

**SPECIFICATION FOR CONSTRUCTION & INSTALLATION FOR
StackedStone™, OldBrick™, ChiselStone™, WoodCast™ and RanchRail™
PRECAST CONCRETE FENCE**

SECTION 1 - GENERAL

1.01 INTENT:

1. This specification states the conditions and requirements applicable to Hilltop Concrete's precast concrete fences WoodCast™, StackedStone™, OldBrick™, ChiselStone™ and RanchRail™
2. Specifications and drawings supplement each other and together constitute one complete set of specifications and drawings, so that any work exhibited in one and not in the other shall be executed just as if it had been set forth in both.
3. It is understood and agreed that the work shall be performed and completed according to the true spirit, meaning, and intent of the contract and specifications.
4. Shall anything be omitted from the specifications, which is necessary to a clear understanding of the work, or should it appear that various instructions are in conflict, then the contractor shall secure written instructions from the Owner before proceeding with the construction affected by such omissions and / or discrepancies.

1.02 STANDARDS:

1. Applicable ASTM Standards, latest revision, as published by the American Society for Testing and Materials and indicated hereinafter.

A. CONTRACTOR RESPONSIBILITIES

1. Fence contractor is responsible for laying out the fence lines, including fence corners and gate locations.
2. Fence contractor is responsible for clearing all trees & underbrush, which may be in the fence lines. All cleared trees and underbrush shall be removed from the job site by the fence contractor.
3. Fence contractor is responsible for contacting appropriate personnel for locating all underground utilities within the work area. Owner to provide assistance when requested by Contractor.
4. Fence contractor is responsible for providing a competent crew with a minimum of three workers on the job at all times.

B. SAFETY

1. The work shall be performed in accordance with all applicable federal, state, and local safety laws and regulations, including the Occupational Health and Safety Act of 1970 as amended (OSHA).
2. The contractor shall be responsible for the observance of proper safety practices and the avoidance of damage to property by all personnel engaged in the work. It is the Contractor's responsibility to be aware of and observe any recommended practice or regulations concerning the handling of construction materials called for on this project.
3. The Contractor shall take all steps necessary to prevent damage to or interference with the existing power lines, communication facilities, roadways, railroads, waterways, buried cables, pipelines, and other facilities on, adjacent to, or crossing the project property.

C. SUBMITTALS

1. Color to be selected by Owner from manufacturer's range of standard colors.

2. Shop Drawings: Owner or Contractor, if requested, to provide working drawings indicating all information necessary for precast fence elements. Drawings shall illustrate the shape and dimension of precast components; the size, quantity and details of the reinforcing steel; the quantity, type, size and details of connection and lifting hardware (if needed); the size and location of drain openings; and any additional details necessary. Drawings shall bear the seal of a registered professional engineer.
3. Design Calculations: Owner or Contractor, if requested, to furnish design calculations which include a summary of all design parameters used, including material types, strength values, allowable stresses, assumed loads and load combinations. Calculations shall be submitted covering the range of heights and loading conditions on the project. Calculations shall bear the seal of a registered professional engineer.
4. Soil Conditions: Owner to provide soil samples or a copy of a soils report to Contractor and/or engineer for design of piers/posts based on wind load calculations.
5. Samples: Manufacturer to furnish samples of each type, texture and color of concrete screening wall of interest where applicable.

D. QUALITY ASSURANCE

1. Qualifications: Engage an experienced Installer who has experience with architectural precast concrete fence projects with same material and of similar scope to the Project.
2. Obtain concrete fence materials trade marked as WoodCast[®], StackedStone[®], OldBrick[®], ChiselStone[™] and RanchRail[™] manufactured in the United States.
3. Manufacturer Qualifications: A firm experienced in producing precast concrete fence units in accordance to those indicated for the Project, as well as sufficient production capacity to produce required units without delaying the Work.

E. PROJECT CONDITIONS

1. Field Measurements: Verify layout information for fences and gates shown on the Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.
2. All existing fence or fence line obstructions are to be removed by fence contractor prior to commencement of work.

