



TECHNICAL SPECIFICATIONS

**INFORMAL BID REQUEST 041114IBR
GLOBE JAIL PEDESTRIAN BYPASS**

DEMOLITION

Contractor to minimize impact and disruption of jail access.

Contractor access shall be at the exterior of the jail only. No access within enclosed secured fencing, unless coordinated and approved by Gila County Facilities Department.

Contractor to restore or repair any damaged existing concrete sidewalks, fencing and their supports damaged by the contractor, or his subcontractors, during construction. The Owner to review repair work with the Contractor and approve prior to final acceptance and payment.

SUBMITTALS REQUIRED:

Drawings and/or Engineering

Chain-link Fencing:

Contractor shall provide 2 sets of manufacturer's shop drawings for all fencing work, to include attachment details, for review and approval, prior to doing the work.

CONCRETE

GENERAL

All concrete work and testing thereof shall meet the minimum requirements outlined in the 2003 IBC Chapter 19 and ACI Standards 301 and 318. Any non-conforming work shall be removed and replaced at the contractor's expense.

Foundation wall waterproofing must be backfilled within 3 days. Inspection required prior to backfill.

INSTALLERS QUALIFICATIONS

An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

FORMWORK

Contractor shall supply all permanent or temporary formwork complete with necessary shoring, bracing and anchorage.

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Forms shall remain in place throughout any required curing period. All portions or pieces of any wood forms shall be removed completely after the cure period has been completed and prior to Owner possession.

REINFORCEMENT

Reinforcing steel shall be a minimum of 60 ksi yield grade, deformed. Clean reinforcement free of loose rust and mill scale, earth, ice, and other foreign materials.

Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place

All anchors and inserts in exterior work exposed to weather shall be inset and/or protected to prevent rusting.

CAST-IN-PLACE CONCRETE

Materials:

All cast in place concrete shall be designed to obtain a minimum compressive strength of 3000 psi within 28 days.

Portland Cement: ASTM C 150, Type I/II or II.

Aggregate Class: ADOT Class #2

Water: Potable and complying with ASTM C 94.

Concrete Mixing:

Owner shall approve changes in concrete mix design, prior to doing work. Adjustments to water and/or fly ash shall be approved by the Owner, prior to placement.

Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and C 1116, and furnish batch ticket information.

- When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

Admixtures:

Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride. Any of the following mixtures may be used for mix designs:

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- Water-reducing Admixture: ASTM C 494, Type A.
- Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

Use admixtures according to manufacturer's written instructions.

- Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
- Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- Use corrosion inhibiting admixtures in concrete where indicated.

Testing

Concrete Testing Service: Contractor shall engage a qualified independent testing agency to perform material evaluation tests.

Testing Agency Qualifications: An independent testing agency, acceptable to the Owner, qualified according to ASTM C1077 and ASTM E329 to conduct the testing indicated. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade I. Personnel performing laboratory tests shall be ACI-Certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician – Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician – Grade II.

Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

- Testing Frequency: Obtain at least one composite sample of each 100 cu yd. or fraction thereof of each concrete mixture placed each day. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
- Slump: ASTM C143 / C143M: one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
- Concrete Temperature: ASTM C1064 / C1064M, one test hourly when air temperature is 80 deg F and above, and one test for each composite sample.
- Compression Test Specimens: ASTM C31 / C31M, cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
- Compressive-Strength Tests: ASTM C39 / C39M, Test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days. Test one set of field cured specimens at 7 days and one set of two specimens at 28 days. Test specimens at 28 days may be removed from testing if 7-day test exceeds 28-day strength. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
- When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

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- Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength and no compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500psi.
- Tests shall be reported in writing to the Owner and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.
- Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by the owner. Testing and inspecting agency may conduct test to determine adequacy of concrete by cored cylinders complying with ASTM C42 / C42M or by other methods as directed by the Owner.
- Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- Correct deficiencies in the Work that test reports and inspections indicate does not comply with Contract Documents.

