Hughston Homes
Builders

SPECIFICATION: CONCRETE

Hughston Homes: Georgia & Alabama Operations

Version 1.6

READ WITH: This Specification states the materials, reference standards, and methods for the concrete Work. It is governed by the Master Subcontractor General Requirements and is paired with the Concrete Scope of Work. All documents are read together.

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ARTICLE 1 Purpose and Relationship to Other Documents

This Specification states the materials, reference standards, and execution requirements for all concrete Work, footings, foundations, stem walls, slabs on grade, and flatwork, for Hughston Homes.

This Specification is governed by the Master Subcontractor General Requirements and is paired with the Concrete Scope of Work. In the event of a conflict, the order of precedence stated in the Master Subcontractor General Requirements governs; where requirements overlap, the more stringent governs; and the SUBCONTRACTOR shall immediately seek written clarification and direction from the CONTRACTOR for any perceived conflict in the language of these documents before proceeding.

ARTICLE 2 Reference Standards

The following standards are incorporated by reference and govern at the points in this Specification where they are invoked. Where a standard has been superseded, the current edition applies.

Standard	Title / Subject
Applicable residential code (IRC)	Minimum specified compressive strength (R402.2); footings and slabs (R403, R506). Georgia operations: 2024 IRC with Georgia amendments; Alabama operations: the adopted Alabama Energy & Residential Code.
ACI 318	Building Code Requirements for Structural Concrete (current adopted edition).
ACI 332	Code Requirements for Residential Concrete (current edition, ACI 332-20).
ACI 301	Specifications for Structural Concrete.
ACI 117	Specification for Tolerances for Concrete Construction and Materials.
ACI 347	Guide to Formwork for Concrete.
ACI 305 / ACI 306	Hot-Weather and Cold-Weather Concreting.
ACI Detailing Manual (MNL-66)	Presenting and detailing reinforcing steel (incorporates ACI 315R-18; the former ACI 315-99 standard is withdrawn).
ASTM C150	Portland Cement (Type I or II).
ASTM C33	Concrete Aggregates (fine and coarse).
ASTM C94	Ready-Mixed Concrete (batching, mixing, delivery).
ASTM C494	Chemical Admixtures for Concrete (Types A, G).
ASTM C260	Air-Entraining Admixtures for Concrete.
ASTM C309	Liquid Membrane-Forming Compounds for Curing Concrete.
ASTM C171	Sheet Materials for Curing Concrete.
ASTM A615	Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
ASTM A706	Low-Alloy Steel Deformed Bars, weldable reinforcement (use where bars are welded).
ASTM A1064	Steel Wire and Welded Wire Reinforcement (supersedes the withdrawn A185).
ASTM A36	Carbon Structural Steel (steel lintels).
ASTM E1155	Determining Floor Flatness (FF) and Levelness (FL) Numbers.
CRSI MSP	Manual of Standard Practice, placing and supporting reinforcement.
AWS D1.4	Structural Welding Code, Steel Reinforcing Bars.

ARTICLE 3 General Material Requirements

All materials shall be delivered in original, labeled containers or properly identified, and be free of defects and contamination.

The SUBCONTRACTOR shall not substitute any CONTRACTOR-specified material unless it is replaced with a product equal in quality, utility, and substance and approved **in writing** by the CONTRACTOR's Purchasing Manager.

All hardware shall be properly selected, sized, and used for its intended purpose and for the materials in contact with it. Micro and macro fiber mesh may be used in place of wire mesh or steel reinforcing only at the discretion of the Superintendent and as permitted by the Plan Documents.

Cold-weather and hot-weather additives are the SUBCONTRACTOR's responsibility and are included in pricing; no variance Purchase Order will be issued for seasonal additives. If required additives are omitted and cracking or freezing results, repair or replacement is at the SUBCONTRACTOR's expense.