SECTION 2 – PRODUCTS

A. MATERIALS

1. Suppliers: Subject to compliance with requirements, that may be incorporated in the work include the following:
 - a. Hilltop Concrete
18775 F.M. 2496
Flint, TX 75762
Phone: (903) 630-5465
 - b. No substitutions allowed.
2. Precast Concrete Fence Wall System (panels and posts) designated as WoodCast[™], StackedStone[™], OldBrick[™], ChiselStone[™] and RanchRail[™].
 - a. 6'-0" - 15'-0" high
 - b. Panels and posts to have same texture on both sides.
 - c. Includes textured post caps (line, end and corner) and / or panel caps.
 - d. Panel, Posts and caps shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type I or Type III Portland Cement and shall have a compression strength of 5,000 psi @ 28 days.
 - e. Concrete to be thoroughly mixed and vibrated.
 - f. Steel reinforced panels and rebar reinforced posts and rails. Rebar conforms to ASTM A615, grade 60. Fiber to be used in all components as a secondary reinforcement.

- g. Wall posts set five feet apart, or per manufacturer's recommendations.
- h. Post footings: 5' on center (maximum). 8'-0" on center for RanchRail™
- i. Loading: Wind loading and surcharge loads will be applied to the panels, columns, and foundation components per local building code requirements and per section G (Design Loading).

B. PRECAST FENCE COMPONENTS DIMENSIONS

1. Posts shall have a typical cross sectional dimension of 5" as measured from face-to-face.
2. Posts to 8' high shall be reinforced with 1 #4 rebar, each face. 9' and 10' posts to have 2 #4 rebar each face.
3. Method of post attachment to concrete footing / pier shall be by embedment in poured concrete. Depth of concrete pier, and embedment of post shall be as shown on Shop Drawing from manufacturer.
4. Panels shall have typical dimensions of 56 5/8" long by 12" high by 2" wide at its maximum dimension and no less than 1 1/2" wide at its minimum dimension.
5. Panels shall have an interlock construction.
6. Panel caps shall have typical dimensions of 56 1/2" long by 2" high by 4" wide.
7. Panel caps shall be reinforced with 1 - #4 rebar positioned in mold with rebar clip #RCL 75 by Conac or equivalent.

C. COLOR

1. As selected from manufacturer's range of standard colors.

D. PIERS (POST FOOTINGS) DESIGN

1. 5' on center (maximum), 8'-0" on-center for RanchRail™
2. Diameter: 12" minimum and per design calculations.
3. Depth: 30" minimum and per design calculations.
4. Reinforcement: None, unless required per design calculations.
5. Where a precast fence post shares the same pier with a steel gatepost, size of pier shall be increased to accommodate both posts. Concrete for this pier shall have a minimum compressive strength of 3,000 psi @ 28 days.
6. Concrete for line post piers shall be normal weight concrete having sand and gravel or crushed stone aggregates mixed with ASTM-C150, Type I or Type III Portland Cement and shall have a minimum compression strength of 2,500 psi @ 28 days.

E. HEIGHT

1. 6'-0" - 15'-0" height (min) above grade, i.e., above top of crushed rock.
2. Gap between lower panel and top of base material grade shall be 2" (min) and 4" (max).
3. Lower panel shall be supported by concrete pier, existing grade or with a 1-1/4" outdoor grade PVC spacer pipe embedded in pier 2" (min), which has concrete filled to the top where and if applicable.

F. DESIGN LOADING (example) – actual depends on soil conditions and other requirements.

1. Loads Criteria
 - a. Wind velocity (V): 110 MPH
 - b. Exposure: B
 - c. Importance Factor (I): 1.0
 - d. Velocity Pressure Exposure Coefficient (K_z): 0.70

- e. Wind Directionality Factor (K_D): 0.85
- f. Topographical Factor (K_{ZT}): 1.0
- g. Wind Pressure $P = 0.00256 (K_z) (K_{ZT}) (K_D) (V^2) (I)$
 $P = 0.00256 (0.70) (1.0) (0.85) (85^2) (1.0)$
 $P = 11.0 \text{ psf}$
- h. Working Design Stress: 33% Increase (1.33)
- i. Seismic Design: Site Class D

