BULLETIN NO. DH-2

SPECIFICATIONS

for

TRAILER PROJECTS

and for

TEMPORARY PROJECTS

USING DHT SERIES I STANDARD PLANS

DEFENSE HOUSING BULLETIN

[For Permanent Defense Housing Projects See Guide Specifications, Bulletin LR-13]

PUBLIC HOUSING ADMINISTRATION

HOUSING AND HOME FINANCE AGENCY WASHINGTON 25, D. C.

FEBRUARY 1952

TEMPORARY PROJECTS - TRAILER PROJECTS

F O R E W O R D

These specifications have been prepared for use as a guide in writing specifications for Defense Housing, and is applicable to Trailer Projects or to Temporary Projects using DHT Series 1 Standard Plans. It is not intended for use in connection with Permanent Defense Housing Projects, for which the regular PHA Guide Specifications for Low-Rent Housing are to be used. (See Bulletin No. LR-13.)

These specifications, if properly used, are time-saving and should produce uniform and satisfactory results but, like all such material, must be used with extreme care so as to be adapted to each specific case. Many items will not be pertinent to every project and must, therefore, be deleted; some new items to fit special conditions may be required; and occasionally it will be found that retained items need to be modified, though it is urged that changes be made only under absolute necessity. Specification writers should read carefully the "NOTES TO THE ARCHITECT" preceding each division of the Specification and be governed accordingly. They should also exercise great care to see that the specifications are fully co-ordinated with the drawings.

(Specifications for trailers are not included herein, since all trailers will be purchased under separate contracts.)

CONTENTS

DIVISION DHS 1

CLEARING, EXCAVATING, FILLING AND GRADING

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

SECTION 4. TREES. WHEN THE SITE CONTAINS VALUABLE TREES, THE SPECIFICATION MAY BE WRITTEN TO REQUIRE THE STAKING OF BUILDINGS (OR TRAILERS) IN ADVANCE OF STARTING WORK ON CLEARING. THIS WILL PERMIT A CHECK OF TREE LOCATIONS AND SOME ADJUSTMENT OF BUILDING (OR TRAILER) LOCATIONS TO CONSERVE DESIRABLE TREES.

SECTION 5. DEMOLITION. THIS SECTION, IF INCLUDED, MAY BE DRAWN TO PERMIT CERTAIN BUILDINGS IN GOOD REPAIR TO BE REMOVED AS A WHOLE. INCLUDE A REQUIREMENT FOR RODENT EXTERMINATION IF THE LOCAL HEALTH AUTHORITY SO ADVISES.

SECTION 6. EXCAVATING. IF IT IS KNOWN THAT NO ROCK WILL BE ENCOUNTERED IN EXCAVATIONS, OR IF FOR OTHER REASON NO CLASSIFICATION OF EXCAVATED MATERIALS IS DESIRED, THE FOLLOWING SHOULD BE SUBSTITUTED FOR PARAGRAPH b:

> b. Material to be excavated shall be non-classified and shall include all earth or other materials encountered in excavating and grading operations hereunder. The contract price is understood to cover the removal of all such materials to the depth and extent indicated on the drawings and herein specified.

SECTION 7. GRADING. UNDER PARAGRAPH c, SPECIFY THE METHOD OF COMPACTION TO BE EMPLOYED, ADAPTED TO SOIL CONDITIONS, DEPTH OF FILLS, ETC. FOR TRAILER PROJECTS DELETE ALL INAPPLICABLE REQUIREMENTS IN PARAGRAPHS b AND c, AND CHANGE THE TITLE OF PARAGRAPH d TO "GRADING UNDER TRAILERS."

STRIPPING TOPSOIL. SITE CONDITIONS IN SOME INSTANCES MAY WARRANT STRIPPING AND STORING TOPSOIL FOR RE-USE ON THE SITE. IN SUCH CASE, A PARAGRAPH SHOULD BE ADDED TO THIS DIVISION TO FIT THE SPECIAL CONDITION.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

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DIVISION DHS 1

CLEARING, EXCAVATING, FILLING AND GRADING

1. SCOPE

Include demolition, clearing, excavating, filling and grading required to complete the project, except the work specified in other divisions. See the drawings and General Scope of Work for extent of work.

2. BENCH MARKS AND MONUMENTS

Maintain carefully all bench marks, monuments and other reference points; if disturbed or destroyed, replace as directed.

3. FINISHED GRADES

Finished grades are the required final grade elevations indicated on the drawings. Should finished grades shown by spot elevations conflict with those shown by contours, the spot elevations shall govern. Where not otherwise indicated, areas shall be sloped uniformly between points for which finished grades are shown, or between such points and existing grades which are not to be changed, except that roundings shall be provided at abrupt changes in slope.

4. TREES

a. Protection. Protect trees which are designated to remain by fencing to the limits of branch spread. Do not use areas so fenced for materials storage or other purpose likely to injure tree roots or branches, and perform excavation and grading within such areas only as directed by the Contracting Officer.

b. Removal. Cut down and remove all trees and shrubs within the limits of the construction work under this contract, except as otherwise indicated or directed. Remove all stumps and major roots from areas to be paved or surfaced and from areas on which building foundations and/or slab-on-ground floors are to be constructed; elsewhere, remove completely stumps of 3-inch and smaller trees and cut off stumps of other trees to be removed, at or below existing grade or finished grade (whichever is lower).

5. DEMOLITION

Demolish existing buildings and remove masonry walls, cisterns, abandoned manholes, and other existing structures to levels at least one foot below finished grade. Remove from cellars all partitions, stairways, piping, apparatus and debris. Break up floors of cellars and other underground

structures to permit drainage. Remove curbs, paving, and similar improvements within the site, not shown to be retained in the project. Remove from the project site all materials and debris resulting from the demolition work, except as otherwise provided. Seal sewers leading from buildings, cut off water and gas piping, and disconnect electric and telephone wires, all in accordance with the regulations of the utility concerned. Execute all work so as to avoid hazards to persons or property. Materials resulting from demolition shall be the property of the Contractor.

6. EXCAVATING

a. Dimensions. Excavate to elevations and dimensions indicated, plus ample space for construction operations and inspection of foundation. Excavation for footings may be made to accurate sizes and side forms omitted if concrete is poured without cavings.

b. Rock Excavation. Material to be excavated is assumed to be earth and other materials that can be removed by power shovel. If "rock" is encountered within the limits of excavation, the "Contract Price" will be adjusted. (See GENERAL CONDITIONS.) "Rock" is defined as rock, stone, hard shale, boulders over 1/2 cubic yard in volume, masonry or concrete, that cannot be removed by power shovel without the use of explosives or drills. Excavate rock, if and when encountered, only to the extent directed by the Contracting Officer.

c. Should latent soil or other conditions require changes, the "Contract Price" shall be adjusted. (See GENERAL CONDITIONS.)

d. Shore, sheet and/or brace excavations as required to maintain them secure; remove shoring as the backfilling progresses, but only when banks are safe against caving.

e. Drainage. Keep excavations free from water. Do not discharge water from excavations onto privately owned property.

f. Excess Depth of Excavation. Place footings and foundations upon undisturbed and firm bottoms; fill with concrete any excess cut under footings and foundations. Fill excess cut under slabs with well tamped gravel.

g. Frost Protection. Protect bottoms of excavations from frost.

h. Insanitary conditions encountered shall be corrected or removed entirely.

7. GRADING

a. Grades. Do all cutting, filling, backfilling and grading required to bring the entire project area, outside of buildings, to the following levels:

(1) For surfaced areas, to the underside of the respective surfacing.

(2) For unsurfaced areas, to finished grade, allowing for settlement and the thickness of any ground cover sod to be laid.

On areas where the drawings indicate no general grading is required, provide, spread smoothly, and lightly compact sufficient approved topsoil to fill any depressions in which water could collect. Such topsoil may be taken from site areas on which excavation is required.

b. Deficiency or Excess of Fill Material. Provide suitable earth for requisite additional fill if a sufficient quantity of such material is not available from the required excavation on the site. Remove and dispose of all excess excavated material and material not suitable for fills.

c. Fills. Remove all debris subject to termite attack, rot or corrosion, and all other deleterious materials from areas to be filled or backfilled. Deposit fill and backfill in layers not more than 8 inches thick under surfaced areas or 12 inches under unsurfaced areas; compact each layer thoroughly by approved methods. Rocks, blocks of concrete and masonry materials, but no debris, may be used for fills if well distributed in the earth and provided that such materials shall not be placed in the top 12 inches of fill below finished grade of unsurfaced areas. Fill to grade any areas where settlement occurs.

d. Crawl Space Grading. Excavate and/or fill if and as necessary to: (1) provide the required clearance between the floor system and the ground surface, and (2) to provide adequate slope for drainage to the exterior and eliminate depressions in which water could collect.

8. DISPOSITION OF UTILITIES

a. Rules and regulations governing the respective utilities shall be observed in executing all work under this heading.

b. Active utilities shown on the drawings shall be adequately protected from damage and removed or relocated only as indicated or specified.

c. Active utilities not shown on the drawings shall be protected or relocated in accordance with written instructions of the Contracting Officer, and the Contract Price will be adjusted for such additional work. (See GENERAL CONDITIONS.)

d. Inactive and abandoned utilities encountered in excavating and grading operations shall be removed, plugged or capped. In absence of specific requirements, plug or cap such utility lines at least 3 feet outside of new building walls or as required by the local regulations.

9. GENERAL

Complete the grading operations after buildings have been finished, utilities installed, site improvements constructed, and all materials, rubbish and debris removed from the site.