ARTICLE 4 Materials Schedule

4.1 Concrete Materials

Material	Requirement
Cement	Portland cement, Type I or II, conforming to ASTM C150.
Aggregates	Per ASTM C33 grading and quality; suppliers must hold required DOT/agency approval, certified on request. Exterior flatwork uses low-chert stone.
Water	Clean and free of deleterious acids, alkalis, and organic material.
Water-reducing admixture	ASTM C494 Type A; chloride-ion content no greater than the municipal drinking water.
High-range water reducer (superplasticizer)	ASTM C494 Type F or G; chloride-ion content no greater than the municipal drinking water.
Air-entraining admixture	ASTM C260; designed to meet the project air-content target, adjusted for seasonal conditions.
Non-chloride accelerator	ASTM C494 Type C or E; required wherever reinforcing steel is present.
Fiber reinforcement	Synthetic micro/macro fiber where permitted, dosed per the manufacturer (typically 1.0 to 1.5 lb/cu yd).

No admixture of any kind shall be used without prior CONTRACTOR / Superintendent approval. Calcium chloride and calcium-chloride accelerators shall not be used where wire or steel reinforcement is present.

4.2 Reinforcement & Embedded Items

Material	Requirement
Reinforcing bar (rebar)	Deformed bars, Grade 60, ASTM A615, unless the drawings specify otherwise; use ASTM A706 where bars are welded or higher ductility is required (A615 is not intended for welding).
Stirrups & bent bars	Deformed bars, Grade 40 or 60 as shown on the drawings, ASTM A615 (ASTM A706 where welded).

Material	Requirement
Welded wire fabric (WWF)	ASTM A1064 (cold-drawn, resistance-welded).
Wire ties	16-gauge, annealed / galvanized steel wire.
Chairs / bar supports	Chairs, Dobie spacer blocks, or bar supports sized to achieve the specified cover; brick, block, and wood stakes are not permitted.
Anchor straps	Triple-zinc galvanized (Simpson MA / MAS or equal), approved for ACQ-treated lumber, at max 3.5′ o.c. and within 1′ of corners, unless the plans or jurisdiction require otherwise.
Steel lintels	ASTM A36, primed and ready to receive paint, unless noted otherwise.

4.3 Base, Barrier & Miscellaneous

Material	Requirement
Stone base	¾″ clean stone at slabs on grade, garage slabs, stoops, patios, and flatwork (except lead walks); depth and leveling per the Plan Documents.
Vapor barrier	6-mil plastic; laps and taping per Article 6.
Form materials	Sound lumber; where plywood is used for unexposed finished concrete, C-C EXT-APA. Form-release agent shall not stain or mar architectural finishes.
Sleeve inserts	ABS Schedule 40, sized accordingly.
Penetration bushings	“Hail-Mary” type as provided by the plumbing supplier, sized accordingly.
Curing compound	Liquid membrane-forming curing compound per ASTM C309; or a cure-and-seal compound (ASTM C1315) on exposed exterior flatwork. Do not use on interior slabs scheduled to receive flooring adhesive or coatings unless the product is compatible or fully removed first.
Curing sheet / blanket	Waterproof sheet or curing blanket per ASTM C171 where moisture curing is used.

4.4 Concrete Mixes

All concrete is specified at a uniform 3,000 psi minimum 28-day compressive strength for every pour, at or above the minimums in Table R402.2 of the applicable residential code.[1] Deliver at a 4″, 5″ slump; no more than one (1) gallon of water per cubic yard may be added on site, and only with the Superintendent’s approval.

[1] IRC Table R402.2 sets the minimum specified compressive strengths for residential concrete (2,500 psi for concrete not exposed to weather; 3,000 psi for weather-exposed flatwork, garages, and porches under moderate weathering). Hughston specifies a uniform 3,000 psi across all pours, which meets or exceeds these minimums. The table values are unchanged across the 2015 through 2024 editions of the IRC, so Alabama’s 2015-based residential code and Georgia’s 2024 IRC impose the same minimums; the differing adoptions change the edition referenced, not the concrete requirements. (Verified June 2026.)