G. CONCRETE

1. Concrete Material

- a. Concrete shall be normal weight concrete having sand and gravel or crushed stone aggregates, mixed with ASTM-C150, Type I or Type III Portland Cement to meet the minimum compressive strengths as follows.
 - Panels & posts: 5,000 psi @ 28 days
 - Line post piers: 3,000 psi @ 28 days
 - Gate post / line post shared pier: 3,000 psi @ 28 days
- b. Water used for concrete shall be clean water and free from injurious amounts of oils, alkalis, organic or other deleterious substances.
- c. All concrete permanently exposed to the weather shall contain an air entraining admixture resulting in 3 to 6% entrained air or as recommended by the manufacturer.

3. Reinforcing Materials:

- a. All reinforcing steel shall be deformed type bars and conform to ASTM – A615, Grade 60, placed as shown on the drawings.
- b. All ties and stirrups shall conform to the requirements of ASTM-A615, Grade 40.
- c. All wire mesh shall be 9 gauge galvanized having 2 horizontal bars and at least 4 vertical bars.

SECTION 3 – EXECUTION

A. INSTALLATION

1. Install precast concrete fence per manufacturer's recommendations.
2. Reinforcement steel, bars and wire fabric shall be thoroughly cleaned before placing and again before the concrete is placed, shall be accurately positioned and secured in place. Provide standard bar charts for all beam steel off the ground.
3. Install all reinforcement with the following clearances between reinforcing steel and face of concrete:
 - Footing, pier or beam bottom: 3"
 - Earth-formed pier or beam sides: 2"
 - Formed footing, pier or beam sides exposed: 1"
 - Precast exposed to weather: panels $\frac{3}{4}$ "; post 1 $\frac{1}{4}$ "
4. Splices within continuous unscheduled reinforcing steel shall have a minimum lap of 30 bar diameters.
5. Footing size shall be based on soil properties at the site.
6. Fresh poured concrete shall be tamped into place by steel rammer, slicing tools or mechanical vibrator until concrete is thoroughly compact and without void.
7. Make excavations for footing to undisturbed soil or to the depth noted on the drawings. Leave the bottom-bearing surface clean and smooth. If footing excavations are made deeper than intended, only concrete shall be used for fill. Remove all loose material from grade beam excavations prior to concrete pour.
8. Align and level posts and panels to be plumb.

B. TESTING OF CONCRETE

1. The contractor shall be responsible for the following concrete tests (varies according to customer requirements):
 - 1 air entrainment test of fence and also each gate opening.
 - 2 slump tests of fence and also at each gate opening.
 - 4 test cylinders of fence and also at each gate opening including 1-7 day break, 2-28 day breaks, 1-spare
2. Slump test shall be done under the direct supervision of Owner. Slump of concrete shall be determined in conformity with ASTM, Standard Method C-143. The contractor shall be responsible for securing, transporting and testing of all concrete test specimens. Concrete test reports shall be forwarded to and shall become the property of the Owner.
3. Owner reserves the right to make any tests necessary to insure that the concrete conforms to the specifications.
4. All cost involving the testing of concrete by the contractor shall be the responsibility of the contractor, if included in price.

C. DAMAGED UNITS

1. Contractor shall replace panels and other components of work that have been damaged.
2. Cleaning: Prior to substantial completion of fence, Contractor shall clean surfaces of fence as recommended by fence manufacturer.

D. CLEANUP

1. Contractor shall clean up site and dispose of all debris, trash, excavated soil, etc. to the satisfaction of the construction inspector.

E. WARRANTIES

1. General
 - a. The fence manufacturer shall furnish written warranties covering materials and workmanship and color finish of precast elements. Such warranties shall cover the full cost of materials to replace or repair defective materials per the conditions of the manufacturer
2. Durations of Warranties
 - a. All materials and workmanship shall be warranted for a period of 5 years from the date of shipment.

F. LIMITATIONS

1. Product is intended for exterior fencing applications.
2. Product shall not be used alone as a retaining wall for the support of soils and other structural elements unless otherwise noted by the structural engineer.

END