



TEXAS GENERAL LAND OFFICE
COMMUNITY DEVELOPMENT AND REVITALIZATION

HOUSING CONSTRUCTION
SPECIFICATIONS
(SINGLE FAMILY)

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Division 01 GENERAL REQUIREMENTS

1.1 Definitions

A. The Work- Contractor shall understand that the Work specified herein and shown on the drawings shall be a finished and working job as agreed upon in the construction agreement between the applicant and the contractor. All work shall comply with current Federal, State, Local building codes/ordinances, and State of Texas program requirements.

1.2 Execution, Correlation and Intent

A. Precedence - Addenda and Change Orders to Drawings and Specifications take precedence over the original Construction Documents. Should there be a conflict between any of the Construction Documents, the most stringent of the conflicting requirements will apply. Builder will consult with Program Vendor when conflicts arise.

1.3 Miscellaneous

A. Contractor to secure and pay for all permits and file all required drawings, specifications and certifications with the City and/or County agency having jurisdiction.

B. Contractor shall provide Green Building Standard certification for each house and secure and pay for required inspections.

C. Builder shall provide an accessible route, ramp, or where not possible, a wheelchair lift meeting ADA requirements to provide access to one (1) accessible exterior door entrance.

D. All materials used shall be new and of good quality. Builder shall provide products that comply with the Contract Documents, that are undamaged, and unless noted otherwise, that are new at the time of installation.

Division 03 CONCRETE

3.1 Formwork

A. Construct forms to the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location and grades. Provide for openings, blocking, inserts and other features required for the work.

B. Cleaning. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is to be placed.

3.2 Reinforcing Steel

A. Refer to Structural Drawings for exact specifications and comply with the specified codes and standards.

B. Clean reinforcement to be free from loose rust, mill scale, earth, ice, and other materials that reduce or destroy bond with the concrete.

C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.

D. Arrange, space, and accurately tie bars and bar supports together with 16-gauge wire to hold reinforcement accurately in position during concrete placement operations.

3.3 Beams

A. Refer to Structural Drawings for exact specifications

B. Exterior beams must have a minimum width at top of beam of 18 in. and may taper down to 14 in. at the bottom. Exterior beam must extend a minimum of 6 in. into undisturbed soil and shall be a minimum of 24 in. in height.

C. Interior beams must be minimum of 18 in., in height, and 16 in., in width at top and may taper to 8 in. at bottom. Interior beam to extend 3 in. below undisturbed soil.

3.4 Concrete

A. Concrete used for building slabs shall be 3,000 psi 28-day compressive strength with a 5 ½ in. maximum and 3 in. minimum slump.

B. All concrete is to be poured when the temperature is at forty degrees Fahrenheit (40 F) or above and rising. If the surface temperature is over ninety degrees Fahrenheit (90 F) steps to cool the surface such as watering will be taken as required.

C. All concrete slab on grade foundations shall be placed monolithically and be a minimum of 4 inches thick. Top of slab placed on grade must be a minimum of 6 inches above surrounding soil level.

D. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints.

E. Placing Concrete in Forms. Deposit concrete in forms in horizontal layers in a manner to avoid inclined construction joints. Consolidate all concrete placed in forms by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Maintain reinforcing steel in proper position continuously during concrete placement operations.

3.5 Finishes

A. Float Finish. Apply float finish to monolithic slab surfaces that are to receive trowel finish or other finishes. Consolidate the surface with power-driven floats, by hand-floating if the area is small or inaccessible to power units. Check and level the surfaces plane on the surface to a tolerance not exceeding 1/4 in. in 10 ft. when tested with a 10 ft. straight edge placed in the surface at not less than 2 different angles. Cut down high spots and fill all low spots. Uniformly slope surfaces to drains. Immediately after leveling, re-float the surface to a uniformly smooth, granular surface.

B. Trowel Finish. Apply trowel finish to monolithic slab surfaces that are to be exposed to view. After floating, begin the first trowel finish operation using a power-driven trowel. Consolidate the concrete surface by final hand troweling with a surface plane tolerance not exceeding 1/8 in. in 10 ft. when tested with a 10 ft. straight edge. Grind smooth surface defects which would telegraph through applied flooring system.

C. Broom Finish. Finishes that are exposed and subject to foot traffic shall receive a broom finish with a texture of plus or minus 1/16 in. or as designated in the Structural Drawings.

Division 06 WOOD, PLASTICS AND COMPOSITES

6.1 General

A. All work shall be erected plumb, true and in accordance with drawings and specifications. Work shall comply with all structural drawings, notes, and specifications. Excessively scuffed, scratched, dented or otherwise damaged wood must be replaced. All framing work to conform to local building codes.

6.2 Rough Carpentry

A. General

1. Lumber Grades: Conform to the latest grading rules of the lumber manufacturers association under whose rules the lumber was produced.
2. Provide weather protection for all lumber delivered to the job.
3. Schedule for Structural Nailing: See Structural drawings, notes, and specifications.
4. Treated Wood: Sill or base plates in contact with concrete foundations, exposed to exterior conditions, or within 18" of ground level shall be ACQ treated. For a pier and beam, or wood piling foundation, all lumber below the floor joists shall be treated. All stairs and decks shall be treated. All treated wood to be marked American Wood Protection Association (A.W.P.A. and stamp) or Western Wood Preservers Institute (W.W.P.I. and stamp). Mark shall be visible when installed. Only hot dipped galvanized or stainless-steel fasteners approved for use with ACQ treated lumber shall be used. No aluminum materials shall be used in direct contact with ACQ treated wood.
5. Carpentry: Carpentry shall include all rough and dressed lumber and all work in connection with material installation. The contractor shall do all cutting and framing as required by any other trade for the completion of construction. All work shall be done accurately, neatly and securely fitted in the most workmanlike manner in accordance with the working drawings.
 - a) All framing to be per drawings. Framing to include any furring or "cut-outs" necessary for installation of air conditioning and other MEP systems.
6. Lumber: The lumber shall be classified, and grade marked to the codes and requirements of the Manufacturer's Associations or Residential Standards of the particular region. Lumber shall be live stock, thoroughly seasoned, and well manufactured. Materials generally shall be free from

warp that cannot be corrected by bridging or nailing. All structural wood members shall be a minimum of # 2 SYP with a bending stress of 1050f.