Application	Min. 28-day Strength	Max w/c[2]	Notes
Footings, foundations, stem walls & interior slabs on grade	3,000 psi	0.50	Fiber and/or 6×6 WWF per plans
Garage floor slabs (steel-troweled)	3,000 psi	0.45	Reduced air content (≤ 3%) for a hard steel-trowel finish; fiber and/or WWF per plans
Exterior flatwork exposed to weather, porches, stoops, patios, steps, walks, drives	3,000 psi, air-entrained	0.45	Low-chert coarse aggregate; fiber and/or WWF per plans

[2] w/c = water-cement ratio, the ratio, by weight, of water to cementitious material in the concrete mix. The value shown is the maximum permitted for that application; a lower water-cement ratio produces stronger, denser, less-permeable, and more freeze-thaw-durable concrete.

Hughston specifies a uniform 3,000 psi minimum 28-day strength for all pours, at or above the IRC Table R402.2 minimums (2,500 psi for concrete not exposed to weather; 3,000 psi for weather-exposed flatwork, garages, and porches under moderate weathering). Exterior flatwork is air-entrained for freeze-thaw durability, and garage floor slabs use reduced air content so a hard steel-trowel finish can be achieved.

The mixes above are specified to the “moderate” weathering classification per IRC Figure R301.2(3), which governs across Hughston Homes’ Georgia and Alabama markets. In a jurisdiction rated “negligible,” exterior air-entrainment may be relaxed only with the building official’s and the project engineer’s written approval. Where deicing chemicals will be used, apply the supplementary-cementitious-material limits of ACI 318 §19.3.3.4.

ARTICLE 5 Environmental Conditions (Weather Concreting)

5.1 Cold Weather (per ACI 306)

Provide cold-weather protection whenever the air temperature is expected to fall below 40°F. Have all protection materials and equipment on site before placement.

Concrete temperature at placement shall be at least 40°F and rising; minimum temperature at mixing shall be at least 60°F. Remove all snow, ice, and frost, and do not place on frozen subgrade. Maintain the concrete at 55°F until it reaches a minimum compressive strength of 1,000 psi; if 55°F cannot be maintained, do not pour.

5.2 Hot Weather (per ACI 305)

Provide hot-weather protection whenever the ambient temperature rises above 90°F. Pre-dampen the subgrade and keep an approved evaporation retardant on hand. Use cool aggregates and/or chilled water as needed to keep the concrete below 90°F; concrete delivered above 90°F shall be rejected.

In hot weather, water may be added at the jobsite only to replace evaporation loss and only with the Superintendent’s approval, in no case more than one (1) gallon per cubic yard (Article 4.4), and never enough to exceed the mix-design water-cement ratio. After any approved addition, mix a minimum of 30 additional revolutions and take slump and cylinder tests from each truck, at the SUBCONTRACTOR’s expense.

ARTICLE 6 Subgrade & Base Preparation

Verify the subgrade is within ±0.4 ft (four-tenths of a foot) of required grade before starting, and protect pipes and conduits during stone placement and grading.

Place the ¾″ clean stone base on all slabs on grade, garage slabs, stoops, patios, and flatwork (except lead walks) at the depth and leveling tolerance shown on the Plan Documents.

Install the 6-mil vapor barrier over the stone without wrinkles, using the widest material practical. Lap adjacent sheets a minimum of 12″ and tape the laps; seal the barrier around all pipes and penetrations; cover all areas to receive a barrier; and remove standing water before placement.

ARTICLE 7 Footings & Foundations

Footings shall bear on firm, undisturbed soil or on engineered fill compacted per the geotechnical report. Do not place footings on rock, frozen ground, loose or organic fill, or in standing water; notify the CM in writing wherever bearing conditions differ from the Plan Documents.