DIVISION DHS 2

CONCRETE AND MASONRY

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE USE OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

ON SANDY OR GRAVELLY SOIL WHERE DRAINAGE IS EXCEPTIONALLY GOOD, CONCRETE FOUNDATION PADS MAY BE SET ON SUITABLY LEVELED AND COMPACTED GROUND.

ON STEEPLY SLOPING SITES, ADD BRACING TO FOUNDATION POSTS OR PIERS AS NECESSARY.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 2

CONCRETE AND MASONRY

1. SCOPE

Include concrete and masonry work required to complete the project. See the drawings and General Scope of Work for extent and location of the work.

a. Piers shown to be concrete or masonry may be wood as specified in the division CARPENTRY when so indicated on the drawings.

2. MATERIALS

Materials shall conform to the following Standard Specifications or requirements noted below:

Portland cement	ASTM C150-49
Aggregate for concrete	ASTM C33-49, 1 inch maximum size
Aggregate for mortar	ASTM C144-44
Masonry cement	ASTM C91-49
Brick clay or shale	ASTM C62-49
Concrete masonry units	ASTM C90 or C145
Water shall be clean	

a. Handle and store materials in a manner to prevent deterioration and mixing with foreign matters.

3. CONCRETE FOUNDATIONS

a. Job mixed concrete shall consist of 1 part cement, 3 parts sand, and 5 parts of coarse aggregate. Mix for a minimum of 1 minute in a mechanical mixer with only water enough to permit satisfactory placing.

b. Ready mixed concrete shall be certified by the mixing plant to be 2000 pound concrete when tested according to ASTM Standard C 39-44.

c. Forms shall conform to shape, lines and dimensions of the drawings. They shall be substantial and tight enough to retain the concrete without displacement and without leakage of mortar. Footing forms may be omitted when soil is stable and excavation is accurate to dimensions.

d. Soil at bottom of footings shall be approved by the Contracting Officer before placing concrete.

e. Remove mud and water from excavations and wet down dry soil before placing concrete.

f. Deposit concrete as close as practicable to its final position before any initial set occurs. Retempering concrete will not be permitted. Avoid unnecessary construction joints.

g. Tamp and spade concrete in place sufficiently to eliminate voids.

4. CONCRETE FLOORS

Concrete floors on ground shall be constructed as follows:

a. Make earth fills in 6 inch layers sprinkled and rolled with a 5-ton or heavier roller making 4 passes over each layer or roll with a loaded dual tired truck to an equivalent amount. Grade surface to subgrade for concrete.

b. Place 1-3-5 or 2000 pound concrete to thickness indicated on the drawings. Screed to grade. Pitch to drains.

c. Finish floor to a hard trowelled surface using a 1 to 2 mix of cement and sand to dry up any moisture. Finish trowelling shall be delayed until concrete is set and surface dry. Surface shall be hard, smooth and true to line within a tolerance of 1/8 inch in 6 feet.

5. CURING

All concrete shall be kept damp for seven days by sprinkling and a cover of paper or burlap or soil. Clean and wash floors at completion.

6. MASONRY PIERS

Foundation piers shall be constructed of brick, 8 inches square; or load bearing concrete masonry units, 8 inches x 12 inches; or concrete, 8 inches diameter or square; unless indicated otherwise on the drawings. The top block of masonry unit piers shall be filled with concrete. Provide anchors for wood beams and panels.

a. Mortar for masonry piers shall be a 1 to 3 mixture of masonry cement and sand.

b. Construct piers plumb and accurately located. Tops of piers shall finish at a level to maintain floor levels as indicated.

c. Coat top of piers with coal tar (not asphalt) plastic cement or hot coal tar roofing pitch or place a sheet of 26 gage galvanized steel overlapping the masonry 2 inches on top of the pier.

7. COLD WEATHER REQUIREMENTS

Do not place any concrete or masonry on frozen ground. Concrete masonry materials shall be adequately heated before placing and shall be maintained at a temperature of not less than 50°F for not less than 72 hours after placing.

DIVISION DHS 3

CARPENTRY AND MILLWORK

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

INDICATE ON THE DRAWING WHERE WOOD FOUNDATION POSTS ARE PERMISSIBLE AND ADD BRACING TO WOOD FOUNDATION POSTS WHERE NECESSARY.

SINCE THESE DEMOUNTABLE BUILDINGS ARE LIABLE TO BE MOVED TO OTHER AREAS WHERE THE CLIMATE MAY BE RIGOROUS IT IS INADVISABLE TO CHANGE THE VENTING REQUIREMENT INDICATED ON THE DRAWINGS AND REQUIRED BY THESE SPECIFICATIONS.

THE GENERAL SCOPE OF WORK SHOULD SHOW REQUIREMENTS FOR STORM WINDOWS AND COMBINATION DOORS AND WEATHERSTRIPS. STORM WINDOWS AND COMBINATION DOORS SHOULD BE INCLUDED FOR DESIGN TEMPERATURES LOWER THAN -10°F. WEATHER-STRIPS SHOULD BE INCLUDED FOR DESIGN TEMPERATURES BETWEEN +10°F. AND -10°F. DO NOT USE WEATHERSTRIPS WITH STORM SASH OR COMBINATION DOORS.

PLANS FOR MANAGEMENT AND MAINTENANCE BUILDINGS ARE DIAGRAMMATIC ONLY. THE ARCHITECT MUST COMPLETE STRUCTURAL PLANS FOR THESE BUILDINGS FOR USE IN BIDDING AND CONSTRUCTION. THE SIZING OF MEMBERS SHOULD BE ECONOMICAL SINCE THESE BUILDINGS ARE TEMPORARY. ROOF CONSTRUCTION OF BUILDINGS A AND B SHOULD BE SIMILAR TO SERIES 1 DWELLINGS. BUILDINGS C, D, E AND F SHOULD HAVE ROOF TRUSSES OF THE PATTERN INDICATED ON THE DRAWINGS WITH CONNECTIONS

LIKE THE CONNECTIONS SHOWN IN BULLETIN LR-5, PART IV AND CHORDS OF 2 X 3 OR 2 X 4, OR THE TRUSS SHOWN IN THE ABOVE MENTIONED BULLETIN MAY BE USED AS SHOWN. WALL CONSTRUCTION OF BUILDINGS A AND B SHOULD BE SIMILAR TO SERIES 1 DWELLINGS USING 2 X 2 STUDS AND CASEMENT WINDOWS. WALL CONSTRUCTION OF LARGER SERVICE BUILDINGS SHOULD BE CONVENTIONAL WITH 2 X 4 STUDS, STANDARD DOOR FRAMES AND DOUBLE HUNG STOCK WINDOWS.

WHEN TENANT ACTIVITIES BUILDINGS ARE INCLUDED IN ANY PROJECT, THE SPECIFICATIONS SHOULD BE MODIFIED AS NECESSARY.

WHEN LAUNDRY BUILDINGS ARE USED WITH TRAILERS, THE PLAN SHOULD FOLLOW THE LAYOUT ON SHEET 9 OF PLANS FOR SERIES 1 BUILDINGS. THE CONTRACTOR SHOULD BE PERMITTED TO CONSTRUCT THE LAUNDRY BUILDINGS IN PANELS AS INDICATED OR OPTIONALLY OF CONVENTIONAL CONSTRUCTION, AND THE SPECIFICATIONS SHOULD BE MODIFIED ACCORDINGLY.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 3

CARPENTRY AND MILLWORK

1. SCOPE

Include in this division carpentry and millwork, flooring, siding, wallboard, rough hardware and all other work and material, except as specified in other divisions of this specification, of every nature required to complete the work under this contract. See the drawing and General Scope of Work for extent and location of work.

a. Storm sash, combination doors and weatherstrips for window sash and for sides and head of exterior doors shall be furnished only when specifically required in the General Scope of Work.

b. Metal thresholds and hook strips shall be provided for all entrance doors except when combination doors are required.

c. Demountability and Salvage. This specification and the drawings contemplate the construction of temporary buildings prefabricated in panels and arranged for a maximum of salvage when demounted and moved.

(1) Sizes of panels are generally indicated for all buildings. The contractor shall establish the size of panels not so indicated and may, at his option, make panels larger than as indicated but only at his own responsibility to furnish and deliver a completed building substantially identical with the building indicated on the drawings. Details of panel connections shall be as shown on the plans. When panels are increased in size anchorage to other parts of the structure equivalent to the anchorage indicated on the plans shall be provided. Shop drawings shall be furnished to the Contracting Officer for approval before commencing fabrication.

(2) Roof trusses shall be assembled as units. Roof sheathing over trusses shall be boards assembled as panels on 1 x 6 cleats approximately 4 feet on center of 1/2 inch plywood panels. Ceilings under trusses shall be panels of 1/2 inch gypsum wallboard, as specified herein, not less than 4 x 8 feet in size.

2. MATERIALS

Except for exterior stair treads and stringers, and interior and exterior flooring, any species of soft wood lumber or hard or soft millwork material substantially equal to the species and grades listed hereafter may be used in lieu of the lumber herein specified. Lumber resawed from larger sizes shall meet grading requirements after resawing. Lumber shall be straight. Warped panels developing shall be replaced at the contractor's expense. Soft wood lumber shall conform to Federal Specification MM-L-751c. Douglas fir plywood shall conform to Commercial Standard CS-45-48. Lumber shall be sized to standard dimensions in conformance with American Lumber Standards Simplified Practice Recommendation R-16-39.