7. Plywood: All plywood which has any edge or surface permanently exposed to the elements shall be exterior type. Plywood manufactured or originating in China shall not be used.

a) Exterior shear wall sheathing shall be 15/32" thick APA Exposure 1 rated CDX plywood or OSB. All other wall sheathing shall be 15/32" thick CDX plywood or OSB. Refer to structural drawings and specifications for installation requirements.

b) All roof sheathing to be 15/32" thick, CDX plywood or OSB sheathing with radiant barrier to meet APA Exposure 1 rating. Refer to structural drawings and specifications for installation requirements.

c) Floor sheathing shall be 3/4" thick plywood sheathing to meet APA Exposure 1 rated plywood. Glued and screwed; Refer to structural drawings and specifications for additional installation requirements.

8. All clips, straps, hangers, hold-downs, fasteners, and associated devices shall be galvanized, as manufactured by Simpson Strong-Tie Co. Inc or other TDI approved.

B. Beams:

1. All beams shall be made up of a number of 2x joists or engineer-specified Anthony power beam, or equivalent.

C. Joists:

1. Laterally support at ends and at each support by solid blocking except where the ends of joists are nailed to a header, band, rim joist, or adjoining stud. Solid blocking shall be no less than 1 1/2" thickness and shall match the depth of the joists.

2. Install joist hangers at each end of each ceiling joist. Verify light fixture centerline locations and joist/truss placement prior to installation.

3. Bridging must be #2 southern yellow pine or fir, graded and stamped (fir to be used in non-load bearing areas only). Refer to structural drawings.

D. Open Web Floor Joists:

1. Premanufactured wood open web floor joists able to support code-required live and dead loads. Provide as indicated on drawings. Submit shop drawings signed and sealed by a professional structural engineer licensed to practice in the State of Texas for review and approval. See structural for additional requirements.

E. Workmanship

1. Nail framing at 12" O.C. using # 8 screw shank, unless noted otherwise. See structural drawings and specifications for additional nailing requirements.

2. Remove all unused wood, including form lumber, scrap lumber, shavings and sawdust in contact with the ground. Leave no wood buried in fill or backfill.

6.3 Exterior Finish Carpentry

1. General: Use galvanized, stainless steel or treated nails as required. Install per manufacturer's instructions.
2. Fiber Cement Siding and Trim: Manufactured by James Hardie or equivalent; to be concealed nailed installation, unless noted otherwise; in compliance with TDI and structural design pressure requirements, where required. Shall include all required accessories for a complete installation.

Materials:

- a) Fascia Boards and Trim: 'HZ10' Hardie Trim, smooth finish, pre-primed. Texture finish may be substituted if smooth finish is unavailable.
 - b) Lap Siding: 'HZ10' HardiePlank, 6 1/4", smooth or textured finish, pre-primed.
 - c) Soffit: 'HZ10' HardieSoffit, continuous, vented, smooth finish, pre-primed. Provide metal screen at soffit openings.
 - d) Board and Batten Panels (option): 'HZ10' HardiePanel Vertical Siding with 'HZ10' Hardie Trim battens, smooth or textured finish, pre-primed.
 - e) Shakes at Porch Gable (option): 'HZ10' HardieShingle, half-round, pre-primed.
 - f) Porch Soffit: 'HZ10' HardiePanel, smooth finish, pre-primed.
3. Building Wrap: Dupont Tyvek© HomeWrap© or ThermaWrap© or similar weather resistant barrier on all exterior walls (ensure compliance with chosen Green Standard).
4. Trim and Decorative Millwork: Installed in compliance with TDI requirements;
- Shall include all required fasteners and accessories for complete installation.
- a) Column Wrap: Prefabricated; Design, as indicated on drawings;
 - b) Louver / Gable Vent: Design, as indicated on drawings; Provide metal screening at openings.
5. Treated Wood Decking: Include all accessories for a complete installation. Installed in compliance with manufacturer's instructions and TDI requirements.
- a. All stair risers shall be equal height on all exterior steps. Maximum height of riser shall be 7 3/4" The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8" (Landings shall have a minimum depth in direction of travel shall not be less than 36 inches).

- b. All exterior wooden porches, rails, stairs, ramps, etc. shall NO LONGER be painted (as of 06/12/19).
- c. They may be stained with Sherwin Williams SuperDeck # SW3049 Monterey Tan deck stain or equivalent (non-tinted stain may also be used over natural wood).
- d. The horizontal surfaces shall have a sand additive or non-grip texture applied. This refers to any surface that will be walked upon. Handrails are not to have sanded texture applied, but they may be stained.
- e. The rest of the surfaces may be stained, at the builder's preference, if that is more economical with respect to item 'b.'

6. Decorative Rail: (Where indicated) Newell posts, top, and bottom rails and balusters, treated wood; design as indicated on drawings.

6.4 Interior Finish Carpentry

A. General:

- 1. Provide weather protection for all millwork delivered to the job.
- 2. Inspect finish materials (trim, doors, etc.) to ensure that no sub-grade, defective or machine marked pieces are installed. Use one piece for length wherever possible.