Form or trench-form footings to the depth and width shown in the Plan Documents, within a tolerance of +/- ½″. The bottom of exterior footings shall be below the local frost depth and at the elevation required by the structural drawings.

On sloping sites, step footings so the top and bottom are level at each step; the bottom shall not slope more than one unit vertical in ten horizontal between steps unless the drawings provide otherwise. Run reinforcement continuously and lap it through steps, corners, and intersections.

Provide keyways or dowels between footings and stem walls, and between stem walls and slabs, where shown. Set anchor straps and anchor bolts per the Materials Schedule (Article 4.2), at the spacing, embedment, and corner offsets required by the plans and the jurisdiction, and secure them before the concrete takes its initial set.

Construct stem and foundation walls to the lines and elevations on the approved plans. Before placing concrete, verify that all under-footing and under-slab utilities are installed, inspected, and protected, and that any required footing or foundation drainage is in place and kept clear of concrete and debris.

ARTICLE 8 Reinforcement Placement

Place reinforcement per the Plan Documents, ACI 318, and the ACI Detailing Manual (MNL-66), free of rust scale, oil, or other bond-reducing coatings, and secure it against displacement during placement. Reinforcement with kinks or bends shall not be used.

Provide 1″ of cover at the top of the slab and position welded wire mesh at the center of the slab, lifted into place during the pour. Lap reinforcing steel per ACI 318 Class B (tension) laps; lap wire mesh one wire-spacing plus 2″ and tie. Provide support spacing per CRSI recommendations.

Do not embed conduit horizontally within the slab. Under-slab plumbing and electrical rough-in are installed beneath the slab by those trades under the Concrete Scope of Work; vertical penetrations through the slab shall be made with the sleeve inserts and penetration bushings specified in Article 4.3. Weld reinforcement only where the Architect/Engineer approves in writing, using weldable bars (ASTM A706) and procedures per AWS D1.4. Where permitted, synthetic fiber may replace wire mesh as secondary reinforcement at 1.0 to 1.5 lb/cu yd with written approval.

ARTICLE 9 Concrete Placement

Before placing, verify that all inspections are complete and inspect and approve formwork, reinforcement, sleeves, embedded items, and slab preparation. Batch, mix, and transport per ASTM C94.

Discharge all concrete within 1½ hours of mixing, or before the drum has completed 300 revolutions, whichever comes first. Do not place concrete after initial set, and do not temper partially set concrete; reject non-conforming loads.

Handle concrete to prevent segregation; limit free-fall to 5 ft (10 ft with a superplasticizer); deposit as close as possible to final position; and consolidate around embedded items. Do not place concrete when conditions prevent proper finishing and curing. Discharge no water into the forms.

Place concrete continuously between construction joints and consolidate each lift into the one below before initial set to avoid cold joints. Locate construction joints only where shown on the drawings or as directed by the CM. Where a construction joint or an unavoidable cold joint occurs, clean and roughen the hardened surface to expose sound aggregate, remove laitance and debris, and bond the new concrete per ACI 318, by roughening and wetting, or with a CONTRACTOR-approved bonding agent, with a keyway or dowels where the drawings require.

Furnish the Superintendent a numbered delivery ticket for every load showing the SUBCONTRACTOR’s name, project location, date/time batched, truck number, cubic yards, specified strength, slump, and mix-design number, with the lot/address of discharge.

ARTICLE 10 Finishing

Interior slabs: screed to an even surface within ACI tolerances, wood-float to compact and remove ridges and depressions, then steel-trowel to a smooth, even finish free of trowel marks and ready to receive flooring or cabinets. Interior control joints shall be zip-strip, located under plate-line walls.

Garage and monolithic slabs: hard steel-trowel finish, surface plane within ¼″ in 10 ft; slope ¼″ per foot to the overhead door; provide one control joint each direction.