The contractor shall coordinate the width, thickness and details of frames, trim and other items to conform to the material used when a choice of materials is the contractor's option.

Moisture content of structural lumber 2 inches in thickness and under shall not exceed 19%. Millwork and flooring shall be dried to from 8% to 12% moisture content.

a. Structural lumber for framing light roof trusses not over 2 feet on center, joists, rafters, lintels, beams, studs and plates shall be common dimension or better of any of the following:

Fir	Douglas, West Coast 1/ W. C. L. Rules	No.2
Pine	Southern	No.2

b. Roof sheathing for buildings with trusses shall be any of the following:

Fir	Douglas W. C. L. Rules	No.2
Pine	Southern	No.2
Plywood	Douglas fir Interior type	Grade C-D

Sheathing boards shall be 1 x 6 shiplap or center matched in panels nailed to 1 x 6 cleats approximately 4 feet on center with two 6d nails clinched.

(1) Roof sheathing for Series 1 buildings shall be 1-inch thick fiberboard conforming to Federal Specification LLL-F-321B and the following requirement; A 4 x 8 foot sheet applied and nailed to the roof framing as specified hereafter shall not fail under a test load of 300 pounds applied on a block 4 inches square at the center of any joist space.

c. Exterior and interior frames, trim, cabinets and millwork shall be fabricated from any of the following:

Fir	Douglas W. C. L. Rules	D finish
Pine	Ponderosa	D select

d. Doors shall meet requirements of the Commercial Standards and grades listed below:

Exterior doors and Combination doors	CS 120-48 grade No. 1 or CS 91-41
Interior doors	CS 120-48 grade No. 1 or CS 73-48 grade A

Doors shall be any stock pattern except one panel doors and exterior doors shall have at least 3 square feet of glass in the upper part of the door.

Door thickness shall be as follows:

Exterior and interior doors 1-3/8 inches
Combination and screen doors 1-1/8 inches
unless otherwise indicated on the drawings.

1/ West Coast Lumber Association Rules

(1) Doors, screen doors and combination doors shall be fabricated from any of the following:

Fir	Douglas
Pine	Southern longleaf, northern white, Idaho white, sugar or ponderosa
Cypress	Tidewater red
Redwood	

e. Windows. Frames shall be as detailed on the drawings. Frames for double hung windows shall have counter balancing equipment for sash complying with Federal Specification FF-H-111a, Type F 1240 or F 1245. Capacity of counterbalance shall be as required for weight of glazed sash. Hardware for casement sash is specified in the division HARDWARE.

(1) Wood window sash, storm sash and window screens shall conform to Commercial Standard CS 163-49, except as otherwise indicated on the drawings (double hung windows shall be check rail windows) and be fabricated of any of the following:

Fir	Douglas all heart clear V.G.
Pine	Clear of northern white, Idaho white, sugar, ponderosa or southern
Cypress	Tidewater red
Redwood	

(2) Window screens for wood double hung windows shall be not less than 3/4 inches thick and conform to Commercial Standard CS 163-49 for half window screens except that widths and lengths shall be as required. Stiles shall be grooved to slide on wood or corrosion resisting metal guides attached to blind stops. One groove shall be provided with 2 compression springs to hold the screen in place. Half window screens shall be removable by sliding upward off the guides and be replaced by the reverse procedure. At completion remove any paint from screen grooves and edge of guide and apply parafin lubricant to guide and groove. Attach 2 screen lifts Federal Specification FF-H-111a, Type F 1223, to top of bottom rail. Half length wood screens shall be installed and removed from the inside or outside.

(3) Attach hardware and fit screens and storm sash (when storm sash are a part of the contract) for casement windows to template so that screens and storm sash are interchangeable with each other and with any other window of the same nominal dimension.

(4) Prefitted wood double hung window units, consisting of frames, sash, hardware and means of operation, may be furnished subject to the following conditions: both sash must be capable of being easily raised and lowered and maintain their position at any point of travel; adjustable means to control lifting tension and holding friction shall be provided; the

specific unit proposed for use shall have been in use for not less than three years and shall have demonstrated equality with the windows specified and indicated on the drawing to the satisfaction of the contracting officer.

Sash shall be prime coated before glazing (see Specification for painting and glazing).

f. Screen cloth shall be 14 x 18 mesh and conform to Federal Specification I-S-139, or be galvanized wire cloth.

g. Flooring shall be strips not less than 25/32 inch thick and not over 3-1/4 inches wide, side matched, of any of the following:

Oak	No. 2 common
Pecan, maple, birch and beech	Third grade
Douglas fir WPA Rules, and western larch	C select
Douglas fir WCL Rules, and western hemlock	C
Southern pine	B

Only one species shall be used in one building. Hardwood flooring shall be end matched. Filler strips shall be the same species and equal to the flooring. Factory finished flooring meeting requirements specified above may be used. Flooring shall be kiln dried to and maintained at a moisture content of 8 to 12 per cent.

(1) Flooring in bathrooms shall be fir plywood 5/8 inch thick, interior type grade C-D, covered with asphalt tile (see division ASPHALT TILE).

(2) Porch flooring and exterior steps and stringers shall be 100 per cent heart of Douglas fir, western larch, southern pine, cypress, or redwood.

h. Exterior wall covering shall be any of the following:

Fir	Douglas, W.C.L. Rules	C
Pine Southern	Southern	C
Plywood	Douglas fir exterior type	Grade B-C, 3/8" thick
Hard pressed fiberboard	Fed. Spec. LLL-F-311	Grade B, 3/16" thick

Only one kind shall be used on one building. Wood siding shall be 5/8" x 5-7/16" drop siding. Wood drop siding 3/4 inch thick may be used if the contractor furnishes at his own expense, thicker trim and battens, as required to maintain the same relation of members as indicated on the drawings for 5/8 inch siding.

i. Interior Wall Board

(1) Interior board for walls shall be any of the following:

Hard pressed fiberboard	Fed. Spec. LLL-F-311 Class A 1/4 inch thick or Class B 3/16 inch thick
Douglas fir plywood	CS-45-48 interior type Grade B-D 1/4 inch thick

Composition wallboard conforming to Federal Specification UU-W-101a, .340 inch thick, prefinished with an ivory colored synthetic coating at the factory or sized ready for paint, and meeting the following limitations:

Linear expansion crosswise of panel	.1% maximum
Linear expansion lengthwise of panel	.05% maximum
Moisture content	6% to 12%
Water absorption after 24 hours in water	15% maximum

Only one kind shall be used in one building.

(2) Interior board for ceilings shall be gypsum wallboard (3/8 inch thick for 16 inch spacing and 1/2 inch thick for 24 inch spacing of framing members) conforming to Federal Specification SS-W-51a and finished on the exposed surface with a layer of aluminum foil not less than .00035 inches thick, factory applied by the manufacturer of the wallboard.

j. Asphalt building board shall be 1/8 inch thick, composed of 2 or more sheets of paper or felt impregnated with bitumen and filled to the required thickness of bituminous mastic. The board shall not be brittle at -60°F. or bleed at +160°F.

k. Calking compound shall conform to Federal Specification TT-C-598.

l. Medicine cabinets shall be stock type surface mounted or recessed as indicated on the drawings, wood or metal with mirror not less than 12 x 14 inches and 3 round edge glass shelves. Finish shall be oven dried white enamel.

3. WOOD PRESERVATIVE TREATMENT

Door frames and doors in exterior walls, wood porch posts, window frames and sash shall be preservative treated and bear the Seal of Approval of the National Woodwork Association or be accompanied by an affidavit from the manufacturer certifying that they have been fabricated from all heart lumber or have been treated in accordance with the Minimum Standards established by the National Woodwork Association. Brush coat cut surfaces with a 5 per cent solution of the same preservative.

4. STORAGE AND PROTECTION

a. Pile lumber clear of ground to insure proper ventilation and drainage.

b. Protect millwork and flooring against dampness during and after delivery. Store in well ventilated buildings and where not exposed to extreme changes of temperature and humidity.

5. WOOD FOUNDATIONS

When so indicated on the drawings wood posts may be used in lieu of masonry piers. Rough sawed lumber may be used for foundation girders and posts.

a. Wood posts shall be 75% heart of oak, cedar, chestnut, locust, redwood, fir, black walnut or black cherry, untreated, or any other wood which has been air dried to 19% moisture content and dipped in a 5% solution of pentachlorophenol or equivalent for 5 minutes. They shall be round or square, free of bark, not less than 6 inches diameter or 5 inches square.

b. Erect wood posts plumb and true to line with ends square and solidly bedded on footing pads. Anchor posts to beams as shown and to footing pads with equivalent anchors. Pack earth tightly around posts. Cover tops of posts with coal tar or sheet metal as specified for masonry piers.

c. Wood girders shall be set accurately to line and level on foundations. Rough lumber shall be sized at ends to provide a straight level top surface. Securely nail anchors to girders.

6. FABRICATION

a. Shop and Erection Drawings. No drawings other than as enumerated in the Schedule of Drawings forming a part of this contract will be furnished by the Government. Any shop drawings needed shall be furnished by the contractor and submitted to the Contracting Officer for approval.

(1) Mark panels and other parts, including equipment and loose items such as battens and trim with waterproof ink or paint on edges with indentification as indicated on the drawings. Mark locations of reinforcement added for support of plumbing on bottom and sides of panels.

b. Milling and Cutting. Lumber, wallboard and millwork shall be accurately cut and milled to required dimensions by mechanical wood working equipment. Surfaces of lumber exposed in ceilings shall be sanded clean and smooth for paint. Surfaces of millwork shall be machine sanded.

c. Assembly. Materials for panels and trusses shall be assembled in jigs consisting of metal angles bolted to tables covered with steel plate not less than 1/8 inch thick or plywood not less than 3/4 inch thick in the largest practicable size. Panels shall be interchangeable with other panels of the same

indicated dimensions. Fasten members together as indicated or as specified. Use common wire nails for connections of framing and finish nails for millwork items.