B. Window Stool and Apron: 3/4" thick white pine stool with gypsum board jamb; 1x4 apron. To be painted to match door wood trim.

C. Shelving:

- 1. Closets: 1 1/2" diameter wood rods, 3/4" thick wood shelving with 3 4"x1 12" solid wood edge banding, to be painted.
- 2. Utility Room: Place one row of 3/4" thick wood shelving with 3 4"x1 12" solid wood edge banding above washer/dryer per interior elevations, to be painted.

D. Cabinets

- 1. All bathroom cabinets and doors to be face frame type stain-grade, plywood / solid wood, pre-finished or approved equivalent. Color to be per pre-selected finish schedule.
- 2. All kitchen cabinets and doors to be face frame type stain-grade, plywood / solid wood, pre-finished or approved equivalent. Stain color to be selected by Owner from pre-selected finish schemes.

* NOTE: NO PARTICLE BOARD SHALL BE EXPOSED TO THE ATMOSPHERE*

- 3. No nail or screw holes or other fastening shall be visible on the exterior.
- 4. Toe bases to be 3 1/2" high, 3" deep;

5. The Cabinet Fabricator and General Contractor shall be responsible for all required appliance “cut-outs” taken from the manufacturer's installation instructions and templates, as selected.

E. Hardware:

1. Hinges: 1/2" overlay concealed hinges. Provided by manufacturer, chrome or brushed chrome finish.
2. Door Catches: As provided by manufacturer, chrome or brushed chrome finish.
3. Door and Drawer Pulls or Knobs: To be selected by Owner from pre-selected list.

F. Countertops:

1. Kitchen: Plastic laminate, matte finish by Formica or equal counter, adhered to 3/4" particle board substrate made with exterior glue and binders containing no urea formaldehyde. With 4" high integral backsplash with roll edge. Side splash as required. All laminate to be handled and installed in accordance with the Manufacturer's instructions and recommendations. Waterproof around sink cut out perimeter top, edge, and bottom. Contractor to provide Owner with pre-selected color samples for color selection.

2. Bathroom Vanity: Vanity top with integral sink, 1/2" thick solid polymer material adhesively joined with inconspicuous seams; standard edge details with integral bowl. Provide coved backsplash and side splashes.

Division 07 THERMAL AND MOISTURE PROTECTION

7.1 Sealants

A. Materials: One part 100% liquid polymer, polysulfide or acrylic base compound, non-sagging, non-staining, gun consistency. Rod stock backup shall be flexible, closed cell, expanded polyethylene round rodding 1-1/3 times the joint width in diameter conforming to Federal Specifications HH-f-341, Type 1, Class A and B. Color to be manufacturer's standard and chemically compatible with substrate per manufacturer's recommendation. Sealant to have a minimum 20-year warranty.

B. Location: Provide sealant at all joints and recesses in exterior and interior construction where required to prevent infiltration of water, moisture, air, sound, and light. Place continuous bead of acoustical sealant between exterior sill plate and floor.

C. Application: Before applying sealants, all surfaces shall be absolutely clean of dirt, grease, loose material, and foreign matter. Apply primers and sealants in strict accordance with manufacturer's printed instructions. All sealants in exposed or visible locations to be tooled smooth as recommended by sealant manufacturer. All window tops, sides and bottoms of door thresholds to have full bed of sealant. Complete sealant installation before the final coat of paint is applied.

7.2 Insulation

A. General: All building insulation to have a flame-spread rating of 25 and a smoke-developed rating of 50.

B. Roof/Ceilings: Use formaldehyde free, R-38 fiberglass batt or blown-in mineral wool insulation material, ASTM E-84, Class A, non-combustible. Provide insulation baffles at roof to accommodate venting.

C. Exterior Walls: Use formaldehyde free, unfaced, R-13 fiberglass or mineral wool batt insulation material for 2x4 walls (R-19 batt insulation material for 2x6 walls), ASTM E-84, Class A, non-combustible.

D. Underfloor (Elevated House): Use formaldehyde free, unfaced, R-19 fiberglass or mineral wool batt insulation material, ASTM E-84, Class A, non-combustible.

E. All voids around windows, exterior doors, and wall penetrations to be filled with high-density foamed-in-place thermal insulation. Do not use products containing Urea Formaldehyde.

F. Use baffles around all heat sources and at the plywood deck between the joists.

7.3 Roofing

A. Warranty: Contractor warranty shall include all materials and labor to repair any defects or leaks that develop and repair or make good any damage caused by leaks and roof repairs for a period of one (1) year from date of substantial completion. Manufacturer's warranty shall be 30 year "no dollar limit" warranty.

B. Shingle Roof:

1. 30-year ELK, Celotex or GAF or comparable alternate composition Architectural shingles, fiberglass-based asphalt shingles, ASTM D3161, Class F with Type I – Self Sealing; UL Rating of A and Wind Resistance Label to meet designated structural wind design pressures; 220 minimum lb. / square; square type; installed per manufacturer's details; must be approved by TDI where required.
2. All valleys to be woven or closed-cut to comply with windstorm guidelines and per manufacturer's recommendations.
3. Nail the roof deck with 8d ring-shank nails. 8d ring-shank nails must be at least 0.113-in. diameter and 2-3/8-in. long. Documentation: Photograph the fastener package or the nails prior to installation.
4. Install a 4-in.-wide (nominal) roof deck flashing tape over all roof sheathing panel seams. Documentation: Photograph the tape installation.
5. Cover the deck with a #30 felt or an equivalent synthetic underlayment. Note: Attach underlayment with button cap nails at 6 in. o.c. along the laps and 12 in. o.c. spacing, vertically and horizontally, between the laps. Documentation: Photograph the underlayment installation over the tape showing the button cap nail spacing (nails, not staples!).
6. Install drip edge over the underlayment at rakes and eaves and fasten at 4 in. o.c. staggered. Documentation: None needed, will be certified at the Final Inspection

C. Specifications:

1. 8d ring-shank nails must be at least 0.113-in. diameter and 2-3/8-in. long.

