



- STRONGHOLD IRON FENCE PARTS AND MATERIALS SPECIFICATIONS -

PART 1.01: MATERIALS

- **STEEL:** All steel material for the fence and gate system shall conform to the requirements of ASTM A-787 and ASTM A653 with minimum yield strength of 50,000 psi. All components are galvanized inside and out for superior rust protection.
- **CAST IRON:** All iron components are made of ductile iron for superior strength (versus standard grey iron) and are galvanized prior to powder coating for extra rust protection. All iron pieces will be sand-cast.

PART 1.02: FENCE PANELS

1.02A – SIGNATURE GRADE FENCE PANELS

- **HORIZONTAL RAILS** - Rail members will be constructed of 1 ½" x ½" x 1/8" (11 gauge) cold rolled bar channel. Number of rails per-piece will vary by panel style. Rails will be punched for picket pass-through and welding from underneath.
- **PICKETS:** Material for the pickets will be ¾" x ¾" x 16 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 6" tall x 2" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.

1.02B - TRADITIONAL GRADE FENCE PANELS

- **HORIZONTAL RAILS** - Rail members will be constructed of 1" x ½" x 1/8" (11 gauge) cold rolled bar channel. Number of rails per-piece will vary by panel style. Rails will be punched for picket pass-through and welding from underneath.
- **PICKETS:** Material for the pickets will be ½" x ½" x 18 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 4" tall x 1" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.



PART 1.03: WALK GATES

1.03A – SIGNATURE GRADE WALK GATES

- **FRAME:** All walk gates will match fence panel styles and be framed with 2" x 2" x 14 gauge square tubing mitered and welded.
- **HORIZONTAL RAILS** - Rail members will be constructed of 1 ½" x ½" x 1/8" (11 gauge) cold rolled bar channel. Rails will be punched for picket pass-through and welding.
- **PICKETS:** Material for the pickets will be ¾" x ¾" x 16 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 6" tall x 2" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.

1.03B –TRADITIONAL GRADE WALK GATES

- **FRAME:** All walk gates will match fence panel styles and be framed with 1.5" x 1.5" x 14 gauge square tubing mitered and welded.
- **HORIZONTAL RAILS** - Rail members will be constructed of 1" x ½" x 1/8" (11 gauge) cold rolled bar channel. Rails will be punched for picket pass-through and welding.
- **PICKETS:** Material for the pickets will be ½" x ½" x 18 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 4" tall x 1" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.



PART 1.04A: SIGNATURE GRADE ESTATE DRIVEWAY GATES

- **FRAME:** All estate gates will match fence panel styles and be framed with 2" x 2" x 11 gauge square tubing mitered and welded.
- **HORIZONTAL RAILS** - Rail members will be constructed of 1 ½" x ½" x 1/8" (11 gauge) cold rolled bar channel. Rails will be punched for picket pass-through and welding. Center horizontal rail provided for extra strength and easy automatic closer installation.
- **PICKETS:** Material for the pickets will be ¾" x ¾" x 16 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 6" tall x 2" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.

PART 1.04B: TRADITIONAL GRADE ESTATE DRIVEWAY GATES

- **FRAME:** All estate gates will match fence panel style and be framed with 2" x 2" x 11 gauge square tubing mitered and welded.
- **HORIZONTAL RAILS** - Rail members will be constructed of 1" x ½" x 1/8" (11 gauge) cold rolled bar channel. Rails will be punched for picket pass-through and welding. Center horizontal rail provided for extra strength and easy automatic closer installation.
- **PICKETS:** Material for the pickets will be ½" x ½" x 18 gauge square tubing.
- **PICKET SPACING:** Standard pickets will have a 3.875" air gap in-between. Double or puppy pickets will have a 1.56" to 1.69" air gap.
- **FINIALS:** Finial tips will be 4" tall x 1" wide and are sand-cast from ductile iron with a safety ball top as part of the casting. All cast iron finial tips will be welded to the picket.