(1) Finished panels shall measure 1/16 inch over all scant of indicated dimensions except thickness.

(2) Check jigs periodically as necessary to maintain accurate dimensions.

d. Door and window frames shall be dadoed and securely nailed together with 8d coated nails. Set frames in panels parallel and square with panel sides. Panels containing doors shall have temporary struts across bottom of panels.

e. Cut siding material accurately to dimensions with edges and ends square. Remove burrs with sand paper. Hard pressed fiber board siding shall be sprinkled on the rear face and stacked back to back overnight to expand. Plywood and hard pressed fiberboard shall be full size of panel without joints.

(1) Line ends of siding board perfectly true accurately in position and nail boards to each stud with two 8d siding nails driven flush with surface.

(2) Plywood and hard pressed fiberboard siding shall be accurately set in place and nailed with 4d casing nails, 6 inches on center on intermediate studs and 4 inches on center at edges. Begin nailing at center and finish at edges. Drive nails flush with surface.

f. Ventilation of wall panels. When wood drop siding is used for exterior wall covering no ventilation of wall panels is required. When plywood or hard pressed fiberboard is used for siding each stud space in exterior wall panels shall be vented top and bottom as indicated on the drawings, or a 1 inch diameter midget louver as made by the Midget Louver Company, Norwalk, Conn., or an approved equal, placed in the exterior shell near the top and bottom of each stud space shall be used in lieu of the venting indicated on the drawings. Barrels of louvers shall not penetrate inward past the siding more than 1/4 inch.

(1) Ventilating slots shall be screened with plastic screening or galvanized wire cloth 14 x 18 mesh as indicated on the drawings.

(2) Ventilating slots at bottoms of panels shall be protected from rain with sheet metal strips of 28 gage galvanized steel, tin, or terne plate painted with red lead paint.

g. Interior wall board shall be accurately cut to size. Panels 4 feet wide or less shall be without joints. Hard pressed fiberboard shall be sprinkled on the rear face and stacked back to back overnight to expand. Corners shall be sanded. Nail panels to intermediate supports 6 inches on center and at edges 4 inches on center with 4d casing nails for unfinished boards and with 3d or 4d

flat head colored nails furnished by the manufacturer for prefinished boards. Begin nailing at center and finish at edges. Drive nails flush. Plywood shall be sanded smooth before painting.

h. Ceiling board in Series 1 buildings shall be applied with aluminum face exposed without exposed joints and nailed only enough to maintain its positions while the roof deck is applied.

i. Apply fiberboard roof sheathing in the largest practicable size over the ceiling board. Make joints only over solid backing. Nail with 10d nails 6 inches on center on intermediate framing and 4 inches on center at edges. Nail center first and edges last. Locate nails accurately by means of a line or straight edge. Drive nails flush.

j. Flooring shall be sorted or cut before laying to exclude any of the following defects: voids on finished edges, rot, knotholes over 3/8 inch in diameter, unsound knots, shakes, heart checks, split ends that cannot be drawn tight, torn grain and defects which will not sand smooth. After application of floor insulation, lay flooring perpendicular to joists with joints close. Provide for expansion by inserting 18 gage metal strip in every 3d joint. Stagger ends. Strips of flooring shall bear on at least 1 joist. Blind nail with 8d flooring nails to each joist. Joints in flooring with plain ends shall occur over joists only.

(1) Sand floors parallel to grain until smooth, finishing with fine paper.

(2) Provide oak thresholds where shown.

k. Apply asphalt building board to under side of floor panels in the largest practicable size of sheets. Make joints only over solid blocking. Nail to floor joists with 1 inch galvanized roofing nails 6 inches on center on intermediate joists and 4 inches on center at edges. Nail from the center out toward the edge.

l. Doors, sash, screens and storm sash shall be fitted and applied to frames complete with hardware attached. Clearances at top and sides of doors shall be 1/8 inch and 3/16 inch at bottoms. Clearances of swing screens, storm sash and casement sash shall be 1/8 inch all around. Apply 2 dunnage strips 1-1/4 inches high full length of panel to panels containing doors and windows. Remove door knobs and any other hardware projecting more than 1 inch from the surface, tag for identification and ship boxed with similar items separately from panels.

Movable items shall operate without binding, shall close evenly against stops and double hung windows shall balance. Hardware shall be so applied as to perform its intended functions perfectly.

m. Cabinets, closets, shelving, ironing boards, counters and miscellaneous millwork items shall be fabricated from sound kiln dried lumber with members not less than 3/4 inch thick and wide enough to insure sturdy rigid construction.

(1) Work tops of kitchen work tables and sink cabinets shall be 3/4 inch thick maple, ash or birch, tongued and grooved strips not over 3-1/4 inches wide glued together. Bread boards shall be 3/4 inch thick of similar material.

(2) Shelves shall be 5 ply plywood or solid stock not less than 3/4 inch thick. Support shelves on cleats securely fastened to adjacent construction.

(3) Doors shall be 5 ply plywood or hard pressed fiberboard not less than 1/2 inch thick, edges lap type, or paneled with solid stiles and rails with plywood panels.

(4) Drawer fronts shall be straight grained stock 3/4 inch thick. Partition 1 drawer for table silver.

(5) Laundry work table tops shall be sheathing boards covered with 3/16 inch hard pressed fiberboard Class B or 1/4 plywood interior type grade B-D.

n. Loose strips, trim and miscellaneous items required for completion shall be milled to required dimensions and supplied ready for installation. All door and window trim and all standing trim shall be in 1 length. Running trim shall be in long lengths. Pack and wrap strips and trim in suitable coverings to prevent damage and loss.

o. Include metal flashing at heads and sills of windows when indicated on the drawings of 26 gage galvanized steel painted both sides with red lead paint.

7. SHIPMENT

Shipment from factory to site shall be made by truck with dunnage, wrapping and precautions required to provide delivery in perfect condition or a new item provided.

8. ERECTION

Erect the structures in accordance with the drawings placing all parts in true straight even planes with floors level. Adjust parts to correct any deficiencies in panel dimensions whether due to errors or shrinkage or swelling due to change in moisture content. Provide temporary bracing as required.

a. Adjust sheet metal protection of ventilating slot at bottom of panels to positions indicated on drawings and clean ventilating slot of any excess insulation.

b. Apply battens, filler strips and aligner strips required and as indicated on the drawings. Nails which will be withdrawn during future demounting shall be casing nails. Provide all nails, screws and rough hardware of every sort required for the buildings.

c. Calk joints indicated on the drawings to be calked filling joints completely and clean adjacent surfaces of excess compound.

d. Set trusses on with centers as indicated and square with the walls.

e. Erect roof panels over trusses with edges in close contact and end joints over trusses. Nail to roof trusses approximately 6 inches on center with nails penetrating the trusses not less than 1-1/8 inches.

f. Erect ceiling panels of gypsum wall board in buildings with roof trusses with aluminum face exposed and edges in close contact with long dimension perpendicular to roof trusses. Make end joints on trusses. Nail to intermediate supports 8 inches on center and 6 inches on center at edges with 4d galvanized or cadmium coated shingle nails or aluminum nails of equivalent size. Drive nails flush.

g. Install a medicine cabinet in the bathroom centered 5'0" above floor level.

h. Bathroom accessories consisting of 1 paper holder with roller bar and wire supports, two 24 inch towel bars of enamel finished hardwood, 1 tooth-brush holder and 2 soap dishes of porcelain or plastic or chrome plated brass shall be furnished and set on wood rail in bathroom with soap dish in the shower where directed.

i. Install equipment such as cabinets, tables, ironing boards, curtain rods, shelving and miscellaneous items in place as indicated on the drawings. Fasten with screws to facilitate demounting.

j. Loose finish hardware not attached in the shop shall be applied, but after completion of painting when practicable.

k. Any doors, sash or screens which have been shipped separately shall be attached and hardware adjusted.

l. Exterior items such as steps and platforms shall be provided as indicated on the drawings.

m. Remove rubbish, leave building broom clean and doors, windows and equipment in perfect working order.

n. Office counters shall be constructed in accordance with the specifications for cabinets and as follows:

(1) Counter tops shall be 5/8 inch plywood covered with 1/8" thick hard pressed fiberboard Class B.

(2) Gates shall be 1/2" plywood or 3/4" paneled doors.

(3) A drawer with 5 change pockets and 5 compartments for paper money shall be included.