2. #30 felt or synthetic underlayment equivalent must be an ASTM D226 Type II or ASTM D4869 Type IV underlayment or a synthetic underlayment equivalent that has an ICC approval as ASTM D226 Type II and meets ASTM D4869 section 8.6 water shower test.
3. Button cap nails must be annular-ring or deformed-shank roofing fasteners with minimum 1-in.-diameter caps.
4. Drip edge must extend ½ in. below sheathing and extend back on the roof a minimum of 2 in., overlap 3 in. at joints, meet code requirement for metal gauge, and be fastened at 4 in. o.c., staggered.

7.4 Sheet Metal

A. Materials: Sheet metal shall be 26-gauge unless noted otherwise AK Steel zincgrip steel, or equal. Seams shall be locked and soldered with 50% pig lead with non-corrosive flux. Joints shall be lapped 6” and bedded in plastic roofer's cement FS-SS-C-153. Fasteners in contact with galvanized iron shall be galvanized, or cadmium plated steel screws, or galvanized or cadmium plated strong-hold type nails. All sheet metal work shall conform to SMACNA. Sheet metal flashing required at all roof edge, valleys, tie-ins, crickets, wall/roof intersections, and all exterior doors and window heads.

B. Types

1. Roof Edge Flashing and Drip Edges: Angled. 28-gauge galvanized steel;
2. Roof Valleys and Tie-ins: 26-gauge galvanized steel.
3. Windows and doors: Z-bar flashing or equivalent installed per manufacturer’s instructions.
4. Crickets: 24-gauge galvanized steel.
5. Gutters and Downspouts:
 - a) Standard K-Style gutter: 5" or 6” wide, aluminum, prefinished OR
 - b) Standard half-round gutter: 5" or 6” wide, aluminum, prefinished.
 - c) Provide a minimum of 4" diameter downspout, aluminum, prefinished.
 - d) Provide splash block at each downspout.

7.5 Roof Accessories

A. Roof Vents: Ridge vents and other roof vents per architectural drawings; Non-combustible construction; install 1/8" metal screen at all vent openings; must meet structural requirements and be TDI approved; ridge vents are to be shingle over type.

7.6 Damp-proofing under Slabs

A. Floor slab damp-proofing membrane (Vapor Barrier): 6 mil. polyethylene film, unless otherwise noted, “Visqueen” or equal, installed overfill at floor slab of enclosed building area locations.

B. Lap minimum 24 in. with top lap in the direction of spreading concrete. Extend vapor barrier into beam trenches 6 in. below haunch.

C. Prior to placing concrete, inspect vapor barrier to ensure there are no holes or tears.

Division 08 OPENINGS

8.1 General

A. All doors and windows shall be inspected to ensure that they are square, plumb, and accurate before installation and comply with size, thickness, and design as shown in the Construction Documents and Schedules and meet local codes. All scheduled doors shall be installed to be plumb, level, and square and operate freely, but not loosely, and shall be adjusted to function properly. Doors shall be free from rattling when in latched position.

8.2 Doors

A. Standards: All wood doors and window shall conform to standards set by AWI (Architectural Woodwork Institute) and NWMA (National Woodwork Manufacturer's Association). Provide one-year minimum guarantee against all defects.

B. Schedule: Reference Door Schedule on plans for sizes, types, locations, etc.

1. Exterior Doors: See opening schedule. Insulated fiberglass. All exterior doors must be fabricated and installed to meet the engineered design pressures and must be an approved TDI product, when appropriate. Per program, design pressure shall be a minimum of +/- DP50 or higher designation. Refer to structural drawings. Energy Star qualified for the proper climate zone.

a) Verify local code and ordinances and provide "Impact" resistant exterior doors, where required by code.

b) Vision Glass: (Where indicated) factory glazed 1" thick Low-E insulated glass units comprised of 2 layers of glass - provide "Impact" resistant glass where required by code. The use of "lite window panel doors prohibited on residential housing (regardless of plan) unless specifically required by code.

2. Interior Doors: 2 Panel, 1 3/8" thick Masonite, H/C Smooth. See opening schedule.

C. Weather-stripping: Provide on all exterior doors. Shall be TDI approved material.

D. Threshold: At least one exterior door shall have aluminum, 2-piece interlocking threshold to meet ADA requirements. Coordinate with door bottom. All threshold to be mortar filled.

E. Finish Hardware

1. Contractor shall completely install finish hardware as required, without damaging cabinetry and door finishes and in accordance with manufacturer's instructions.

2. Contractor will be responsible for all hardware delivered to the job site. Hardware must always be protected from damage prior to and after installation.
3. Exterior Hardware: All exterior door hardware shall comply with the specific TDI approved door units and meet ADA requirements. Include door locks, hinges, door stops, weather-strip, peepholes, and threshold. Provide compressible door seals with rubber bottom gasket where sound mitigation is required.
4. Interior Hardware: Shall meet ADA requirements. Include door locks, hinges and door stops. Chrome or brushed chrome finish. Bedrooms and bathrooms to have privacy locksets. All other doors shall have passage locksets.
5. Install lever type door handles meeting ADA requirements on all doors.
6. Door pulls shall be lever type, operable with a closed fist meeting ADA requirement.
7. Keying: All entrance locksets to be keyed alike (including deadbolts) Provide minimum two (2) keys for each lock.