Sub-base (below slab):

Aggregate Base Course (ABC): Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 8, with 100 percent passing a ½ inch (9.5-mm) sieve, 10 to 30 percent passing a No. 100 (0.15-mm) sieve, and at least 5 percent passing No. 200 (0.075-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

Related Materials:

Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

Epoxy Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.

Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

Concrete Finishing:

Exterior concrete sidewalk surfaces shall be finished with a heavy broom finish.

Exterior concrete sidewalks shall be finished so as to slope a minimum of 1/4" per foot to drainage. Ponding or puddling resulting from finish work that does not address this requirement shall be repaired and / or replaced at the Contractor's expense.

Concrete Curing:

All concrete must be cured. Compounds, water curing or blanket protection is acceptable as applicable.

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The Contractor is solely responsible for protection of all concrete products throughout the curing period. Any damage to partially cured concrete shall require removal and replacement at no cost to the Owner.

Structural concrete must be cured a minimum of three days. Normal concrete in structures and pavement shall be cured a minimum of 7 days.

Formed concrete, forms shall remain in place until work has reached 90% of its design strength.

Joists:

Construction Joints true to line with faces perpendicular to surface plane of concrete. Install construction joints so strength and appearance of concrete are not impaired. Continue reinforcement across construction joints, unless otherwise indicated. Dowel plates are not required when reinforcing is present. Provide dowel plates in slab-on-grades for unreinforced concrete.

Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

- Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
- Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- Provide contraction joints in slab-on-grade at a maximum spacing on 10' on center each way, unless noted otherwise on plans.

Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, exterior slab locations, and other locations, as indicated.

- Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surfaces, unless noted otherwise.
- Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
- Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

MASONRY

GENERAL

Any masonry work shall conform, at a minimum to the requirements set forth in the International Building Code Chapter 21.

When the ambient temperature is less than forty degrees F, masonry work shall not be constructed without heat, heated materials, and/or protection.

INSTALLERS QUALIFICATIONS

An experienced installer who has completed masonry work similar in material, design, and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

MORTAR

Mortar: Portland cement, ASTM C150, normal-Type 11, low alkali. Hydrated lime: ASTM C 207, Type S. Sand to conform with ASTM C144.

Mortar mix design shall be based on an alkali free or low alkali cement (no more than 0.1 percent) in order to reduce the potential for efflorescence.

ACCESSORIES

All anchors or ties embedded within masonry systems shall be coated or of corrosion resistant materials.

Control and expansion joints shall be incorporated into straight wall masonry construction which exceeds forty feet. Maximum spacing of 20'.

Horizontal wire reinforcing: No.9 gauge wire, Class 1 mil galvanized.

Weepholes: Polyethylene plastic tubing, 1/4" dia. x 4" long.

Sealer: Waterproofing sealer, guaranteed performance minimum 5 years from UV breakdown.

UNIT MASONRY

Severe weather (SW) brick or waterproofed concrete masonry units shall be used. Contractor shall take precautions to ensure that finished unit masonry is, and shall remain, free from efflorescence and discoloration. These precautions shall include: sealants such as Blocktite or mortar mixes, washing and waterproofing of finished water panels, and specification of ASTM Test E-67 (efflorescence test) on large projects. Brick and concrete unit installations shall carry a 2 year warranty against efflorescence.

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All mortar joints should be full joints.

Partially completed walls should be covered at the end of each working day, or when work is not in progress, with a strong weather resistant material to prevent contamination.

Cold weather construction shall comply with IBC requirements 2104.3. Covers shall drape over both sides and be securely fastened.

All materials should be stored in a dry area. To prevent ground water contamination masonry units, cements, limes and sand should not be stored on the ground.

CHAIN-LINK FENCES AND GATES

SUBMITTALS:

SHOP DRAWINGS: Provide copy of manufacturer's shop drawings, with dimensions, and technical data, including installation instructions for fence and gate posts, fabric, gates and accessories. Details shall include post installation instructions.