(4) Guard screens of 1/4" plywood set in wood frames not less than 20 inches high, unless otherwise shown, shall be provided for top of counters. Provide 2 panels 16 inches wide of plate glass with a 2 inch space at bottoms and a 3 inch circular opening 4-6" from the floor. Provide 1 hinged wicket for packages and cabinet doors and drawers as indicated.

o. Work bench shall have 2 x 4 frames 4 feet on center x braced with 1 x 4 boards. Top of work bench shall be 2 inch oak or maple planks. Provide a skirt board 12 inches deep on front of bench and longitudinal x bracing in 1 panel.

p. Three galvanized or cast iron clothes line hooks 3/8 inch in diameter shall be provided on building studs approximately opposite clothes poles and 6'6" above grade.

q. Fire protection guards between heaters, and stoves and building walls shall be 26 gage galvanized steel supported 1 inch from walls by galvanized 26 gage sheet metal Z bars not over 18 inches apart. Z bars shall be secured to walls by 5/16 inch stove bolts 12 inches apart.

r. Metal threshold for entrance doors shall be brass, aluminum or cast iron not less than .1 inch thick of pattern similar to indication on the drawings. The hook strip shall be spring bronze or stainless steel not less than .02 inches thick and engage the metal threshold closely when doors are closed.

s. Weatherstrips for casement and double hung windows and for entrance doors shall be brass, bronze, zinc or stainless steel strips not less than .017 inches thick, one or two member, manufacturer's standard type, providing a weather tight seal on all 4 edges of doors and casement and double hung sash. They shall adjust themselves to the swelling and shrinking of the sash and frames without impairing their efficiency or the easy operation of the sash and doors. For attaching zinc or stainless steel strips use cadmium or zinc coated nails or screws and copper nails or brass screws for brass or bronze strips.

DIVISION DHS 4

THERMAL INSULATION

NOTES TO THE ARCHITECT:

SINCE THESE DEMOUNTABLE BUILDINGS ARE APT TO BE MOVED TO OTHER AREAS WHERE THE CLIMATE MAY BE RIGOROUS IT IS INADVISABLE TO CHANGE THE INSULATION REQUIREMENTS REQUIRED BY THESE SPECIFICATIONS.

VAPOR RESISTANCE IN CEILINGS IS PROVIDED FOR BY THE USE OF ALUMINUM FOIL ON GYPSUM WALL BOARD.

THE USE OF REFLECTIVE INSULATION AND ASPHALT BACKER BOARD IN FLOOR PANELS MAKES THE USE OF SKIRTING UNNECESSARY EVEN IN COLD CLIMATES.

THE THICKNESS OF FIBER BOARD ROOF SHEATHING MAY BE INCREASED WHEN CLIMATE IS COLDER THAN -10°F. DESIGN TEMPERATURE. (SEE DIVISION DHS 3.)

CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 4

THERMAL INSULATION

1. SCOPE

Provide reflective insulation in paneled wood floors of Series 1 buildings and blanket insulation in walls of Series 1 buildings and walls and ceilings of buildings with pitched roofs. Insulation of ceilings of Series 1 buildings is provided by the fiberboard roof deck.

2. MATERIALS

a. Reflective insulation shall be sheets of aluminum foil mounted on both sides of an 80 pound Kraft paper. Reflective insulation shall be 25 inches wide for 24 inch joist spacing and 36 inches for 16 inch or less spacing.

b. Blanket insulation shall be 1 inch thick in walls and 2 inches thick in ceilings of the following types and conform to the Federal Specifications listed therewith as follows:

Mineral Wool	HH-I-521c
Cotton	HH-I-528
Vegetable or wood fiber	HH-I-571a

(1) Blanket insulation in ceilings shall be enclosed on both sides in a paper envelope or be a type not needing a cover, permitting the insulation to be salvaged and rolled up for transportation when the house is demounted. Blanket insulation in walls shall be enclosed on both sides in a paper envelope or be a type not needing a cover. A vapor barrier consisting of an asphalt coated tough strong paper conforming to Federal Specification UU-P-147, Class B (this equals a vapor permeability of .86 grains of water vapor per square foot per hour per inch of mercury) shall be included on the warm face of the insulation as a part of the insulation or as a separate vapor barrier. The vapor barrier shall be wide enough to lap 1/2 inch on the framing with flanges of the same material as the barrier. (Untreated or parafin treated edges are not permitted.)

3. INSTALLATION

a. Apply reflective insulation to the top of floor joists before laying flooring. Staple the foil covered paper to the floor framing approximately 12 inches on centers and with sufficient slack so that the insulation will sag below the flooring providing an air space of 3/4 inch or more. Perforate low points of the foil with 8d nail holes 24 inches on center for drainage.

b. Apply blanket insulation to wall panels as follows: Cut blankets into lengths 1 inch longer than the space to be filled and trim the insulation 1/2 inch back from end of vapor barrier. Staple front and rear envelopes together through the insulation at ends with clinch type stapler to prevent interference with ventilation in ventilated panels. Apply the blanket to the wall panels with the vapor barrier lapped 1/2 inch or more on the arm face of the framing and the insulation in the interior of the panel. Staple edges 12 inches on center.

c. Apply insulation without integral vapor barrier as follows: Cut blanket 2 inches longer than the space between framing to allow for stapling. Staple blanket between framing on sides, top and bottom. Apply vapor barrier over blanket to inside face of framing and staple to framing 12 inches on center.

d. Apply insulation in ceilings by laying in place between the trusses after ceiling board is in place. Avoid interference with ceiling ventilation and avoid any omissions or uninsulated areas.

DIVISION DHS 5

ROOFING; COMPOSITION

1. SCOPE

Include composition roofing on Series 1 buildings required to complete the project as indicated on the drawings or specified. See the drawings and General Scope of Work for location and extent of work.

a. Composition roofing shall be 3 ply asphalt or coal tar pitch roofing, both with gravel surfacing.

2. MATERIALS

Materials shall conform to the standard specifications or special requirements listed therewith as follows:

a.	Asphalt roofing felt	HH-F-191a, 36 inches wide
b.	Coal tar pitch roofing felt	HH-F-201, 36 inches wide
c.	Asphalt	SS-A-666 Type 1
d.	Coal tar pitch	R-P-381 Type 1

e. Asphalt primer shall be an asphalt base thinned with a volatile solvent.

f. Bituminous plastic cement shall be an asbestos fibrated asphalt cement mixed to proper consistency at the factory and delivered in sealed containers.

g. Slag or gravel surfacing material shall be hard durable clean particles evenly graded in size from 1/4 inch to 5/8 inch and be dry when applied.

h. Sheathing paper shall be an unsaturated paper weighing not less than 5 pounds per 100 sq. ft.

3. GENERAL REQUIREMENTS

Roof surfaces shall be smooth, even, firm, sound, dry, free from high spots and depressions and broom clean before any roofing is applied. Application of the roofing will be considered as evidence of acceptance of the roof deck and approval by the roofing contractor as an acceptable base for roofing. Use coal tar pitch with coal tar pitch saturated felts and asphalt with asphalt saturated felts.

a. Heat bitumen to not more than 400°F. Use heating apparatus which is capable of providing controlled temperatures. Apply hot bitumen at temperatures from 350°F. to 375°F. Bitumen which has been burned shall be discarded.

b. Roll or broom asphalt saturated felts firmly in place without wrinkles or blisters.

c. Lower 2 plies of coal-tar-pitch roofing felts shall extend 6 inches beyond the open edges of roofs, be turned back over the top of upper felt, and be cemented down with hot coal-tar-pitch.

d. Provide strips of felt in place with cement between plies at starting edges of all courses of felt so that the total number of felts at starting edges and all points shall be equal to the number of plies specified for the roof.

e. Flashings and all other connections of roofing with other work shall be completed before application of final coating of bitumen.

f. Coordinate work with sheet metal work. Apply final coat of bitumen on any area as rapidly as practicable after completion of sheet metal work. Incomplete roofing shall be protected from dampness by a light coat of bitumen when final coating is delayed.

g. Bed metal base flashings, gravel stops, and similar items in bitumen after all roofing felts are laid and strip such items with not less than two strips of felt 10 and 12 inches wide over the metal and embedded in bitumen.

h. Weathertightness. Composition roofing shall be weathertight and watertight.

i. Avoid defacement of any other work and material.

j. Protect fiberboard roof deck with boards against damage from foot and other traffic as necessary.

4. APPLICATION OF COMPOSITION ROOFING

a. Coal tar pitch or asphalt composition roofing shall be 3 ply applied as follows: (See GENERAL REQUIREMENTS in this division.)

b. Lay strips of sheathing paper 12 inches wide over panel joints in fiberboard roof sheathing and nail in place with roofing nails through metal or fiber discs 12 inches on center and staggered.

c. Coat the fiberboard roof deck with a mop coat of hot bitumen using 25 pounds per square.

d. Lay 3 plies of 15 pound saturated roofing felts lapping each felt 25 inches over the preceding felt, mopping the full 25 inch lap with hot bitumen so that in no place shall felt touch felt.

e. Coat the surface with a uniform poured coat of 75 pounds per square of bitumen into which while hot embed 300 pounds of slag or 400 pounds of gravel per square.

DIVISION DHS 5a

ROOFING; SHINGLES

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE USE OF THE ATCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

USE SELF SPACING INTERLOCKING SHINGLES FOR AREAS WHERE WIND RESISTANCE IS OF PRIME IMPORTANCE.

USE 210 LB. STRIP SHINGLES FOR AREAS WHERE WIND IS NOT TOO SEVERE AND THE APPEARANCE OF STRIP SHINGLES IS PREFERRED.

CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

PARAGRAPHS MARKED ( ) COVER VARYING TYPES OF CONSTRUCTIONS AND MAY NOT BE REQUIRED IN THE PROJECT. SELECT THE TYPE OR TYPES SUITABLE FOR THE PROJECT AND OMIT THOSE NOT SUITABLE.

DIVISION DHS 5a

ROOFING; SHINGLES

1. SCOPE

Include asphalt shingle roofing on buildings with pitched roofs required to complete the project as indicated on the drawings or specified.

