a zinc rich primer to the exposed ends and finish with matching touch-up paint supplied by the manufacturer.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* + 1. Barbed wire: Uniformly space parallel rows of barbed wire on security side of fence. Pull wire taut and attach to each extension arm. The extension armed is fastened to the post.
  1. GATE OPERATOR INSTALLATION
     1. General: Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.
     2. Excavation for Supports: Hand-excavate holes for bases, in firm, undisturbed or compacted soil to dimensions and depths and at locations as required by gate operator component manufacturer's written instructions and as indicated on Drawings.
     3. Concrete Bases: Cast-in-place or precast concrete, made of not less than 3000 psi (20.7-Mpa) compressive strength (28 days), depth not less than 12 inches (300 mm) below frost line or detail on Drawings, dimensioned and reinforced according to gate operator component manufacturer's written instructions and as indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\*Include for Vehicle Loop Detectors. Delete if not required.

* + 1. Vehicle Loop Detector System Installation:
       1. Cut grooves in pavement to bury and seal wire loop according to manufacturer's written instructions.
       2. Connect to equipment operated by detector.
       3. Comply with NFPA 70 and manufacturer's written instructions for grounding of electric-powered motors, controls, and other devices.
  1. GATE INSTALLATION AND ADJUSTMENT
     1. Install gate posts in accordance with manufacturer's instructions.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* + 1. Concrete Set Gate Posts:
       1. Drill holes in firm, undisturbed or compacted soil.
       2. Holes shall have a diameter 4 times greater than outside dimension of post, and depths at least 6 inches (150 mm) deeper than frost level.
       3. Set post bottom 36 inches (914 mm) below surface when in firm, undisturbed soil.
       4. Excavate and set posts deeper where required for adequate support in soft and loose soils, and for posts with heavy lateral loads.
       5. Place concrete around posts in a continuous pour, tamp for consolidation.
       6. Trowel finish around gate posts and slope to direct water away.
       7. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.
    2. Install gates perfectly horizontal and levelled (at junction), plumb, and secure for full opening without interference.
    3. Attach hardware with nuts inside the property making the assembly tamper-proof to prevent unauthorized removal. Install ground-set items in concrete for anchorage.
    4. Adjust hardware for smooth operation and lubricate where necessary to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
  1. GROUNDING AND BONDING
     1. Unless otherwise indicated in Division 26 Electrical, or grounding resistance is unusually high, provide the following.
     2. Fence Grounding: Maximum intervals of 1500 feet (450 m).
     3. Fences within 100 feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet (225 m).
     4. Gates and Other Fence Openings: Ground fence on each side of opening.
        1. Bond metal gates to gate posts.
        2. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities.
        3. Use No. 2 AWG wire and bury it at least 18 inches (460 mm) below finished grade.
     5. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

\*\* NOTE TO SPECIFIER \*\*Select material above finished grade. Delete type not required.

* + 1. Material Above Finished Grade: Copper.
    2. Material Above Finished Grade: Aluminum.
    3. Material On or Below Finished Grade: Copper.
    4. 3 Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
    5. Connectors and Ground Rods: Listed in UL 467.
    6. Connectors for Below-Grade Use: Exothermic welded type.
    7. Ground Rods: Copper-clad steel, sized 5/8 x 96 inches (16 by 2400 mm).
    8. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet (45 m) on each side of crossing.
    9. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2, unless otherwise indicated.
    10. Grounding Method: At each grounding location, drive a ground rod vertically until the top is 6 in. (150 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location.
    11. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
    12. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
        1. Use electroplated or hot-tin-coated materials to ensure high conductivity to make contact points closer in order of galvanic series.
        2. Make connections with clean, bare metal at points of contact.
        3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
        4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
        5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
    13. Bonding to Lightning Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor complying with NFPA 780

\*\* NOTE TO SPECIFIER \*\*Indicative only. Consult local professional for proper design.

* 1. FIELD QUALITY CONTROL- GROUNDING

\*\* NOTE TO SPECIFIER \*\*Select testing agency by the Contractor or Owner. Delete option not required.

* + 1. Ground-Resistance Testing Agency: Contractor shall engage a qualified independent testing agency to perform field quality-control testing.
    2. Ground-Resistance Testing Agency: Owner will engage a qualified independent testing agency to perform field quality-control testing.
    3. Ground-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure ground resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by two-point method according to IEEE 81.
    4. Desired Maximum Grounding Resistance Value: 25 ohms.
    5. Excessive Ground Resistance: If resistance to ground exceeds desired value, notify Architect promptly. Include recommendations to reduce ground resistance and proposal to accomplish recommended work.
    6. Report: Prepare test reports, certified by testing agency, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* 1. GATE OPERATOR ADJUSTING
     1. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
     2. Automatic Gate Operator: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices, alarms, and limit switches.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Electrohydraulic Operator: Purge operating system, adjust pressure and fluid levels, and check for leaks.
      2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Perform tests to confirm that operation meets desired function. Remove damaged and malfunctioning units, replace with new units, and retest.
    1. Lubricate moving parts.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* 1. GATE OPERATOR DEMONSTRATION
     1. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain gates.
        1. Test and adjust operators, controls, devices and operating hardware. Replace damaged or malfunctioning operable components.
        2. Train Owner's personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
        3. Review data in maintenance manuals. Refer to Division 1. For demonstration and documentation requirements.
     2. Schedule training with Owner with at least 7 days notice.
  2. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION