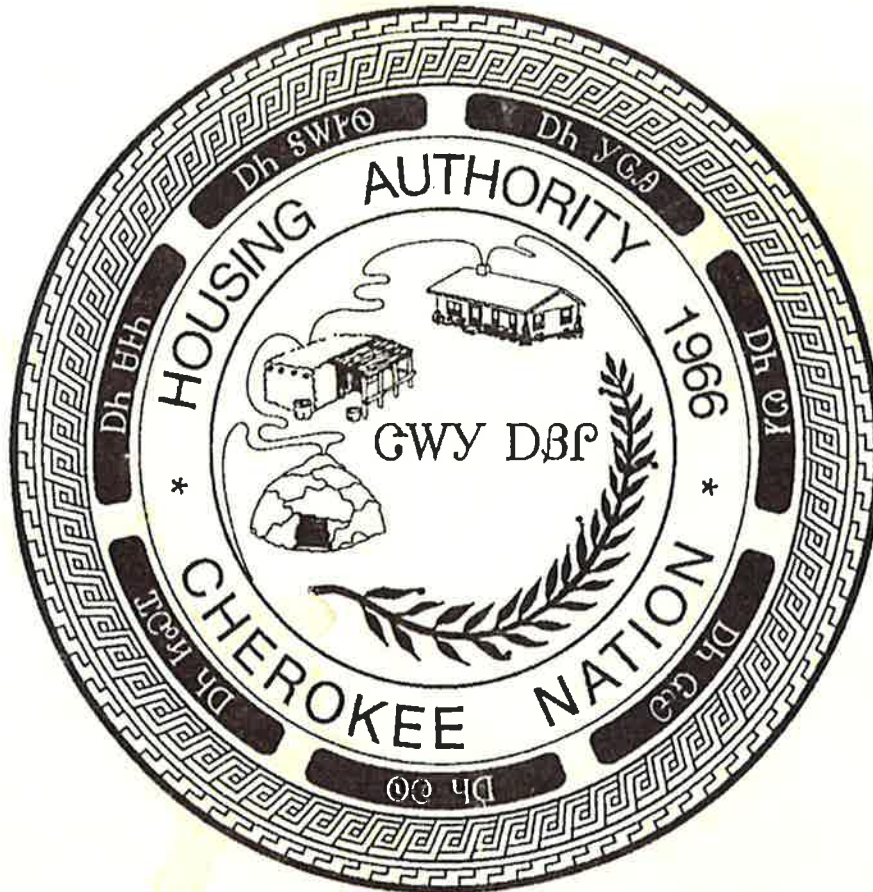


GENERAL SPECIFICATIONS FOR NEW CONSTRUCTION



HOUSING AUTHORITY OF THE CHEROKEE NATION
1500 HENSLEY DRIVE
TAHLEQUAH, OK 74464

REVISED 4/18/02

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DIVISION 1 – GENERAL REQUIREMENTS

Section 1A

GENERAL CONSTRUCTION REQUIREMENTS

PART 1

GENERAL

A-111 SCOPE OF WORK:

- a. Work contemplated includes furnishing of necessary labor, tools, equipment, materials, supplies and miscellaneous items required for construction of Turnkey Housing. All work shall comply with Local Codes & BOCA Codes governing areas where construction is located.
- b. A site shall be provided which includes an arrangement of all site facilities necessary to create a safe, functional, convenient, healthful, durable and attractive living environment for residents.
- c. Before construction of any building site, an inspection shall be made by the Contractor and a representative of the IHA to determine that the site will meet the required standards to avoid or minimize the potential harmful effect of unfavorable features in construction of the house. A soils laboratory shall provide soil boring and analysis.
- d. In the event unusual site conditions not found in the initial soils investigation are encountered, the Contractor shall notify the soils laboratory for additional investigation and recommendations required for preparation of appropriate change orders affecting foundation, paving and compacted fill designs as appropriate.
- e. Three copies of product submittals shall be submitted to the Housing Authority for approval before start of construction. One signed copy to be retained by the Housing Authority, one copy to HUD and one copy returned to the Contractor upon being approved.
- f. Materials installed shall be of such kind and quality to assure that the dwelling will provide (a) adequate structural strength, (b) adequate resistance to weather, moisture, corrosion and fire, (c) acceptable durability and economy of maintenance, and market acceptance.

DIVISION 1 - GENERAL REQUIREMENTS

- g. Materials installed shall be labeled or otherwise identified as conforming to the applicable standards. Mandatory labeling requirements, where applicable, are contained herein for special materials and products.**
- h. Any alternate items that will be acceptable are included in these specifications. In the event any specified item is substituted with an unspecified material, it shall only be done when supported by an appropriate change order in compliance with HUD Handbook 7440.1, paragraph 7-11.**
- i. Where local code, regulation or requirement permits lower standards than required herein, these Minimum Property Standards shall apply. In the event a difference in various codes and requirements exists, the most stringent shall apply.**
- j. These minimum standards shall not be construed as relieving the builder of his responsibility for compliance with local ordinances, codes and regulations including established requirements of a health authority having jurisdiction.**
- k. Existing or partially completed construction which indicates defective construction, poor workmanship, evidence of continuing settlement, excessive dampness, leakage, decay, termites, or other conditions impairing the safety or sanitation of the dwelling shall render the property unacceptable until the defects or conditions have been remedied and the probability of further damage eliminated.**
- l. Before final acceptance, all buildings and on-site improvements including installation of permanent equipment, shall be completed and ready for occupancy and use, except for those items accepted for delayed completion.**
- m. All utility connections shall be made, equipment checked and service available, except for those services customarily provided by utility companies after occupancy. Any additional meter, tap, right-of-way, etc., charges not customarily furnished, the appropriate change order shall be issued to cover the increase of costs involved.**