2. MATERIALS

Materials shall conform to the standard specification or special requirements listed therewith as follows:

a. Asphalt roofing felt HH-F-191a

b. Asphalt shingles shall conform to type and weight in place as specified herein. Colors shall be manufacturers' standard as selected by the Contracting Officer but not more than 4 colors will be selected and only 1 color used on one building. Asphalt shingles shall bear Underwriter's Laboratories Class C label.

( ) Asphalt shingles shall be rectangular strips, 3 tab 12 x 36 inch, thick butt, or 4 tab 10 x 36 inch standard type, weighing not less than 210 pounds per square.

( ) Asphalt shingles shall be self spacing individual interlocking shingles of from 18 to 24 inches width and length, having locking tabs or projections, providing complete double coverage and weighing not less than 220 pounds per square.

c. Bituminous plastic cement shall be an asbestos fibrated asphalt cement, mixed to proper consistency at the factory and delivered in sealed containers.

d. Roll roofing shall be a slate surfaced ready roofing weighing not less than 80 pounds per square.

e. Nails for fastening felt and asphalt shingles shall be large head roofers zinc coated nails long enough to penetrate roof deck 1 inch.

3. GENERAL REQUIREMENTS

a. Roofing shall not be laid until all sheet metal, crickets or work which extends under roofing material have been satisfactorily installed.

b. Flashing. Coordinate roofing work with flashing of openings in roof surfaces and other sheet metal work.

c. Roof shall be weathertight, free from leaks and other defects.

4. APPLICATION

a. General. Cover roof surfaces with 15 pound bituminous saturated roofing felt before laying asphalt shingles. Double felt not less than 18 inches wide at ridges. Lap horizontal joints 3 inches, vertical joints 6 inches. Nail to sheathing 12 inches on center in both directions through metal or fiber discs.

b. Asphalt shingles shall be applied as follows:

(1) After application of sheetmetal edge strips as specified in the division SHEETMETAL apply starting courses and field courses in true horizontal and vertical lines in exact accordance with the instructions of the manufacturer except as otherwise specified. Strip shingles shall have a 5 inch exposure.

(2) Nail shingles using 6 nails for 3 tab strip shingles, 8 nails for 4 tab shingles and not less than 4 nails for interlocking shingles.

(3) Hips and ridges shall be applied by bending individual rectangular shingles so as to have equal exposures, not less than 5 inches on each side. Lay with not over 5 inch exposure or less than 2 inch headlap, nailing 5-1/2 inches from exposed end and 1 inch from each edge. Cover nails in last shingle with plastic cement. Warm shingles in cold weather before bending.

(4) Bed shingles laid over metal flashing of pipes and chimneys in bituminous plastic cement.

DIVISION DHS 5b

SHEET METAL WORK

1. SCOPE

Include sheet metal work required to complete the project as indicated on the drawings or specified. See the drawings and General Scope of Work for extent of work.

2. MATERIAL

a. Sheet metal shall be 28 gage, best commercial quality galvanized copper bearing steel, primes only, unless otherwise indicated on the drawings or specified herein.

b. Plastic cement shall be asbestos-fibrated asphalt cement mixed to proper consistency at the factory and delivered in sealed containers.

c. Asphalt coating for paint shall be asphalt dissolved in a volatile solvent.

d. Sheathing paper shall be an unsaturated felt weighing not less than 5 pounds per 100 square feet.

e. Nails, screws and bolts for fastening galvanized steel shall be ferrous metal galvanized or cadmium coated. Nails shall be long enough to penetrate wood 1 inch.

3. GENERAL REQUIREMENTS

a. Surfaces to be covered with sheet metal shall be smooth and free from holes and shall be cleaned of dirt, rubbish and other foreign materials before sheet metal work is started. Projecting nails shall be driven flush with the roof boarding.

b. Joints and seams shall be avoided as much as possible. Overlap seams in direction of flow of water. Make ample provision for expansion.

c. Flanges (not exposed to weather) of gravel stops, edging strips, vents and flashings or other work used in conjunction with composition roofing shall be painted with asphalt coating, embedded in hot bitumen, set on top of all felts and nailed 3 inches on centers.

d. Clean sheet metal as each section is completed. Neutralize excess flux by washing metal with a solution of washing soda. After cleaning, wash with clear water. Avoid staining or discoloring adjacent work.

e. Sheet metal work shall be water and weathertight with lines, arrises and angles sharp and true and plain surfaces free from waves and buckles.

f. Coordinate work with roofing. Apply sheet metal work so as not to delay completion of roofing.

4. INSTALLATION

a. Gravel stop shall be formed in lengths of not to exceed 10 feet with flanges extending 4 inches on the roof and nailed 3 inches on center. Stop shall be 3/4 inch high with profile as indicated on the drawings. Lap ends of sections 6 inches and bed in plastic cement.

b. Chimney flashing shall consist of base and counter flashing extending 4 inches on the roof over composition roofing. Lap and solder corners and extend flashing over the top of the wood curbs surrounding the chimney. Solder seams while in a flat position. Nail edges 3 inches on center over composition roofing. Nail top to wooden curb under chimney flanges.

c. Cricket flashing when shown, shall extend under shingles 8 inches. Joints shall be lapped or locked and soldered. Nail in place under shingles and cover nails with plastic cement.

d. Metal edging not less than 5 inches wide shall be applied to eaves and rakes of pitched roof buildings as indicated on the drawings. Lap sections 2 inches at eaves and 1 inch at rakes. Nail 8 inches on center.

DIVISION DHS 6

BUILDERS HARDWARE

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE USE OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

ADD SPECIFICATIONS FOR KEY CONTROL FROM THE GUIDE SPECIFICATIONS WHEN PROJECT IS LARGER THAN 25 DWELLINGS.

CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 6

BUILDERS HARDWARE

1. SCOPE

Include builders finish hardware and items specified in this division and accessories required to complete the project. See the drawings and General Scope of Work for location and extent of work.

a. Balances for double hung windows are specified in the division CARPENTRY AND MILLWORK.

b. Items of hardware not definitely specified herein and necessary for completion of the work shall be provided of suitable types having as nearly as practicable the same operation and quality as the types specified. Sizes shall be adequate for the service required.

2. MATERIALS

a. Hardware shall conform to the following Federal Specifications and the type numbers specified.

Locks and door trim	FF-H-106a
Shelf and miscellaneous	FF-H-111a
Hinges	FF-H-116b

b. Finish for hardware, except as otherwise specified, shall be:

US 9 or US 10 for hardware generally (one finish to a building)
US 26 for toilet and bathroom hardware
USP for hinges primed for painting

3. SAMPLES AND SCHEDULE

a. Samples of builders hardware proposed for use in the work shall be submitted to the Contracting Officer for approval before delivery of the hardware. Provide one sample each of every type specified or required. Hardware samples shall be properly identified as to type, number, and where it is proposed to be used. Hardware so identified may be installed in the buildings before completion provided the identification remains attached until acceptance of the buildings.

b. Schedule of hardware indicating type, number, location and finish of each item required shall be submitted by contractor for approval with the samples. The hardware schedule shall assign serial numbers to items which will be used to identify the packages of hardware items. Approval of hardware schedule shall be for type, operation and finish. The contractor shall be responsible for furnishing all necessary hardware items. After approval

supply 6 copies of the hardware schedule to the Contracting Officer for use and record.

4. KEYS AND KEYING

a. Locks shall be keyed differently unless otherwise specified. Cylinder locks of different changes shall be furnished with three keys each. Locks specified to be keyed alike in any system or set shall be furnished with one key for each lock, with a total of at least three keys for each set.

b. Die stamp each key with the number of lock change.

c. Bit key locks shall be provided with two keys each.

d. Six master keys shall be furnished for cylinder locks on the project. (No grand master key system will be required). Master keys shall be delivered to the Contracting Officer by the contractor upon completion and occupancy or acceptance of any of the dwellings in the project.

5. PACKING AND MARKING

Each lock set and item of hardware shall be packaged separately and shall be complete with necessary screws, key instructions and required templates. Each individual container shall be marked with corresponding item number from the hardware schedule identifying the contents and defining its location in the finished work.

6. BUTTS (HINGES)

Butts for doors 1-3/8 inch thick shall be 3-1/2 x 3-1/2 and for doors 1-1/8 inch thick they shall be 3 x 3. Exterior doors shall have 1-1/2 pairs of butts and interior doors 1 pair. Door butts shall be type 2014-1/2P.

7. LOCKS

Cylinder locks supplied under this division shall be the product of one manufacturer and the same restriction shall apply to bit key locks.

a. Rubs of cylinder knob locks for exterior doors shall be brass or bronze.

b. Cylinder rings of wrought bronze of proper size to fit door thickness shall be supplied.

c. Bit key mortise locks and mortise latches may have lock cases, fronts and strikes of the same external measurements to suit a standardized mortise for all dwelling unit doors.

d. Mortise, tubular or cylindrical locks and latches may be used. Lock sets shall be complete with escutcheons, knobs, roses and similar items as required and herein specified. Where two numbers are given under any one type

of lock, both pieces shall be provided. In lieu of locks specified, locks of manufacturers' stock design, similar in quality and function may be used subject to the approval of the Contracting Officer.

e. Lock Schedule

	Mortise	Tubular
Front and rear doors (keyed alike)	194-185	182A - 2B
Bedroom Doors	3D	2B
Bathroom doors	3B	2A
Storage doors and other doors not otherwise specified	194-185	182A - 2B

Series 160 cylindrical case lock and latch sets may be furnished in lieu of other lock and latch sets described herein where they provide substantially the same performance in operation and control and have substantially the same quality of construction and wrought trim as the lock and latch sets for which they are substituted.