8.3 Windows

- A. Standards: All Windows must be fabricated and installed to meet the engineered design pressures and must be an approved TDI product, where appropriate. Per program, design pressure shall be a minimum of +/- DP50 or higher designation. Refer to structural drawings. Installation shall be according to details and manufacturer's recommendations to assure a weather-tight fit. All frames will be installed plumb, level and square to ensure proper functioning with regard to sliding, locking and weathering. Reference window schedule on plans for sizes, locations, etc. If there are discrepancies between the plans and specifications, the specifications will rule. Manufactured by Jeld-Wen or equal substitute.
- B. Verify local code and ordinances and provide "Impact" resistant windows, where required by code.
- C. Materials: Single hung, operable type or fixed type vinyl windows, insulated frame with factory glazed 5/8" thick Low-E insulated glass units comprised of 2 layers of glass - provide Impact resistant glass where required by code. Windows shall be Energy Star rated for the proper climate zone. Provide impact resistant windows equal to Krestmark 4000, minimum STC 30 Rated where Sound Mitigation is required.
- D. Each open area of operable windows must be supplied with removable screens covering the operable area. Screen material is not to be less than 8-8x16 mesh per inch.
- E. All operable windows must have a security device/lock.

Division 09 FINISHES

9.1 Gypsum Board

- A. Materials: Gypsum wallboard, tapered, manufactured by USG or equal.
 1. Ceilings: 1/2" thick, ANSI/ASTM C30, painted gypsum board with tape and accessories required for complete installation.

2. Walls: 1/2" thick ANSI/ASTM C30, painted gypsum board with perforated tape and accessories. (Bathroom wall shall be reinforced with solid 2x12 lumber for potential installation of ADA grab bars. Refer to floor plans for reinforced wall locations.).

3. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/4 inch (6.35 mm) in 4 feet (1219 mm) in any direction.

4. Bathrooms, Kitchen, Washer / Dryer closet (all wet areas), use moisture resistant gypsum board, ANSI/ASTM C630. Hardi-Backer, or equal, shall be installed behind ceramic tile.

5. Fire Separation: 5/8" Type-X fire code gypsum wallboard at all walls and ceilings adjacent to habitable spaces at garages and accessible space under stairs.

6. Nails: 1 3/8" annular ring cement coated.

7. Corner and edge beads: USG or approved equal; quarter round or 90-degree corner bead;

8. Tape and joint cement: USG or approved equal.

B. Installation: Install at right angles to framing members with end joints staggered and neatly fitted. Edges shall abut over supports. Tape and float joints to be level. Apply light texture shot or sprayed. Level 4 finish - orange peel knock down for ceiling and walls. No holes over 1/2" in diameter will be permitted to be floated. Damaged area shall be removed, and a large patch of gypsum wallboard shall be reinstalled, properly nailed, and floated.

9.2 Flooring: See Room Finish Schedule.

A. Carpet and Pad: 28 oz. / Sq.Yd. with pad to be 6 lb. / Cu.Ft. minimum with all required accessories. Color pre-selected as indicated on Material Selection sheet.

1. Re-stretch carpet for a period of one (1) year from date of issuance of Certificate of Occupancy.

2. Nails must be countersunk.

B. Vinyl Plank: Armstrong "LuxePlank" or Mannington "Nature's Path"; 1/8" thick x 36" length plank tile, or equal. Color pre-selected as indicated on Material Selection sheet.

C. Transition Strip: Provide standard 1" sloped vinyl transition strip or reducer between all dissimilar flooring materials (avoid the bull-nosed style and any that has abrupt change of level).

D. Ceramic Tile

1. General:

a. Related documents: Hurricane Harvey Housing Construction Specifications, ANSI 108, Hurricane Harvey Housing Design Standards and IRC 2012 (or later).

b. Scope: Furnish all labor and materials to properly execute tile work.

E. Materials:

1. Glazed Floor and Wall Tile: ANSI A137.1, and as follows:
 - a. Stone look porcelain or ceramic or equivalent product.
 - b. Moisture Absorption: 0.5 to 3.0 percent.
 - c. Size and Shape: 12-inch square or 13-inch square.
 - d. Thickness: ¼ inch to 3/8 inch.
 - e. Edges: Square for walls, cushioned at floors.
 - f. Surface Finish: Matte Glazed with "Plus Finish" for ADA compliance at floors.
 - g. Colors: To be selected from manufacturer's standard range.
 - h. Trim Units: Matching base, in sizes coordinated with field tile.
 - i. Porcelain Tile Floor: Thin set to wall with organic adhesive ANSI – A136.1 Type 1
 - j. Tile Base: Thin set to wall with organic adhesive ANSI – A136.1 Type 1

F. Installation of Tile:

1. Install tile over concrete foundation using thin-set method directly to concrete foundation.
2. Install tile over wood subfloor according to ANSI 108, including suitable backer board and waterproof membrane.
3. Do not use grout between fixtures and tile. Fill these joints with sealant with color to match grout allowing for movement.

9.3 Paint and Coatings

A. General:

1. All paints, coatings, and finishes are to be applied in strict accordance with manufacturer's directions and carry a manufacturer's warranty.
2. Before commencing work, the Contractor shall make certain that the surface to be covered is in proper condition to receive the finish specified. The coverage of the surface shall be held to denote the acceptance of the surface.
3. Ceilings shall be flat white or off-white paint color.
4. All interior spaces are to be primed and painted as scheduled. Interior painting will not exceed a total of three paint colors; one wall color, one ceiling color, and one trim color. Colors to be selected from pre-selected color schemes.

5. Exterior surfaces to be primed and receive minimum of two top coats of paint. Colors to be selected from pre-selected color schemes.

B. Material: All paint, primer, enamel, stain, shellac, varnish, filler, and thinners shall be manufactured by Sherwin Williams, Monarch, PPG Pittsburgh or approved equal.