DIVISION 1 – GENERAL REQUIREMENTS

- n. Construction shall be performed in such a manner that the workmen and public are protected from injury, and adjoining property is protected from damage.
- o. Safety and Health Regulations – Compliance with the provisions of the safety standards of the Occupational Safety and Health Administration, as they apply to residential construction is mandatory. The contractor shall be responsible for compliance with these requirements.
- p. Time allowed for project completion, as noted in the instructions to Bidder and the Bid Proposal will govern for the Project.
- q. Contractor shall pay for all tests of materials as required by Housing Authority and as called for in these specifications, except where the contract documents otherwise provide.

Proctor Density Test

All slab pads will be tested. Slabs shall not be placed on unconsolidated soil fill of any depth unless specified otherwise in soils report. All fills shall be compacted to 95% proctor density according to FHA Data Sheet 79-G.

Streets shall be tested a minimum of every 100'. If street is less than 100' in length, there shall be two tests required. (Refer to Section 2B, paragraph B-233 for compaction requirements and B-221 for street materials.)

These tests listed above are the minimum required. The Housing Authority may call for additional tests if construction circumstances appear to warrant additional testing.

- r. Utility Services and Sanitary Facilities: The Contractor shall provide and pay for all the utilities (electrical, gas and water) to be used in the construction at the job site during the construction period. Contractor shall provide all temporary wiring for lighting or use of power.

DIVISION 1 - GENERAL REQUIREMENTS

- s. Contractor shall provide and maintain temporary toilets for use of workmen during construction, required for all sites containing 2 or more units within the same block. Maintain clean and sanitary condition in compliance with all local and state health requirements. Temporary utilities and facilities shall be removed at completion of construction.
- t. Storage and Materials: All framing materials including trusses shall be properly stored and protected from the weather. All framing materials including trusses shall be stacked on wood blocking and covered with visqueen or other weatherproof material to protect materials from rain, mud, snow and ice.

A-113 PLANS AND SPECIFICATIONS:

- a. The following specifications and attached drawing have been made to form the basis for the installation of this Contractor's work. The plans and specifications shall be considered as mutually explanatory, and any work required by one, but not the other, shall be performed as though required by both. Any errors or ambiguities in the plans and specifications that are discovered by the contractor should be reported to the Housing Authority before bids are received. In case of conflict, the specifications shall govern over the Architectural drawings and the mechanical or electrical drawings, the latter shall govern, unless otherwise clarified by Housing Authority.

A-113 DOMESTIC AND FOREIGN MATERIALS:

- a. Each contract entered into by the Local Indian Housing Authority in connection with the construction of any project shall require that there shall be used, and the Local Indian Housing Authority shall itself use, in the construction of any project only such unmanufactured articles, materials, and supplies as have been manufactured in the United States substantially, all from articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States.
- b. The Government reserves the right, upon request by the Local Indian Housing Authority, to waive the foregoing restrictions if the Government determines that the use of domestic articles, materials or supplies is impractical or that the cost thereof, as determined by the Government, is unreasonable.

DIVISION 1 - GENERAL REQUIREMENTS

A-114 SPECIAL CONDITIONS:

- a. Description: The Construction of this Housing project, which are one (1) story brick veneer wood frame.

Project Number _____

Number of Units _____

A-115 COMMUNICATIONS:

- a. All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.
- b. Any notices or demand upon the Developer-Contractor shall be sufficiently given if delivered at the office of the Developer-Contractor stated on the signature page of the Contract (or at such other office as he may from time to time designate in writing to the Local Authority), or deposited in the United States mail in a sealed, postage-prepaid envelope, or if delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.
- c. All papers required to be delivered to the Local Authority shall, unless otherwise specified in writing to the Developer-Contractor, be delivered to the address listed and any notice to or demand the Local Authority shall be sufficiently given if so delivered, or deposited into the United States Mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission to said Director at such address, or to such other representative of Local Authority or to such other address as the Local Authority may subsequently specify in writing to the Developer-Contractor for such purpose.
- d. Any such notice shall be deemed to have been given as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post, or in the case of telegrams, at the time of actual receipt, as the case may be.

Contract Manager:

DIVISION 1 – GENERAL REQUIREMENTS

A-116 DEFINITIONS:

Whenever used in these specifications, the following reference shall be given to the terms herein defined:

- a. “Local Authority” refers to the Housing Authority of the Cherokee Nation of Oklahoma, Purchaser.
- b. “Inspecting Architect” or “Architect” as used in DIVISIONS 1 through 16 of the specifications refers to the Inspector employed by the Local Authority to inspect the work of the Project. Where inspections are called for in the specifications to be made by the “Architect”, the term “Architect” shall be interpreted to be the “Inspecting Architect”.
- c. “HUD” refers to the Department of Housing and Urban Development, an agency of the United States of America.

A-117 NAME BRANDS:

- a. Where reference is made to “Name Brands” the products named shall be considered primary under this contract. In order for the Developer-Contractor to change products from those named, he must first submit in writing to the local Authority a request for said changes, or request consideration by Amendatory Agreement approved by HUD.