Bathroom locks shall have an emergency access device and the locking mechanism shall release automatically.

f. Roses for locks and latches shall be Type 335 or 336 except as otherwise necessary for the operation of the lock or latch furnished.

(1) Cylindrical case lock and latch sets shall have roses that are standard for the manufacturer of the lock.

8. SHELF AND MISCELLANEOUS.

Hardware attached to flush hollow core doors, where blocking is not provided, shall be attached to the door by through bolts with sleeve nuts.

a. Door stops, Type F1323 or Type F1331, as required, shall be provided for all exterior and interior doors where the swing of the door will permit the door knob to strike the wall surface.

b. Six coat hooks, Type F1173 commercial finish, shall be provided for all closets except linen closets.

(1) One robe hook, Type F1173, shall be provided in each bathroom and toilet room.

c. Scuttle in ceiling to attic space shall be secured in place with two hook and eyes similar to Type 1601 with 2 inch hook length.

d. Cabinet C 5 in Series 1 buildings shall have 2 pair of 3 x 3 loose pin butts with the screws in the bottom leaf reversed.

e. Wood cabinets, and cabinet type doors of closets, shall be provided

with one pair of 2 inch wrought steel plated semi-concealed cabinet hinges for lipped doors and one pair of 2 inch full surface plated butts for panel doors. Doors over 4 feet high shall have 3 hinges. Friction catches for holding doors shall be Type F1073 or other types to suit conditions. Pulls for doors and drawers shall be Type F1307, one for each door and one for each drawer 20 inches or less wide; two for each drawer over 20 inches wide.

f. Double hung wood windows shall have sash fasteners, one to each pair of sash, crescent Type F1140 or as standard with a prefitted window manufacturer.

g. Screen and combination screen and storm doors shall have one pair of 3 x 3 butts, one chain door stop F1317, one No. 4 coil spring F1845 except galvanized, one 3 inch rust proofed steel hook and eye and one door pull F1274.

h. Letter drop shall be provided for each front door to each house. Letter drops shall have an opening of not less than 1½ x 7 inches with front and back plates of heavy gage wrought brass or steel primed for paint. Overall dimension shall be approximately 3 x 10 inches. Opening on outside plate shall be closed by a gravity hinged leaf providing weather protection. Door slots shall be installed not less than 30 inches from finished floor.

i. Cabinets and counters of wood (other than kitchen). Doors shall have one pair of 2½ inch butts 2018A. Locks for doors shall be brass or bronze wardrobe locks with 2 flat keys. Drawer locks shall be brass or bronze cabinet locks with 2 flat keys. Drawer pulls F1310, one for drawers less than 20 inches wide, 2 for other drawers. Doors shall have pulls Type F1307.

j. Casement sash shall have one friction type adjuster similar to Corbin 55, 10 inches long, one pull F1307, one casement window fastener similar to H. H. Ives Company, New Haven, Connecticut, Series 19, with not to exceed 3/4 inch projection, and one pair of butts 2014-1/2P, 3 x 3 inches.

k. Screens and storm sash for casement windows shall have two hangars each Stanley 1713 and one fastener each Stanley 1763. Screens and storm sash shall be interchangeable. Provide a wood block on window sill for mounting fastener for storm sash.

( ) Storm sash for double hung windows shall have one pair of storm sash hangers F1825; one storm sash in each room shall have a fastener set F1663 with a pull. Other storm windows shall have a pull and a pair of hooks and eyes as long as will fit between sash and storm sash.

DIVISION DHS 7
ASPHALT TILE

1. SCOPE.

Include asphalt tile flooring, composition base and items specified in this division required to provide asphalt tile floors in bathrooms.

2. MATERIALS.

Asphalt tile shall conform to Federal Specification SS-T-306a, 1/8 inch thick. Tile shall be 9 x 9 inches. Colors will be selected from color group B of Simplified Practice Recommendation R 225-47 issued by the Department of Commerce.

a. Colors shall be limited to two colors in one room with the darker color used for the border. The number of such color combinations will be limited to four selections.

b. Composition base shall be black, coved, set-on type, 4 inches high and 1/8 inch thick.

c. Adhesive for tile shall be a bituminous plastic cement, cut-back type or emulsion type; adhesive for base shall be a waterproof synthetic rubber cement or a waterproof resin base cement, as recommended by the manufacturer of the tile.

d. Edging strips to protect free edges of the tile shall be plastic or hardwood.

3. SAMPLES.

Samples of the following listed materials proposed for use in the work shall be submitted to the Local Authority for approval:

Floor tile.	4 pieces for each color type
Composition base.	2 pieces 24 inches long
Edging strip.	2 pieces 12 inches long

4. GENERAL REQUIREMENTS

a. General. Inspect the subfloor and do not lay any asphalt tile until wood underfloors are well nailed and free from holes, cracks, squeaks and springiness under foot traffic. Subfloors shall be scraped free from foreign material and cleaned. Any subfloors too rough for direct application of the asphalt tile shall have projections removed and depressions primed with emulsified asphalt thinned to a brushing consistency and filled with a mixture of 1 part of high early strength portland cement, 2 parts sand and 1 part of emulsified asphalt tempered with water to a plastic mortar as dry as can be placed. Allow filler to set hard.

b. Maintain temperature at least 70 degrees F. in place of storage prior to laying. In rooms where tile is to be laid, maintain temperature at least 70 degrees F. for 48 hours before and after tile is laid.

c. Installation shall not begin until the work of other trades in the area, including painting, has been completed.

d. Omit asphalt tile under showers and omit composition base against showers.

e. Apply asphalt tile over plywood subfloors without felt underlayment.

5. INSTALLATION

a. Spread adhesive with a trowel having triangular notches 1/16 inch deep and wide on 3/16 inch centers. Apply only enough adhesive to hold the tile without rising through joints between tile.

b. Lay tile when adhesive has set tacky, starting at the center of the room and working toward walls. Embed each tile in adhesive with closely fitted, straight, inconspicuous joints. Lay field tile with grain alternately reversed in a checkerboard pattern. Do not cut except at walls or obstructions. Beveled edging strips shall be installed where edges of tile are exposed.

c. Finished floors shall be smooth and free from buckles, cracks, breaks, waves, and projecting edges, and shall fit neatly at pipes and other installations and obstructions.

d. Install base on top of asphalt tile flooring with corners neatly fitted. Attach base to finish walls with adhesive spread evenly.

6. CLEANING AND WAXING

Clean tile and base with a neutral cleaner when tile has become well seated. Coat floors with a water emulsion and buff with a floor polishing machine.

DIVISION DHS 8

PAINTING AND GLAZING

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE USE OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

INCLUDE ON THE DRAWINGS COMPLETE INSTRUCTIONS FOR STREET AND BUILDING SIGNS AND HOUSE NUMBERS.

THE RANGE OF COLOR SELECTION SHOULD BE NARROWED FOR SMALL PROJECTS.

CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

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DIVISION DHS 8

PAINTING AND GLAZING

1. SCOPE

Include painting and glazing required to complete the project as indicated on the drawings and as specified. See General Scope of Work for extent of work.

a. Prefinished wall board shall not be painted if surface is maintained clean and in good condition.

2. GENERAL

The term paint, as used herein, includes emulsions, enamels, oil paints, sealers, stains, varnishes and similar coatings.

3. MATERIALS

Paint shall be well ground, shall not settle badly, cake or thicken in the container, be readily broken up with a paddle to a smooth consistency and have easy brushing properties. Paint shall be ready mixed except that thinning and tinting may be done on the job. The paint shall be suitable for spraying when thinned with not more than 12 per cent by volume of mineral spirits. Paint materials shall be delivered in the manufacturer's unopened containers with labels and tags intact. The use of specification symbols in this specification shall be understood to require a material conforming to the specification listed therewith.

4. GENERAL REQUIREMENTS

a. Maintain temperature of rooms where varnish or enamel is being applied at 70°F. or more and at 50°F. or more during other interior painting. Exterior painting shall be performed when the air temperature is 50°F. or higher and in drying weather.

b. Colors shall be as selected by the Contracting Officer but not over two colors for exterior for any building or six for the project; two colors for interior trim and two colors for interior walls for any building but not over six for the project. When prefinished wall board is manufactured in only one color, the color selection for walls shall be waived.

c. Doors and windows and trim in a room shall be painted one color not the same color as the walls unless specifically required.

d. Prime coated butts shall be painted to match the door to which they are attached.

e. Allow paint to dry hard between coats.

f. Wood sash shall have prime coat of TT-P-25 applied both sides before glazing.

g. Protect all work from damage by the use of drop cloths. Remove paint stains completely from finished work.

h. Paint unfinished exposed surfaces of plumbing fixtures 2 coats of paint as specified for interior woodwork.

i. Covering shall be complete. When color, stain, dirt, or undercoats show through the final coat of paint, the work shall be covered by additional coats until the paint is of uniform color and appearance and coverage is complete.

j. Hardware and accessories, fixtures and similar items placed prior to painting shall be removed or protected during painting and replaced on completion of painting.

k. Shelving shall be treated on the bottom and exposed edges as specified for interior wood trim.

l. Sand interior surfaces lightly between coats.

m. Furnish affidavits from manufacturers certifying that materials delivered to the project conform to the requirements of these specifications.