PART 1.05: POSTS AND STANDARD HARDWARE

- **STANDARD STEEL POSTS:** All posts used for hanging fence panels and walk gates will be 14 gauge and offered in a 2", 2.5", 3" and 4" square tube size. Lengths include 5', 6', 7', 8', and 9' with availability varying by post diameter.
- **STEEL FLANGE POSTS:** Posts with a welded foot for mounting to surfaces will be 14 gauge and offered in a 2.5" square tube size. Lengths offered are 3', 4', 5 and 6'. Welded flange foot will be 5" square with a 1/2" hole in each corner for hardware.
- **ESTATE GATE POSTS:** All heavy-duty estate gate posts will be 3/16" thick (7 gauge) and offered in a 4" and 6" square tube size. Available in 8' and 9' lengths.
- **POST CAPS:** All post caps are comprised of sand-cast ductile iron. Offered in standard and ball style to match all available post sizes.
- **SIGNATURE GRADE FENCE PANEL BRACKET:** Brackets are comprised of sand cast ductile iron. The bracket has a 1.5" wide x 1/2" tall x 1" deep inner diameter (ID) and a 1.875" wide x 1" tall x 1" deep outer diameter (OD). A 3/4" tab with opening for a #14 hex head screw hangs below the bottom.
- **TRADITIONAL GRADE FENCE PANEL BRACKET:** Brackets are comprised of sand-cast ductile iron. The bracket has a 1" wide x 1/2" tall x 1.25" deep inner diameter (ID) and a 1.375" wide x 1" tall x 1" deep outer diameter (OD). A 3/4" tab with opening for a #14 hex head screw hangs below the bottom.
- **J-BOLT HINGES:** Used for walk gates and drive gates. Offered in a 5" size (5/8" shank) for walk gates and 7" size (3/4" shank) for drive gates. Both sizes feature adjustable gate settings and installed grease zerks.
- **HINGE BOLT KIT:** Comprised of stainless steel bolts, nuts and washers in various sizes to work with all hinge and post sizes.
- **SELF-TAPPING SCREWS:** Used to secure panels to the post via bracket. Hex-head configuration and is sized 1" x #14. All screws are steel have an anodized black finish for rust inhibition.



STRONGHOLD IRON FENCE FABRICATION

PART 2.01 – ASSEMBLY

- **RAILS:** All horizontal rails will be cold rolled and punched at approximately 4 ½” on center to provide an air gap of 3.875”.
- **PICKET TO RAIL WELDING:** All items will be firmly positioned square in a jig fixture and MIG welded with the use of an inert shielding gas to reduce splatter and insure good penetration. Each picket will be welded on at least two sides at the juncture of every rail. All weld spots are then coated in a zinc rich primer for extra rust protection.
- **PICKET SPACING:** Standard pickets will have a 3.875” air gap in-between. Double or puppy pickets will have a 1.56” to 1.69” air gap.
- **FINIAL TO PICKET WELDING:** Finials will be placed on top of pickets and then MIG welded on all four sides with the use of an inert shielding gas to reduce splatter and insure good penetration. All welds are then cleaned for appearance and coated in a zinc rich primer for extra rust protection.
- **WALK AND DRIVE GATES:** All Gate frames are miter cut in the corners and MIG welded with the use of an inert shielding gas to reduce splatter and insure good penetration. Using gate jigs, the picket and rail components are then MIG welded to the frame. All welds are then cleaned for appearance and coated in a zinc rich primer for extra rust protection.

STRONGHOLD IRON FENCE FINISHING

PART 3.01 – FINISHING

- **CLEANING:** All finished pieces are inspected for weld spatter and wire brushed accordingly. The inspected pieces then go through a 4-stage pretreatment and wash cycle to remove any impurities from handling and the manufacturing process.
- **POWDER COATING** – A satin black polyester-based TGIC powder coating is electrostatically applied to a minimum 2.5 mils to all finished pieces. The powder contains a UV fade inhibitor to help resist fading of the finish.



WROUGHT IRON FENCE LONGEVITY CASE STUDIES

PART 4.01 – LONGEVITY

SOURCE: AMERICAN GALVANIZERS ASSOCIATION (www.galvanizeit.org)

How long will hot-dip galvanizing protect my steel from corrosion?