Exterior flatwork: light, non-slip broom finish perpendicular to traffic, applied immediately after troweling; tool or saw control joints to at least ¼ of the slab depth; provide expansion joints at slab-to-slab junctures and where walks abut driveways; round transition edges with the proper tool, leaving no exposed aggregate.

Provide positive drainage of at least ⅛″ per foot away from the home; surfaces shall not pond water more than 3/16″, and shall not settle, heave, or separate more than ½″ from the structure. Strip and face exposed surfaces to a ½″ edge radius, with no honeycomb, knobs, spoils, or exposed reinforcement.

Joint Layout

Interior dwelling slabs: install a control joint wherever a slab exceeds 45′ in width or has an offset of 10′ or more. Lay all interior control joints under plate-line walls, regardless of plan location. Garage slabs receive two control joints, one in each direction.

Sidewalks: tool or saw control joints at no more than 5′ on center, and provide an angled control joint at each 90° turn.

Driveways: saw or tool control joints to one-quarter of the slab depth, in squares no greater than 12′ in either direction.

Expansion joints: provide fiber or 1″ × 4″ pressure-treated expansion-joint material at every walk-to-driveway juncture and at all slab-to-slab junctures.

ARTICLE 11 Tolerances

Basement and garage slabs shall meet ACI 117 floor flatness and levelness: flatness FF 25 and levelness FL 20, tested per ASTM E1155.

Verify overall building dimensions against the architectural, engineering, and shop drawings. The SUBCONTRACTOR bears all costs of excessive patching or preparation required to accept finished flooring where the work falls outside the ACI 117 F-values.

ARTICLE 12 Curing and Protection

Protect freshly placed concrete and cure per ACI recommendations and the applicable weather provisions of Article 5. The SUBCONTRACTOR is solely responsible for protecting its work until finished and cured; all costs to repair damage caused by failure to protect are borne by the SUBCONTRACTOR.

Begin curing as soon as finishing is complete and surface marring will not occur, and cure continuously for at least seven (7) days or until the concrete reaches 70% of its specified strength, by one of: continuous moisture (ponding, fog, or a waterproof sheet/blanket per ASTM C171); or a liquid membrane-forming curing compound applied per ASTM C309 at the manufacturer’s coverage rate. Do not apply a membrane curing compound to an interior slab that will receive flooring adhesive or a coating unless the product is compatible with, or removed before, that finish.

In hot or windy conditions, apply an evaporation retarder and start curing promptly to prevent plastic-shrinkage cracking; in cold conditions, cure and protect per Article 5. Where exposed exterior flatwork is to be sealed, apply a cure-and-seal or penetrating sealer per the manufacturer’s instructions after the cure period.

Do not remove formwork until the concrete has gained sufficient strength to support itself and imposed loads and to resist damage from removal.

ARTICLE 13 Testing and Inspection

Concrete testing, where required, is the SUBCONTRACTOR's responsibility, performed by a testing laboratory acceptable to the CONTRACTOR. A slump test may be called at any time. Provide the CONTRACTOR a list of suppliers and subcontractors on request, and written notice before changing or adding a supplier.

No concrete shall be poured until approved by all governing bodies; correct any inspection deficiency within 24 business hours. Should strength fall below the specified minimum, additional tests and coring may be required, with holes filled by dry-pack; the cost of additional testing and patching is at the SUBCONTRACTOR's expense.

ARTICLE 14 Inspection and Acceptance

Work that does not meet the specified finish, tolerances, drainage, or strength shall be removed and replaced at the SUBCONTRACTOR's expense, without exception. Acceptance follows the inspection and payment provisions of the Master Subcontractor General Requirements.

SUBCONTRACTOR	CONTRACTOR: Edgar Hughston Builder, Inc. (d/b/a Hughston Homes)
_____ Authorized Signature / Date	_____ Authorized Signature / Date
_____ Printed Name / Title	_____ Printed Name / Title
_____ Company Name	_____ Company Name