A-118 INSPECTOR:

- a. The Inspector, a representative of the Local Authority, shall have the authority to approve work as required within these specifications.

A-119 PERMITS AND CODES:

- a. The Developer-Contractor and the Contractor’s Subcontractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations.

A-120 INTENT:

- a. The intent of this Contract is that the Developer-Contractor shall base his Contract Sale Price upon the Drawings and the Specifications, but that all

DIVISION 1 – GENERAL REQUIREMENTS

work installed shall comply with all applicable codes and regulations as amended by any waivers.

A-121 AMONG THE ITEMS OF WORK INCLUDED ARE:

- a. Construction of the building.
- b. Construction of outside concrete slabs and sidewalks as called for on the drawings.
- c. Furnishing and connecting of all new utility services and storm sewers called for, and the paying of all fees, permits, and inspections of services in this connection.
- d. Furnishing and installation of any and all special equipment as called for.
- e. Grading as called for.
- f. Removal of debris and turning over to the Local Authority a complete operating facility.
- g. Payment of State and City sales tax and any other State, City, and/or Federal taxes applicable to this work.

Note: The above outline of "work included" shall not in any way limit the responsibility of the Contractor to perform all work and furnish all materials required by the specifications and/or drawings.

- h. Temporary Toilets Facilities: Contractor to provide not less than 1 chemically treated portable toilet for each cluster site, described as being two or more units on the same block. Maintain in a sanitary condition throughout construction period.

DIVISION 1 - GENERAL REQUIREMENTS

A-122 SCAFFOLD, HOISTS AND SAFETY DEVICES:

- a. Provide, erect, and maintain all scaffolding, platform, temporary runways, flooring, guards, railings, etc., required for the protection of workmen and the public.
- b. Provide cranes, hoists or other lifting devices, with qualified operating personnel, necessary for the proper and efficient movement of materials.

A-123 TEMPORARY HEAT:

- a. If temporary heat is required for protection of work before permanent heating apparatus is available for use, Contractor shall provide approved salamanders, stoves with smoke pipes to outside of buildings, or other approved heating apparatus. Install and operate heating apparatuses in adequate and proper manner and maintain fires as required for protecting or drying out work.
- b. If permanent heating apparatus is installed in building prior to time heat is needed for protection of work, Contractor may use permanent heating apparatus but he shall be required to pay all fuel bills until building is accepted by the Local Authority.
- c. Temporary heating apparatus shall be installed and operated in such a manner that finished work will not be damaged thereby.

A-124 ADJACENT AND ADJOINING PROPERTY:

- a. The Contractor and Subcontractors shall not use adjacent property or the public domain for storage of materials or any other purpose whatsoever unless the Contractor has first shown the Owner that he has adequate and proper authority to use the property or properties.
- b. The Contractor shall make good, at his own expense, any and all damage arising from his work operations. When the property or properties are no longer required, the Contractor shall restore same to the original condition and leave same free of all debris, rubbish, etc., caused by his operation.

DIVISION 1 – GENERAL REQUIREMENTS

A-125 SCHEDULES AND REPORTS:

- a. **Lines and Levels:** The Contractor shall be required to furnish engineering and layout services necessary to provide all lines and levels for proper execution of the work under this contract, in accordance with the drawings and specifications.
- b. Throughout these specifications, reference is made to various organizations setting building standards. The following abbreviations are identified for clarification:

ASA	American Standards Association
ACI	American Concrete Institute
ASTM	American Society for Testing and Materials
AISC	American Institute of Steel Construction
AIA	American Institute of Architects

- c. **Required Inspections:**
 - 1. The Inspection Architect and his representatives shall at all times have access to the work wherever it is in preparation or progress. Provide proper and safe facilities for such access and for inspection.
 - 2. The Contractor shall inspect all materials upon their arrival at the project site to determine conformity to the requirements of these specifications.
 - 3. Unsatisfactory materials shall be promptly removed from the premises.

A-126 AS-BUILT DRAWINGS AND SPECIFICATIONS:

- a. One set of the drawings and specifications labeled "RECORD SET" will be issued to the General Contractor. This set will be put in file in the Contractor's field office. The General Contractor shall record all changes in work as built or installed in this set. All notes and changes shall be made in ink. If necessary, additional sketches shall be made on separate sheets of paper. Attach sketches to record set. All changes in work requiring drawings shall be fully dimensioned. All re-routing of piping, conduit and wiring shall be shown. At completion of the project, this record set, supplemented by any detailed sketches, shall be indicated by

DIVISION 1 – GENERAL REQUIREMENTS

“AS BUILT”. Return record set to the Local Authority at completion of project.

- b. Each record made on the record set shall be approved, initialed and dated by the Inspector in charge of the work. Should the Local Authority require a reproducible Record Set, the Developer will furnish the Inspector reproducible sepias for correction and transfer to the Local Authority.

A-127 MEANING AND INTENT OF PLANS AND SPECIFICATIONS:

- a. **Plans and Specifications:**
 - 1. The plans and specifications are to be considered as mutually explanatory, and any work required by one but not the other shall be performed as though required by both. The work shall be accomplished as called for in the specifications and/or as shown on the drawings.
 - 2. These plans and specifications are presumed to be accurate, but extreme accuracy is not guaranteed. Any errors or ambiguities in the plans and specifications that are discovered by the Contractor should be reported to the Architect before work is started. Omission of particular reference to any item necessary for complete installation and proper operation thereof shall not relieve the Contractor of responsibility of furnishing the same at no extra cost. In case of a dispute concerning the true intent and meaning of these plans and specifications, the Architect shall interpret them, and his interpretation shall be accepted by the Contractor as final.