C. Typical Paint Systems:

1. Exterior Paint:

a. Fiber Cement Siding and Trim: Prime - 1 coat on all surfaces, equal to Sherwin Williams ProBlock (latex) B51W20 at 4 mils wet; 1.4 mils dry. Primer is not necessary on paint-ready Hardiplank; Finish - 2 coats equal to Sherwin Williams A-100 Latex Satin A82W151 at 4 mils wet; 1.5 mils dry per coat.

b. Wood:

i. Painted: Prime - 1 coat equal to Sherwin Williams ProBlock (latex) B51W20 at 4 mils wet; 1.4 mils dry. Finish - 2 coats equal to Sherwin Williams A-100 Latex Satin A82W151 at 4 mils wet; 1.5 mils dry per coat.

ii. Stained: Equal to Sherwin Williams Deck Scapes Exterior Acrylic Latex Solid Deck Stain. Comply with manufacturer's directions.

iii. Treated wood shall be allowed to dry sufficiently to allow paint or stain application.

iv. All walking surfaces to be painted or stained with a non-skid additive equal to H&C Sharkgrip Slip Resistant Additive.

c. Plywood: Prime - 1 coat on all surfaces, equal to Sherwin Williams ProBlock (latex) B51W20 at 4 mils wet; 1.4 mils dry. Finish - 2 coats equal to Sherwin Williams A-100 Latex Satin A82W151 at 4 mils wet; 1.5 mils dry per coat.

d. Metal: All exposed flashing, roof jacks, and vents; Prime - 1 coat equal to Sherwin Williams ProCryl B66W310 at 7 mils wet; Finish - 2 coats equal to Sherwin Williams Zero VOC Acrylic B66W611 at 9 mils wet; 3 mils dry per coat. For primed metal, touch up existing prime coat prior to finish coat. Vent piping exposed above roof shall be painted to match color of roof shingles.

e. Soffit Board: See fiber cement finish above. Finish coats shall be spray applied on perforated soffit boards.

f. A color palette consisting of three (3) to four (4) colors will be used on exterior, for siding, trim and other components. Colors will be selected by Owner from pre-selected color palettes provided by General Contractor.

g. Exterior paint must carry no less than a 15-year warranty.

2. Interior Paint:

- a. Gypsum Wall Board: Primer - 1 coat equal to Sherwin Williams ProBlock (Latex) B51W20 at 4 mils wet; 1.4 mils dry. Finish - 2 coats equal to Sherwin Williams ProMar 200 Zero VOC B30W2651 at mils wet; 1.6 mils dry per coat, flat finish.
- b. Wood: Primer - 1 coat equal to Sherwin Williams ProBlock (Latex) B51W20 at 4 mils wet; 1.4 mils dry. Finish - 2 coats equal to Sherwin Williams SoloGloss B21WJ8651 at 4 mils wet; 1.4 mils dry per coat, semi-gloss finish.
- c. Interior Doors and Trim: See wood finish above, semi-gloss finish.
- d. Metal: Primer - 1 coat equal to Sherwin Williams ProCryl B66W310 at 7 mils wet; 3 mils dry. Finish - 2 coats equal to Sherwin Williams Zero VOC Acrylic B66W611 at 9 mils wet; 3 mils dry per coat.
- e. A color palette consisting of two (2) colors will be used on interior, for walls, trim and other components. Colors will be selected by Owner from pre-selected color palettes provided by General Contractor.
- f. Interior paint must carry no less than a 10-year warranty.

Division 10 SPECIALTIES

10.1 Bathroom Accessories

- A. Bathroom accessories shall be ASI, American Standard or other approved. All bathroom accessories shall be supplied by one manufacturer.
- B. Towel bars, two (2), 18" long, chrome or brushed chrome finish;
- C. Toilet tissue holder, single roll, chrome or brushed chrome finish;
- D. Mirror, size as indicated on drawings;
- E. Tub/Shower Enclosure: Install new white fiberglass shower/tub enclosure able to receive ADA approved grab bars as indicated on plans. Include new ramp overflow and drain with stop valve and water connections. Valve must be washerless and high-quality chrome-plated brass unit with dual control, lever type plumbing fixture handles. Install plumbing pipe access. Provide shower curtain rod, chrome or brushed chrome finish;
- F. Grab Bars: Provide (when required), ADA compliant grab bars at accessible tub and toilet, as indicated on drawings. Chrome or brushed chrome finish.
 - 1. For HC-2 condition, provide ADA compliant grab bars for tub and toilet;
 - 2. For HC-3 Condition provide ADA compliant tub with seat, grab bars for tub and toilet, and hand-held shower wand;
 - 3. For HC-4 condition, provide ADA compliant roll-in shower with fold down seat, grab bars for shower and toilet and hand-held shower wand;

G. Faucets: ADA compliant lever handles, washerless, chrome or brushed chrome finish;

Division 11 EQUIPMENT

11.1 Kitchen

A. All equipment shall be Energy Star rated. Equipment items to be provided according to the following selection list (Residential ranges are not available as Energy Star):

1. Range: 30" electrical range with smooth or coil tops. Gas range may be provided as long as gas service to lot is existing and must have prior approval by Owner.
2. Microwave Unit: with integral exhaust fan and light; exhaust to exterior.
3. Refrigerator: 18 cubic foot minimum size unit with an ice-maker.
4. Sink: 2 equal sized compartments, 22" x 33", 6" deep minimum, stainless steel finish.
5. Dishwasher and Garbage Disposal: Install 24" built-in, multi-stage dishwasher; 1/2-HP continuous feed garbage disposal.

11.2 Laundry

A. Provide hook-up and venting for electric clothes washer and dryer as shown on plans. Dryer exhaust vent connection shall be to exterior. Clothes washer and dryer are not in the contract, not to be supplied.