The corrosion rate of zinc and how long it will provide protection is a function of the coating thickness and the amount of corrosive elements in the atmosphere. For example, in rural settings where there is less automotive/truck exhaust and plant emissions, galvanized steel can easily last for 100 – 150 years without maintenance. Industrial and marine locations contain significantly more aggressive corrosion elements such as chlorides and sulfides and galvanized steel may last for 50 – 100 years in those cases. The relationship between coating thickness and atmospheric conditions is contained in a popular graph developed by the AGA.

Where are galvanized steel products used?

First of all, the variety of things galvanized is broad. Structural steel (angles, channels, wide-flange beams, I-beams, H-beams), grating, expanded metal, corrugated sheets, wire, cables, plate, castings, tubing, pipe, bolts & nuts. The industries that utilized hot-dip galvanized steel range from bridge & highway (reinforcing steel for decks and column concrete, girders, stringers, light and signposts, guardrail, fencing), water & wastewater treatment plants (walkway grating/expanded metal, handrails) architectural (facades, exposed structural steel, lentils), parking garages (reinforcing steel for concrete decks, exposed structural steel columns and barriers), pulp & paper plants (structural steel, walkways, handrail), OEMs (motor housings, electrical cabinets, frames, heat exchanger coils), electrical utilities (transmission towers, distribution poles, substations, wind turbine poles), communication (cell towers), rail transportation (poles, switchgear, miscellaneous hardware), chemical/petro-chemical (pipeline hardware, manufacturing buildings, storage tanks, walkways), recreation (boat trailers, stadiums, arenas, racetracks), and many more.

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Cuyahoga Falls OHIO 44223



DISTINCT FROM FORGE TO FINISH.

CASE STUDY #1:

Baseball Hall of Fame, Main Entrance

DATE GALVANIZED
2008

ENVIRONMENT
Industrial/Urban

LOCATION
Cooperstown, NY

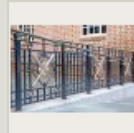
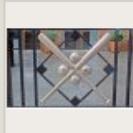
SECTOR
Duplex Systems
Building & Architecture
Artistic

REASON FOR GALVANIZING
Aesthetics
Durability
Corrosion Protection

PROJECTED FIRST MAINTENANCE
72 years

PROJECT DESCRIPTION

Home of one of the most universally known sports museums in the world, the Cooperstown Baseball Hall of fame is an extremely popular vacation spot. The handrail located on the front entrance of the building is passed by thousands of people daily. The original rails had become corroded and worn. Paint alone was not enough to keep the Baseball Hall of Fame entrance welcoming. A face lift was needed, and a duplex system of hot-dip galvanizing (HDG) and powder coating was chosen for the job. It was essential the Baseball Hall of Fame entrance would have a lasting beautiful finish, the layer of HDG provides the sacrificial protection lacking in the original railing and the barrier system of power coating gives another layer against New York's corrosive elements. The duplexed protection of the Baseball Hall of Fame entrance will enable the railing to live a legacy parallel to America's favorite pastime.





DISTINCT FROM FORGE TO FINISH.

CASE STUDY #2:

Ironwood Highway Guardrail System

DATE GALVANIZED
1999

ENVIRONMENT
Rural

LOCATION
Jefferson County, NY

SECTOR
Bridge & Highway

REASON FOR GALVANIZING
Corrosion Protection
Safety

PROJECTED FIRST MAINTENANCE
120 years

PROJECT DESCRIPTION

Jefferson County, N.Y. has developed an amazing new guardrail system. This new, reinforced system not only makes driving safer for commuters, but it also adds to the beauty of the surrounding environment. The Ironwood Highway Guardrail System is the only federally approved alternative to weathering steel guardrail systems, and provides the organic aesthetics of wood with the safety, strength and durability of hot-dip galvanized steel. The most important reason for deciding to use hot-dip galvanizing as the corrosion prevention system is that nine tons (8 tonnes) of hot-dip galvanized steel protect the guardrail from upstate New York's aggressive environment. Through the years, the guardrail will encounter various destructive elements that it will have to fend off: intense moisture coming off Lake Ontario, fertilizers, herbicides and road maintenance elements like salt and sand. Another advantage of hot-dip galvanizing is the significantly lower maintenance and repair costs when compared to previously used corrosion prevention systems.