A-128 MEASUREMENTS:

- a. Before ordering any material, item or equipment, and before doing any work, the Contractor shall verify all job measurements and be responsible for same. No extra charge or compensation will be allowed for difference between measurements shown on the drawings and actual job measurements. Any difference found shall be submitted to the Inspector for consideration before proceeding with the work.

DIVISION 1 – GENERAL REQUIREMENTS

A-129 MANUFACTURER'S INSTRUCTIONS:

- a. **Install all equipment or material in strict accordance with the Manufacturer's instructions. Should conflict occur between the drawings and specifications and the Manufacturer's instructions, notify the Inspector for interpretation.**

A-130 BONDS AND GUARANTEES:

- a. **Prior to final acceptance of the building, the General Contractor shall submit to the Inspector the equipment guarantees, and other guarantees on items in the project. The General Contractor shall guarantee all labor, material and equipment furnished under this contract for a period of one (1) year from the date of final acceptance of each phase of the project, by the Local Housing Authority. The General Contractor shall give serial numbers, warranties, and guarantees for each location.**
- b. **When individual pieces of equipment are guaranteed by the manufactures for periods in excess of one year, paragraph (a) above shall in no way affect these warranties.**

DIVISION 1 - GENERAL REQUIREMENTS

A-131 LIST OF SUBMITTALS

1. Caulking
2. Insulation - Blown-in and Batt
3. Insulation Board - Wall and Foundation
4. Roofing
5. Windows and Sliding Glass Doors
6. Screen Doors
7. Metal Exterior Doors
8. Interior Wood Doors
9. Exterior Locksets
10. Interior Locksets
11. Paint - Interior and Exterior
12. Medicine Cabinet
13. Hot Water Tank
14. Bath Tub
15. Stools and Seat
16. Lavatory
17. Kitchen Sink and Strainers
18. Trim for Sinks, Tub, and Shower
19. Exterior Faucets
20. T&P Relief Valve
21. Washer Box
22. Angle Compression Valves and Washer Box Valves
23. Kitchen Vent hood
24. Bathroom Exhaust Vent
25. Furnace and Thermostat
26. Smoke Detector
27. Electric Panel, Breakers, Switches, Receptacles and Boxes
28. Electric Light Fixtures and Ceiling Fans
29. HVAC Equipment

DIVISION 1 – GENERAL REQUIREMENTS

Section 1B

SUPPLEMENTAL GENERAL CONDITIONS

PART 1 GENERAL

B-111 MEANING AND INTENT OF PLANS AND SPECIFICATIONS:

- a. The plans and specifications are to be considered as mutually explanatory, and any work required by one but not the other shall be performed as though required by both. The work shall be accomplished as called for in the specifications and/or shown on the drawings.
- b. These plans and specifications are presumed to be accurate but extreme accuracy is not guaranteed. Any errors or ambiguities in the plans and specifications that are discovered by the Contractor should be reported to the Housing Authority before work is started. Omission of particular reference to any item necessary for complete installation and proper operation thereof shall not relieve the Contractor of responsibility of furnishing the same at no extra cost. In case of a dispute concerning the true intent and meaning of these plans and specifications the Housing Authority shall interpret them, and his interpretation shall be accepted by the Contract as final.

B-112 SHOP DRAWINGS AND SAMPLES:

- a. The Contractor shall submit for the Housing Authority's approval a minimum of three (3) sets of all materials and equipment submittals. The Housing Authority will retain one (1) approved set, returning the remainder to the Contractor. The Housing Authority's approval will not relieve the Contractor from responsibility for deviations from drawings or specifications, unless such deviations have been approved specifically in writing by the Housing Authority, nor shall it relieve him from responsibility for errors of any sort in the shop drawings. No work shall be fabricated until the Housing Authority's approval has been obtained. When the initial shop drawings are noted by the Housing Authority to be corrected, they shall be resubmitted for approval in the above mentioned amount. Any time delay caused by correcting and re-submitting shop drawings will be the responsibility of the Contractor.
- b. Samples and finish of materials as requested shall be furnished with promptness and will be accepted or rejected under same conditions as outlined in paragraph (a).

DIVISION 1 – GENERAL REQUIREMENTS

- c. All shop drawings, schedules, and equipment submittals shall be routed through the Contractor, who shall thoroughly check them regarding quantities, measurements, sizes of members, details, and coordination with adjacent equipment, structural members or Architectural features before submitting same to Housing Authority for approval.

B-113 APPROVAL OF MATERIALS:

- a. All materials hereinafter specified are intended to be the best of the kind described and unless otherwise specified are to be new, unblemished and of the best quality. Where trade names are used in the specifications, they are to indicate the standard of quality required.

B-114 PROGRESS AND COMPLETION:

- a. Time allowed for project completion, as noted in the instructions to Bidder and the Bid Proposal will govern for the Project.

B-116 FINAL ACCEPTANCE:

- a. Before final acceptance, all buildings and on-site improvements, including installation of permanent equipment shall be completed and ready for occupancy and use.