Division 14 CONVEYING EQUIPMENT

14.1 Vertical Platform Wheelchair Lifts

A. Provide manufacturer's standard pre-engineered lift system, where designated on drawings, complete with all required accessories. Equipment shall be rated for use in a marine environment. Manufactured by Inclinator - Model VL or Savaria - Model V1504, with straight or 90-degree turn cab (as required), or equal and in compliance with TDI requirements.

B. Equipment must comply with the ASME Code A17.1 or A18.1, as applicable and must be inspected by a QEI-1 certified inspector after installation, per Texas Health and Safety Code Section 754.0141. Provide a copy of the inspection report to the dwelling owner.

Division 22 PLUMBING

22.1 Codes and Regulations

A. All work shall be performed by a licensed Plumbing contractor and conform to the requirements of the International Plumbing Code, City, County, and State Plumbing and Health Codes and/or Local Ordinances, most recent edition.

B. Contractor shall secure and pay for all permits and file all necessary drawings with the City and/or County agency having jurisdiction.

22.2 Piping

A. Soil waste and vent piping shall be Schedule 40 PVC as required by Code. All water piping (both hot and cold) shall be CPVC, PEX (or approved equal) and shall be sized and installed so that no running water noise is audible in piping system. All hot and cold-water piping shall be installed inside of building insulation to prevent freezing. Where this is not practical, piping is to be insulated - minimum R-3.5. Swing joints, expansion loops, and offsets shall be provided as necessary to allow for expansion of piping.

1. Where existing natural gas service exists, and service is to remain, extend gas line to range and clothes dryer locations with proper type pipe and shut-off valves. Where not to remain, utility company shall remove gas meter and gas line(s) to edge of property and cap service, U.N.O.

2. LP Gas Service - Where provided install 120-gallon tank minimum on concrete pad with gas lines and shut-off valves to locations listed above. Locate and install per code requirements.

B. Provide heavy brass hose-bibs with insulated cut-offs, mount with handles 4" from wall in locations as shown and noted on documents. Do not locate hose bib on front elevation of house.

C. Provide escutcheons for exposed piping passing through floors, walls, partitions, and ceilings. Chrome or brushed chrome finish.

D. Contractor shall furnish and install all plumbing fixtures required including all items such as traps, supply tubing, stop and basin cocks, etc. All fixtures shall be furnished and installed without damage or replaced in case of damage.

22.3 Water Heater

A. One 40 gallon electric or gas - glass lined, quick recovery, with a minimum five (5) year warranty. Provide 2-1/2" galvanized drain pan. Energy Star rated; minimum 0.93 EF (electric), 0.61 EF (gas).

22.4 Fixtures

A. Sinks, lavatories, water closets, bathtubs, stall showers (where required), shower heads, fittings, trim, to be coordinated with Owner. Install lever type plumbing fixture handles. Chrome or brushed chrome finish accessories.

B. Toilets should be WaterSense-compliant (1.6 gallons per flush), elongated; 17"-19" floor to bowl rim height, including the seat; Chrome or brushed chrome finish handle.

C. Bath: Fiberglass pre-fabricated tub (30" x 60") or shower (where required), as indicated on drawings.

D. Sink faucet with aerator should be WaterSense-compliant (2.0 gallons per minute); Chrome or brushed chrome finish.

E. Showerheads to be WaterSense-compliant (2.0 gallons per minute); Chrome or brushed chrome finish.

Division 23 HEATING VENTILATING AND AIR CONDITIONING

23.1 Codes and Regulations

A. All work shall be performed by a licensed HVAC contractor and conform to requirements of all applicable codes and ordinances.

B. Contractor shall secure and pay for all permits and file all necessary drawings with the City and/or County agency having jurisdiction.

23.2 General

A. Locations of outlets will be coordinated with lights and structure on the basis of appearance.

B. Controls: Honeywell programmable thermostat or equal approved substitute; installed so that highest operable part no higher than 48" AFF.

C. Testing, balancing, and adjusting: Balance system and test performance and operation of all equipment and make adjustments or corrections required for proper operation.

D. Wiring: Furnish and install low voltage control wiring and high voltage wiring, including connections to equipment.

E. Guarantee: Standard One (1) year for parts and labor. In addition, furnish a minimum of five (5) year manufacturer's warranty for compressor, condenser coil, and heat exchanger.

F. Return Air Ducts: Insulate with sound attenuating material.

G. Piping: Refrigerant piping to be copper. Primary condensate drain to be 1" PVC. Run primary drain to nearest active trap of plumbing fixture. If no active trap is nearby, then line will be run to hub drain with a trap primer. Auxiliary drain piping to be 1" plastic. Provide 2" deep drain pan under equipment with auto cut off float switch.

H. Foundation and Vibration Isolation: Furnish and install angles and vibration isolators necessary to prevent objectionable noise and vibration. Verify locations of all equipment.

I. Design Conditions: Listed below are for determining minimum requirements for system performance.

ART 210-62	Summer	Winter
Outside	95 F DB-80.0 F WB	20F
Inside	75 F DB-63.5 F WB	75F

J. All equipment shall be set on suitable foundations and shall have vibration isolation to prevent noise. Equipment installed outside shall be set on pads at base flood elevation. All equipment shall have motor starters.

K. A complete charge of refrigerant and oil shall be maintained throughout the warranty period.

L. After the system has been completely installed, provide necessary testing, adjusting, and operating to place the system in satisfactory operating condition. After final inspection and approval, the system shall be guaranteed against defective workmanship and materials for a period of one year.

M. Exterior A/C compressor unit shall be strapped or bolted to a permanent support platform in accordance with TDI requirements.