INSTALLER QUALIFICATIONS:

Installer shall have a minimum of 3 years experience, completing no less than 5 chain-link fencing projects with same material and similar scope to that indicated for this project, with a successful construction record of in-service performance.

SINGLE SOURCE RESPONSIBILITY:

Obtain chain-link fences and gates, including accessories, fittings, and fastenings, from a single source.

PROJECT CONDITIONS:

Contractor shall field verify layout information for fences and gates, as shown on the drawings, in relation to the property and existing site conditions.

PRODUCTS:

FABRIC:

Selvage: Knuckled on both selvages for 2 inch mesh.
Steel chain-link shall be fabricated in one-piece widths.
Mesh and wire size: 2 inch mesh, 0.148 inch diameter (9 gage)

FRAMING:

Terminal Posts, Gate Posts: Round members, 3 inch trade size, 2.875 inch OD, galvanized, Schedule 40

Type 1, round posts, standard weight (schedule 40), galvanized-steel pipe conforming to ASTM F 1083, according to heavy industrial requirements of ASTM F669, Group IA, with minimum yield strength of 25,000 psi, not less than 1.8 oz. of zinc per sq.ft.

Type A coating inside and outside according to ASTM A 90, and weight 7.58 lb/ft.

Top Rail, Mid Rail, Bottom Rail: 1 5/8" diameter, galvanized schedule 40. Shall be manufacturer's longest lengths (17'-21') with swaged-end or expansion-type coupling, approximately 6 inch long for joining. Provide rail ends or other means for attaching top rail securely to each gate corner, pull, and end post.

Steel Posts:

Round line or intermediate posts, 2.875 inch OD, Type 1 steel pipe.
Round end, corner, and pull posts: 3 inch OD, Type 1 steel pipe.

FITTINGS AND ACCESSORIES:

Material shall comply with ASTM F 626. Mill-finished galvanized steel to suite manufacturer's standards.

Steel, unless noted otherwise, hot-dip galvanized pressed steel fence fittings and accessories with at least 1.2 oz. zinc per sq.ft., as determined by ASTM A 90.

Post and Line Caps: Provide weathertight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail.

Post Brace Assembly: manufacturer's standard adjustable brace. Use Type 1 steel pipe. Truss to line posts with 3/8 inch diameter rod and adjustable tightener. Provide manufacturer's standard galvanized-steel cap for each end.

Bottom and Center Rail: Same as top rail. Provide manufacturer's standard galvanized-steel cap for each end.

Tension or Stretcher Bars: Hot-dip galvanized steel with a minimum length 2 inch less than the full height of fabric, a minimum cross section of 3/16 inch by 3/4 inch, and a minimum of 1.2 oz. of zinc coating per sq.ft. provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into the post.

Tension and Brace Bands: 3/4 inch wide minimum hot-dip galvanized steel with a minimum of 1.2 oz. of zinc coating per sq.ft. Tension bands 0.074 inch thick (14 gage) minimum. Brace bands 0.105 inch thick (12 gage) minimum.

Tension Wire: 0.177 inch diameter metallic coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric. Coating Type II zinc, Class 2, as determined by ASTM A 90, with a minimum coating weight of 1.20 oz. per sq.ft. of uncoated wire surface.

INSTALLATION:

General: Install fence to comply with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted. Apply fabric to outside of framework.

Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.

Center Rails: Install center rails in one piece between posts and flush with post on fabric side, using rail ends and special offset fittings where necessary.

Brace Assemblies: Install braces at end and gate posts and at end and gate posts and at both sides of corner and pull posts.

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Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric before stretching fabric and tie to each post with not less than same gage and type of wire. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120 inch diameter (11 gage) hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c.

Tie Wires: Use wire of proper length to secure fabric firmly to posts and rails. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts 12 inches o.c. and to rails and braces 24 inches o.c.

Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts for added security.