B-117 LANDSCAPING:

- a. Sodding – All sites, Single or Clustered
 - 1. Bermuda/Rye Grass Sodding – Steep areas: Three to one (3/1) or greater slopes, and placed in proper season, as noted below.
- b. All landscaping, seeding, sodding, and tree and shrub planting shall be done in proper season and shall not be undertaken in unfavorable weather conditions.
- c. All areas to receive grass shall be brought to proper grade. Topsoil shall be spread after subsoil fills are properly settled. Topsoil shall be spread to meet approved finish grades and shall be 4" deep. Note: Contractor is to be responsible for grass seeding until grass is up and established.

DIVISION 1 - GENERAL REQUIREMENTS

- d. **Bermuda/Rye Grass Mix seeding shall be done at the rate of (1) pound per 800 square feet of ground to be seeded.**
 - 1. **Areas with a slope of three (3) to one (1) or greater shall be covered with solid sod to alleviate erosion and slope failure.**
 - 2. **Areas that erode after seeding shall be replaced with sod where required.**
- e. **Lawn areas and shrubs shall be fertilized with commercial fertilizer as recommended by the manufacturer for new lawns and trees.**
- f. **Landscaping shall be as specified and shall be planted per AAN Standards (American Association of Nurserymen). Shrubs shall be planted in season as recommended for type by nursery standards for area.**

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 – SITE WORK

Section 2B

EXCAVATION AND SITE WORK

PART 1

GENERAL

B-211

SCOPE:

- a. This section shall include the removal of trees, shrubs, grass and roots within the building area. It shall include cutting and filling, spreading, and tamping of dirt and fine grading as required 15'-0" from building, but shall not exclude positive site drainage.
Note: During the period of construction do such ditching and grading as required to drain water from around building.
- b. Protection of Trees: Take such precautions as necessary to avoid damage to existing trees which are designated to remain, no trees shall remain within 10'-0" of the building.
- c. Removal of Trees: The Housing Authority and/or Owner will mark trees and shrubs to remain. Others, including roots, shall be removed with bulldozer at the start of work. Burning at the premises will not be allowed. Trees, shrubs, and roots shall be hauled away.
- d. Construction of sewer mains and house lines to point of contract limit lines.
- e. Construction of water service lines to point of contract limit lines. All off site water mains and accessory items to be completed in accordance with requirements of the Indian Health Services, the appropriate municipality, and the plan drawings.
- f. Grading, making such cuts and fills as necessary and compacting fills.
- g. Furnishing and connecting of all new services, where called for.
- h. Furnishing of driveways and/or streets serving sites, according to specifications and Housing Authority furnished site information.

DIVISION 2 – SITE WORK

PART II PRODUCTS

B-221 MATERIALS:

- a. **Backfill:** Approved excavated material, free of stones, debris, roots and other organic material.
- b. **Fill Sand:** River sand, free of roots and other organic material.
- c. **Top Soil:** Sand loam, free of clay, coarse sand, stones, plants roots or other organic material.
- d. **Streets (In Easements, serving House Lots, Not Including Concrete Driveways on House Lot):**
 - 1. **Gravel Roads (Minimum street, as required on per site basis):** To be minimum of 4" thick crusher run limestone gravel, not greater than 2" diameter; or, a minimum of 3" of limestone screenings. The gravel surface is to extend across a 20'-0" driving with, plus 4'-0" shoulders either side, for a total of 28'-0", placed in the center of a 60'-0" easement. Soil compaction to be a minimum of 95% Standard Proctor Density, across entire 28'-0" of street width, including shoulders. Depth measurement of gravel is to be met after thorough compaction. Street shall have 3" crown for drainage.
 - 2. **Asphalt Roads (If required by Local Covenants or Housing Authority requirements for a particular site):** A 2" wearing surface of machine applied and compacted hot asphalt mix, for a width of 20'-0", and placed over Gravel Base as described above between shoulders.
 - 3. **Concrete Streets (If required by Local Codes and/or Covenants, for a particular site):** Shall be as required by Local Codes. (Note: Concrete-paving requirements in Division 3 of this specification booklet governs for private, on-site driveways only).
 - 4. **Street Easement:** Minimum 60'-0" wide, (unless otherwise determined by existing conditions), graded and compacted per these specifications.

DIVISION 2 - SITE WORK

5. **Side Bar Ditches:** To be a minimum of 18" deep, below shoulder surface. All culverts and drainage structures and required drainage slopes are to be designed for a minimum 20 year Flood Plain.
6. **Drainage Pipes:** 15" diameter by 20'-0" wide, minimum, CGMP, required at driveways connecting existing and or new streets serving site. Cross drains under streets shall be minimum of 18" diameter and extend past edges of 28' shoulders sufficiently to retain soil and gravel.

PART III EXECUTION

B-231 PREPARATION OF SUB-GRADE FOR FOUNDATIONS:

- a. Topsoil in building area including all grass, trees, roots, etc., shall be removed. Good topsoil shall be stock piled for top dressing.
- b. Old drain lines, piping, and other foreign matter within the building area shall be removed. The sub-grade of all slabs shall be finished to a true and even grade, thoroughly compacted. Sub-grade shall be so arranged as to allow a slab cushion as hereinafter called for.

B-232 EXCAVATION

- a. The contour of footings and slabs is shown on plans. Do all excavation and trenching required for the forming of footings and slabs making proper allowance for slab cushion as hereinafter called for.
- b. Footings must extend 6" minimum into undisturbed soil. Make such provision as necessary for drainage of the excavated area in case of rain. Footings must extend 24" minimum depth below finished grade.
- c. Footing trenches shall be cut to straight and true line.
- d. Fill material shall be considered any material placed above undisturbed soil and shall be compacted to 95% standard proctor density. Fill material shall have a low plasticity index and shall be placed in six (6) inch layers, compacting each layer before the next layer is placed. Each site shall require standard proctor density tests. After subgrade is placed, plumber shall install all underground plumbing and backfill trenches with approved compacted backfill material.