23.3 Air Conditioning/Heating Equipment

A. Air-conditioning units shall be minimum 14.5 SEER with gas, heat or electric heat pump HSPF 8.2, or ≥ 80 AFUE furnace, sized in accordance with ACCA Manual J and the entire system sized in accord with the Green Standard certification which shall take precedence over suggested minimum recommendations. All exterior mechanical equipment must be secured to meet TDI requirements, where applicable.

23.4 Duct Material

A. Supply: flex duct. Minimum R-3.5 insulation wrap.

B. Return: Framed plenum. Flex duct.

C. Registers: Prefinished metal, opposed blade, white.

D. Insulation: As required by International Energy Code, most recent adopted edition.

23.5 Ventilation Equipment

A. Exhaust fan in bathrooms with no operable window: Provide exhaust fan/light/heat combination adequate for room size per manufacturer's recommendation. Use Nu-Tone or equal substitute approved by designer and meeting TDI requirements. Fan shall have CFM capacity as evaluated by TDI and be Energy Star rated. Exhaust through roof except on two-story house exhaust through wall. Refer to Electrical Legend.

Division 26 ELECTRICAL

26.1 Codes and Regulations

A. All work shall be performed by a licensed electrician and conform to requirements of National Electrical Codes, State and Local Codes and Ordinances and Architectural Standards.

B. Contractor shall secure and pay for all permits and file all necessary drawings with the City and/or County agency having jurisdiction.

26.2 Circuits and Wiring

A. Contractor shall size all conductors, fuses, and switches as required by loads and provide space for two (2) additional circuits. Label all circuits in the panel box.

B. All 220-volt circuits shall be copper. All switch legs and 110-volt branch circuits shall be copper, G.E. multi-conductor, non-metallic "Romex," or equal. All joints shall be code approved. Circuit voltage drop shall conform to applicable codes.

****NO ALUMINUM WIRING SHALL BE USED BEYOND THE PANEL (INTERIOR BRANCH CIRCUITS OR SWITCH LEGS)****

****ALL INTERIOR ALUMINUM WIRING SHALL BE REPLACED IN ANY REHAB PROJECT (SWITCH LEGS, BRANCH CIRCUITS) ****

ALUMINUM WIRING MAY **ONLY** BE USED FROM THE METER TO THE SERVICE PANEL

- C. Provide separate circuits for refrigerator, dishwasher w/ GFCI, range, and microwave oven/vent.
- D. Provide main power disconnect switch installed as required by code.
- E. Provide interior breaker panel enclosure with door and latch and, where required by code, provide with a main breaker. Enclosure shall be located 48" above the finish floor (maximum) to the centerline of the highest breaker.
- F. Install GFCI device within 72" of any water source as specified in current IRC, to include dishwasher and washer.
- G. GFCI receptacles shall be labeled in accordance with NEC 406.3.

26.3 Fixtures

- A. Switch Plates: White faceplates, highest control no higher than 48" AFF, except as noted in documents. Switch plates should be set as close to door frame as practicable.
- B. Convenience Plates: White faceplates, except as noted in documents.
- C. All duplex outlets to be installed such that the lowest operable part is no lower than 15" AFF, except as noted in documents. Color to match faceplates.
- D. Fixtures: Energy Star Rated; Chrome or brushed nickel finish, unless noted otherwise. Refer to Electrical Legend for required fixtures description.
- E. Switches: Typical wall switch to be provided. Color to match faceplates.

26.4 Miscellaneous

- A. Television: provide RG-6 shielded cables. Coordinate home run location with Owner. Provide faceplate; color to match typical faceplates.
- B. Telephone: Provide CAT-5 wiring. Coordinate home run location with Owner. Provide faceplate; color to match typical faceplates.
- C. Smoke Detector Alarm: Provide where required by code. Product of Gentex # GN-303 Series or other approved. Alarm devices shall be interconnected and hardwired 120VAC with 9VDC battery back-up and in compliance with UL 217, UL 2034 listing and NFPA 72. Device shall be installed per governing authority building codes and TDI requirements.

- 1. Note: If house is occupied by a person(s) with audio/ visual impairment, each bedroom occupied by impaired person must have an audio/ visual alarm connected to and activated by the smoke alarm installed in the hall. Provide smoke detector/ alarm with 90db horn and flashing

strobe light - Gentex # 7109-CS-C or other approved. Alarm devices shall be interconnected and hardwired 120VAC with 9VDC battery back-up and in compliance with UL 217, UL 2034 listing. Device shall be installed per governing authority building codes and NFPA 72.

D. Combination Smoke Detector / Carbon Monoxide Detector Alarm: Provide where carbon monoxide detectors are required by code. Product of Gentex # GN-503 Series or other approved. Alarm devices shall be interconnected and hardwired 120VAC with 9VDC battery back-up and in compliance with UL 217, UL 2034 listing and NFPA 72. Device shall be installed per governing authority building codes and TDI requirements.

E. Contractor shall be responsible for fees associated with disconnecting utilities.

Division 31 EARTHWORK

31.1 Termite Control

A. All work shall be performed by a licensed contractor and conform to requirements of all applicable codes and ordinances.

B. Provide termite control by treatment of soil with termiticides. Minimum one (1) year duration.

31.2 Grading

A. Finish Grade at house foundation shall provide positive drainage away from structure and shall start a minimum of 6 inches below finish floor at slab on grade or a minimum of 6 inches below pier footings for elevated floor.

B. Grading below elevated floor slab shall provide positive drainage away from house footprint and prevent pooling under the house.

Division 32 EXTERIOR IMPROVEMENTS

32.1 Turfgrass Sod

A. Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Provide minimum two pallets of grass (site zone appropriate); Install at perimeter of foundation or house footprint where elevated.

End of Specifications