DIVISION 2 – SITE WORK

- e. All plumbing trenches and all required fill exceeding 12" shall be filled with "slab cushion" material and again thoroughly compacted. Before covering with membrane and steel, the "slab cushion" shall be approved by the Housing Authority. All under floor piping and conduit shall be below slab level with a minimum of 4" of cushion material between bottom of slab and piping.
- f. Slab Cushion: Furnish and install a minimum of 4" compacted layer of sand free from lumps of clay and other organic matter. Sand shall have a capillary rise of 2: or less in twenty-four (24) hours in a 4" sample.
- g. The Contractor shall provide proof of compliance from test to the Housing Authority. If the sand does not comply, the Contractor shall use a 4" compacted layer of washed and screened gravel.
- h. Housing Authority shall approve cushion material. Slab cushion shall be finished to a smooth uniform surface for the installation of waterproof membrane as called for under Concrete Work.
- i. Back Fill: Promptly after brickwork is completed, remove all rubbish, install backfill, and do such grading as required to avoid standing water in and around building. Back fill material shall be topsoil.
- j. Grading: Make sure all underground services are in place and the ditches tamped before any attempt is made at finished grading. The grade around building shall be 8" below floor line and sloped uniformly for a minimum distance of 15 feet away from house to achieve a 5% or greater slope. Grading shall then extend away from house pad to drain entire house lot, with no ponding.
- k. All utility ditches shall be tamped and brought to a smooth uniform surface for the installation of waterproof membrane as called for under Concrete Work.

B-233 BACKFILL AND COMPACTION:

- a. Fill, backfill and compact fills as necessary to complete the work with hand and/or suitable power equipment in conformity with the following unless specifically indicated otherwise on the drawings.

DIVISION 2 – SITE WORK

1. Do not start until the fill material, fill areas and equipment to be used in performing the work have been approved by the IHA; all foreign materials have been removed and all new construction over which filling or backfilling is required has been completed and approved, such as footings, drains, utility items and etc.
2. Loosen existing soil for a depth of 2 inches just before filling.
3. Surfaces of new subgrades shall be left clean.
4. Materials used for fill shall be sandy in texture with maximum P.I. of 10 or gravel graded $\frac{3}{4}$ " and downward. Approved on-site materials may be utilized in accordance with Soils Laboratory test report and recommendations for additional fills and backfill. Four (4") inch capillary fill under house slabs shall consist of materials listed above and retained on a #3 sieve up to $\frac{3}{4}$ " in size.
5. Do not place fill in water, or muddy, frozen, or frosty areas; or over debris, wood or foreign material.
6. Place all fills and backfills in layers no over 6 inches thick. Perform this work when soil moisture will permit proper compactions, or when the addition of water by spraying will approach optimum percentage of water. Fill material shall be any material placed above natural grade or rough cut line.
7. Compact fills and backfills to the following minimum densities, expressed as percentages of maximum densities as determined by either ASTM D698 Method D, or AASHO T-99 Method D. Fill and soil compaction control for all backfill areas under slabs, primary lawn areas, and streets or driveways, shall be engineered lifts not greater than 6" for each lift.
 - a. Fill under lawn and planted areas 85 percent.
 - b. Fills under and five feet outside surfaced areas, floors, gutters, curbs, parking areas, walls, terraces, steps, drives and streets, etc., 95 percent Standard Proctor.

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8. Backfill or fill around drain tile and other pipes with hand tools to a point 12 inches above pipe. Compact such fills with small tools, such as power driven tampers and vibrators, to suite fill material.

NOTE: Where sand is used to backfill trenches, the five feet (5') entering or leaving a building shall be clay type soil, which will prohibit the flow of water under the building.

9. Keep the power-driven, rider-operated spreading, compacting, and other heavy equipment away from walls at least a distance equal to the height of fill above footings.
10. Where fill is placed around or on two sides of any structure carry it up evenly and avoid displacement or other damage to structure.
11. All work shall be done in such a manner that damage to existing construction is avoided. Should damage occur, stop work in the area; repair all damage before resuming work in this area.

DIVISION 2 – SITE WORK

Section 2C SITE UTILITIES

PART I GENERAL

C-211 SCOPE:

- a. Site utilities are defined as the distribution systems of water, gas sanitary sewer and electrical power, performed under the contract, within the property lines to a point 5'-0" from each structure.

PART II PRODUCTS

C-221 MATERIALS:

- a. **Sanitary Sewer Lines:** Piping from a point 5'-0" outside building shall be plastic sewer pipe, SDR 35, Type PSM, conforming to ASTM 3034-78 for sewer mains. See Division 15C for service lines to dwelling.

- b. **Water Lines:**

- 1. Underground piping mains, 2" and 6", shall be PVC, SDR 21, PR-200 conforming to ASTM D-2241. Such mains under street paving shall be sleeved with the same material, oversized to accept the dimension of the main encountered.
- 2. Underground house service lines from main to City meter tapping yoke shall be Schedule 40 PVC for sized 1" and smaller conforming to ASTM D-1785, with working pressure as specified at 73.4 F. House service lines under street paving shall be sleeved with steel pipe, oversized as follows:

- 1" Line – 2" Steel Pipe Sleeve
- 2" Line – 3" Steel Pipe Sleeve
- 3" Line – 4" Steel Pipe Sleeve
- 4" Line – 6" Steel Pipe Sleeve
- 6" Line – 8" Steel Pipe Sleeve

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3. Gate Valves:
 - a. 150psi working pressure.
 - b. 2" and larger shall be iron body, bronze mounted, conforming to AWWA C-500.
 - c. Smaller than 2" shall be brass or bronze.
- c. Fire Hydrants: Shall be equal to MUELLER COMPANY NO. A-24015, 3'-6" bury depth. 3-way valve conforming to AWWA C-502. Supply with auxiliary gate valve as required by local authority.
- d. Water Meters: Water service connection to main tap and meter setting shall be per local water utility company requirements.
- e. Gas Pipe and Fittings: All gas piping shall be plastic as NIPAK or standard weight black steel pipe with malleable iron screwed fittings for pipe under 2" in diameter welded for pipe 2" and larger in diameter, equal to B36.10-1959, all pipe and fittings shall receive protective coating equal to TULSA PIPE COATING COMPANY and/or recommendations of local gas company.
- f. Corrosion Protection for Underground Gas Piping: All underground gas lines which are considered as service or buried under ground shall be protected against external corrosion attack as prescribed in the following paragraph. The grade and type of piping and its manner of jointing shall be in conformance with the gas fitting code.
 1. Extruded Plastic: The coating shall be a minimum of 25 mils thick and have a bonding adhesive between the pipe and the plastic as produced by major steel and coating companies.
 2. Epoxy Powder: Epoxy applied as dry resins. The plastic shall be mill-applied to pipe cleaned as in Federal Specifications LC530B. The resin may be applied by electrostat spray to the heated pipe. The pipe shall be heated to 450 degrees F for a continuous, holiday-free, bonded coating having a film thickness of not less than 7 mils as produced by major steel and coating companies.

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- g. The coating system on all straight-run pipe shall be cut back a maximum of 6" from the end. After joining, the fitting surface shall be cleaned free of all grease, pipe, dope, soap, moisture, dust, rust, loose scale or dirt and wrapped with an approved plastic pipeline tape. A minimum of ¼" overlap of the spirally wrapped plastic tape is required. All wrapping shall extend 6" above grade level.
- h. No gas piping shall be installed in or on the ground under any building or structure and all exposed gas piping shall be kept at least six (6) inches above grade or structure.
- i. Cathodic Protection Requirements: maintaining a minimum of negative 0.85 to a copper-copper sulfate reference electrode shall protect all underground gas service and distribution lines.

PART III EXECUTION

C-231 INSTALLATION

- a. Sanitary Sewer:
 - 1. Install sewer lines beginning at low point outlet. Construct sewer line appurtenances as sewer line is constructed.
 - 2. Sewer lines shall not project beyond the inside wall of other sewer lines of sewer appurtenances.
 - 3. Clean inside of pipe before installation, keep pipe clear of dirt, superfluous materials as work progresses. Close dead ends, wyes, tees, other fittings with approved stopper/bulkheads cemented securely in place. Provide tight fitting stoppers or bulkheads in or across the end of sewer lines at end of each day's work.
- b. Water Lines:
 - 1. Install water lines to a minimum depth of 30" of cover below finish grade unless otherwise shown. Provide uniform bearing for pipe full length. Inspect and clean each joint prior to installation. Provide 10' PVC sleeve at sewer crossings.

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2. **Install tees for service lines or laterals free of strain during and after backfill operation. Provide for expansion and contraction movement.**
 3. **Testing shall be provided by raising the water pressure to rated working strength of pipe.**
 4. **Keep clean at all times. Plug, cap tightly closed to prevent contamination. Flush mains prior to chlorination after pressure testing. Apply chlorine at the rate of 50ppm and allow to stand for 24 hours. Chlorine residual shall not be less than 10ppm remaining in the water after 24 hours standing in pipe. Provide chlorination as required by local authority; prevent back flow of lines being treated to lines supply water.**
- c. **Gas Piping: Install pipe and accessories to insure sound undamaged condition. Provide minimum covering 18" below finish grade.**

DIVISION 2 - SITE WORK

Section 2D **TERMITE PROTECTION**

PART I GENERAL

D-211 **SCOPE:**

- a. Provide termite protection for entire ground floor and around entire perimeter of each building.

- b. Treatment must meet State and Local codes and regulations, but not less than herein specified. Treatment must also be guaranteed for a minimum of five (5) years.

PART II PRODUCTS

D-221 **MATERIALS:**

- a. Not less than the designated concentrations of the listed chemicals. Applied only with caution by experienced persons. Oil solutions are prohibited under concrete slabs.

<u>Chemicals</u>	<u>Concentration</u>
Chlorphrifos-Dursban T.C.	1.0% applied in water emulsion
Permethrin-Dragnet	0.5% to 1% applied in water emulsion
Isosenphos-Pryson	.75% applied in water emulsion
Fenvalerate-Tribute	.5% to 1% applied in water emulsion

D-222 **APPLICATION:**

- a. **Foundation:**
 - 1. Apply to critical area, to a depth of one (1) foot, along both sides of all foundation walls, along interior foundation walls, and around plumbing at a rate of four (4) gallons per ten (10) lineal feet. Chemical shall be mixed with the soil as it is being replaced in the trench.

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- b. **Slab-On-Ground Construction:**
 - 1. **Apply an overall treatment under entire surface of floor slab including porch floors and entrance platforms.**
 - 2. **Apply at a minimum rate of one (1) gallon per ten (10) square feet, or as directed by manufacturer to achieve a five-year warranty.**
- c. **General:**
 - 1. **Do not treat when soil or fill is excessively wet or immediately after heavy rains, to avoid surface flow of toxicant from application site. Unless treated areas are to be immediately covered, take precautions to prevent disturbance of treated area by human or animal contact.**

PART III EXECUTION

D-331

OTHER:

- a. **Protect benchmarks, and existing structures, fences, roads, sidewalks, paving and curbs against damage from equipment and vehicular traffic.**
- b. **Protect aerial, surface, or underground utility lines or appurtenances, which are to remain.**
- c. **Place and compact fill materials in continuous layers not exceeding 6 inches loose depth. Use a method so as not to disturb or damage foundation damp proofing.**
- d. **Bring sub-soil to required levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.**
- e. **Slope grade away from building minimum 6 inches in 10 feet, 15 feet around structure.**
- f. **Cultivate, sub-grade to a depth of 3 inches where topsoil is to be places. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.**

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- g. Use topsoil in relatively dry state. Place during dry weather.
- h. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of sub-grade.
- i. Lightly compact placed topsoil.

NOTE: PEST CONTROL MINIMUM STANDARDS

MINIMUM STANDARDS WHICH WERE NOT MET (Explain Why): This is a very crucial part of the contract and one that usually causes the most problems. If you have to deviate from the minimum standards, you **MUST INDICATE WHY** on the contract and have the contract signed by the person who hired you to perform the treatment. We realize there are situations when you will not be able to perform the normal treatment of an area of a house. If you have a legitimate reason for omitting this minimum standard then be sure to note it on the contract and explain why you are omitting it. Pre-treats, as you are probably aware, may require as many as 4 separate trips. If all you complete is the horizontal barrier treatment under the main slab the treatment is considered "partial" and is **UNACCEPTABLE** under the law. If the builder does not call you out to pre-treat the adjacent patios and porches then all you can do is drill and treat the areas that should have been pre-treated. The obligation to ensure that a proper pre-treat is performed is yours. This is also true for the final outside grade. This contract should not be issued until the job is **COMPLETE**. If, for some reason you were unable to perform any specific minimum standard required under the law, and it is not possible to correct this deficiency, (such as failure to pre-treat the footing) then you should note this on the contract and have it signed by the builder. If the porches and patios have not been pre-treated, you should drill and treat them. If the builder will not allow you to drill the porches and patios you should note this fact on the contract and have the builder sign it. If the builder refuses to sign the contract you should say so on the customer signature line. You will continue to issue the "pre-treat certificate" or "soil treatment guarantee" that you have always issued. Be sure to note on these certificates to "see attached contract". By doing this you will protect yourself in the event that the contract becomes separated from the certificate before it finds its way to the final customer.

Remember, the attached contract is just a suggestion. You are free to design your own contract as long as it has the necessary information on it. If you have any questions

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please feel free to contact me (Mike Fuller) or Sandy Wells at 405-521-3864. If we are not in just leave you name and phone number and we will contact you.

PART IV CONCRETE SLABS

D411 Minimum Standard for Termite Work for Pre-construction (pre-treats)

- a. **Pre-treatment of main slab areas (including attached garages) is as follows: (formerly 3-386.B.1.A)**
 1. **Termiticide shall be applied at the rate specified on the label to the complete area to be covered by concrete, and a vertical barrier established immediately inside the stem walls.**
 2. **Treatment should not be made when the soil or fill is excessively wet or when rain is imminent.**
 3. **Precaution should be taken to prevent disturbance of the treated areas by human or animal contact or prolonged exposure to the weather.**
 4. **After completion, each termite pre-treatment shall be stenciled in an area, which will be readily accessible to identify the company.**
- b. **Pre-treatment of adjacent slabs, i.e., porches, patios, entrance pads, walkways, driveways, etc., is as follows: (formerly 3-386.B.1.B)**
 1. **Termiticide shall be applied at the rate specified on the label to those areas of the adjacent slabs, which abut the main structure.**
 2. **Treatment and precautions are same as specified in Section A, Entries 2 and 3.**
- c. **Pre-treatment of outside foundations is as follows: (formerly 3-386.B.1.C)**
 1. **Treatment shall be applied to the soil by trenching or rodding around the entire outside foundation of the structure after the final grade has been established.**

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1. Where trenching is not possible due to rocks, concrete, gutters, etc., the treatment may be accomplished by rodding the chemical at a rate specified on the label.
 2. Where outside foundations (stem walls) have 12" or more of exposed concrete extending above the outside final grade, the outside foundation treatment may be omitted.
- d. Pre-treatment of crawl space construction will be made in the same manner as described in the minimum standards for existing structures (See Part 15 of this Chapter). (Formerly 3-386.B.1.D.)
- e. Any treatment that does not meet all of the minimum standards for pre-treatments under concrete slab or crawl space is considered "Partial Pre-treats" and is not acceptable. However, in the event a portion of a structure is not treated through no fault of the applicator, it will be noted in the pre-treat documentation signed by the contractor (home builder), and include specific reasoning why the area was not treated. (Formerly 3-386.B.1.E.)
1. The diagrams are not drawn to scale.
 2. The shaded areas represent the location of chemicals applied for pre-treatment.

APPENDIX U.
DIAGRAM #1