5. PREPARATION OF SURFACES

a. Surfaces to be painted shall be clean, dry and free from dirt and frost.

b. Cover knots and pitch streaks with orange shellac, aluminum paint or a resin sealer approved by the Contracting Officer.

c. Galvanized metal to be painted shall be cleaned with commercial pre-treating solution or a solution consisting of 4 ounces of copper sulphate in one gallon of water. Permit copper sulphate to dry on surface not less than 12 hours, and dust off with a stiff brush. Follow manufacturer's direction for pre-treating solutions.

6. EXTERIOR PAINTING

a. Exterior woodwork and exterior covering, including both sides of sash, storm sash for double hung windows, and combination and screen doors, shall be painted as follows:

1st coat Exterior primer	TT-P-25
2nd coat Exterior oil paint	TT-P-102, Class A for white paint and Class B for tinted paint

Both first and second coats shall be manufactured especially for 2 coat work. Spread at a rate of not to exceed 450 square feet per gallon for the first coat and 550 square feet per gallon for the second coat.

b. Exterior metal shall be painted as follows:

First coat on ferrous metal, red lead	TT-P-86a
First coat on galvanized metal, zinc dust zinc oxide	TT-P-641
Second coat exterior oil paint	TT-P-102

7. INTERIOR PAINTING

a. Interior doors, screens and storm sash for casement windows, trim and cabinets, exposed ceiling framing and bathroom walls shall be painted as follows:

First coat (not wood sash) primersealer	TT-P-56a
Second coat enamel undercoat	TT-E-543
Third coat semigloss enamel	TT-E-508

b. Walls, except for prefinished wallboard and except bathrooms shall be painted as follows:

One coat resin emulsion	TT-P-88a

Prefinished wallboard which has become soiled shall be cleaned or painted as for unfinished wallboard.

c. Floors, except prefinished flooring, shall be finished as follows:

Oak floors shall have a coat of wood filler TT-F-336a, tinted with stain as approved by the Contracting Officer, applied freely and wiped off across the grain. Finish with two coats of wood sealer TT-S-176a, Class 1 for soft-wood and Class 2 for hardwood, tinted as directed, applied freely and wiped off before sealer has set. Recoat any dull spots until floors have a uniform matt finish.

d. Upperside of shelving shall be treated the same as soft-wood flooring.

8. APPLICATION

Any required thinning of paint shall be done in compliance with the printed instructions of the manufacturer of the paint. A shop coat will be accepted in lieu of any priming coat required by these specifications. Work shall be done by skilled mechanics and shall be uniform in appearance, of approved color, smooth and free from runs, sags, skips and defective brushing. Make edges of paint adjoining other materials or colors, sharp and clean without overlapping except that paint shall overlap glass slightly. Should workmanship of finish be found defective proper preparatory work shall be done and additional coats applied as necessary to give a finish in accordance with specifications and color samples.

At completion, touch up and restore finish where damaged or defaced and leave in first class condition. Painted or finished surfaces cut in fitting or erection shall be restored.

9. PAINTED SIGNS AND NUMBERS

Provide house numbers of up to three 2 inch black letters stenciled on painted wood or metal plaques attached to houses near front door as directed or provide ceramic or metal house numbers of comparable visibility in place.

a. Street signs and signs on service buildings shall be provided of size, type and number as indicated on the drawings. They shall be of wood or metal with painted, stenciled, ceramic or metal letters.

10. GLAZING

a. Glaze windows and doors with SS-B clear glass except that lights over 240 sq. inches shall be DS-B clear glass.

b. Glaze windows in toilets and bathrooms with obscure glass 1/8 inch thick.

c. Putty for wood sash shall be white lead-whiting putting containing not less than 10 per cent white lead.

d. Affidavits from the manufacturers certifying that putty complies with the requirements of this specification shall be submitted to the Contracting Officer.

e. Glazing. Surfaces shall be dry and free from dust or ice before glazing. Dirty surfaces shall be cleaned with a cloth saturated with turpentine or mineral spirits before glazing. Putty shall not be applied in temperatures below 40°F or during damp or rainy weather. Do not glaze wood windows or doors until they have received a priming coat of paint as specified. Do not handle windows after glazing until the putty has set. Obscure glass shall be set with smooth side out.

(1) Bed glass completely in putty. Set with not less than 8 glaziers points. Apply face putty with sufficient pressure on the knife to insure complete adhesion to glass and rabbet. Cut off excess immediately after glass is bedded. Face putty shall be full, smooth, and with accurately formed bevels having clean cut miters.

(2) Putty shall be used as it comes from container without adulteration and only after thorough remixing. If thinning is required, use only white gasoline and not more than one tablespoon per gallon of putty.

(3) Doors shall have glass completely bedded in putty and set with glazing beads.

(4) Ventilate building after glazing by opening windows slightly top and bottom sufficient to prevent condensation of water on the glass and bed putty. Maintain such ventilation until glazing compound or putty has set.

f. Clean glass on both sides after painting is complete and dry. Do not disturb putty with scrapers. Do not use acid solutions or water containing caustic soaps. Broken, cracked and glass not complying with these specifications shall be replaced. At completion of work, glass, putty and other glazing materials shall be clean, whole, and in perfect condition.

DIVISION DHS 9

SHADES

1. SCOPE

Include window and door shades and items included in this division with accessories required to complete the project. See the drawings and General Scope of Work for location and extent of work.

a. Furnish and install shades for windows and glazed doors in dwelling units and for windows of any administration buildings. Where multiple windows are shown, provide each unit with a separate shade. Provide one shade for each pair of casement windows. None for bathroom.

b. Furnish and install curtain rods at windows of dwelling units.

2. MATERIALS

a. Shade cloth shall be holland shade cloth or pyroxylin-impregnated shade cloth of color as selected by the Local Authority from the manufacturer's standard colors.

b. Shades, rollers, slats, cords and accessories shall conform to Federal Specification DDD-S-251a and be equipped with ring pull. Shades shall be installed on face of window trim and on face of doors and overlap glass not less than one inch on all edges.

(1) Shade brackets for doors and windows shall be first quality manufacturer's standard.

c. Curtain rods shall be manufacturer's standard telescoping type not less than 3/4 inch deep, made up of not less than .014 inch thick steel painted with an ivory or near white enamel. Casement windows shall have one rod for each pair of sash and a center support. Double hung windows shall have one rod for each window. Curtain rods without center support shall lap at least 10 inches in center.

3. SAMPLES

Samples of materials proposed for use in the work as listed below shall be submitted to the Local Authority for approval:

Shades	2
Curtain rods	2

4. INSTALLATION

a. Shade and curtain rod brackets shall be securely fastened with suitable screws.

b. Shades and curtain rods shall be placed square and level, and in accordance with best trade practices.

c. Leave shades and curtain rods in perfect working order, free from defects.

DIVISION DHS 10

SUSPENDED CHIMNEYS

1. SCOPE

Include suspended chimneys and related items for family dwellings and service buildings included in the contract. See General Scope of Work for location and extent of work.

2. MATERIALS AND ASSEMBLY.

Chimneys shall be listed under the reexamination service of the Underwriters' Laboratories, Inc., for coal, oil and gas fuels, and shall be installed in accordance with their recommendations. Chimney shall bear Underwriters Laboratories label.

The chimney shall be suited to the space conditions indicated on the drawings, and shall be fitted with an approved means of flashing to the roof.

Flue pipe shall be 7 inches diameter and shall extend to a point 4 feet above roof line, exclusive of cap. The flue pipe shall be adapted to suit the connections from the necessary equipment.

Submit drawings for approval before proceeding.

DIVISION DHS 11

PLUMBING

NOTES TO THE ARCHITECT OR ENGINEER:

THESE NOTES ARE FOR THE INFORMATION OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THE DRAINAGE AND VENT SYSTEMS ARE WRITTEN TO INCORPORATE THE REQUIREMENTS SET FORTH IN THE "REPORT OF THE COORDINATING COMMITTEE FOR A NATIONAL PLUMBING CODE" ISSUED JOINTLY BY THE U. S. DEPARTMENT OF COMMERCE AND THE HOUSING AND HOME FINANCE AGENCY. THIS REPORT IS FOR SALE (PRICE 50 CENTS) BY THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

HOWEVER, ATTENTION IS DIRECTED TO THE STANDARDS FOR TEMPORARY DEFENSE HOUSING IN WHICH IT IS NOTED THAT STATE AND LOCAL LAWS AND REGULATIONS RELATIVE TO HEALTH AND SANITATION MUST BE MET UNLESS WAIVERS TO UNDULY RESTRICTIVE REQUIREMENTS ARE OBTAINED. HENCE, THE DRAWINGS AND THESE SPECIFICATIONS FOR THE SANITARY PLUMBING SYSTEM MAY NEED MODIFICATION IN ORDER TO COMPLY WITH THESE REQUIREMENTS.

THE SPECIFICATIONS ARE WRITTEN ALSO TO INCLUDE THE USE OF GAS PURCHASED FROM THE LOCAL UTILITY COMPANY FOR ONE OR MORE OF THE UTILITY SERVICES. SECTION 17, SUBPARAGRAPH a, IS BASED ON THE WHOLESALE PURCHASE OF GAS. SHOULD THERE BE RETAIL PURCHASE, IT MAY BE NECESSARY TO DELETE THE SUBPARAGRAPH ENTIRELY AND REWRITE IT TO SUIT INSTALLATION OF GAS PIPING UP TO A METER (BOTH PIPING AND METER FURNISHED AND ERECTED BY THE GAS COMPANY).

THERE MAY BE CASES WHERE LIQUEFIED PETROLEUM GAS SUCH AS COMMERCIAL PROPANE OR COMMERCIAL BUTANE MAY BE PURCHASED FOR USE IN ONE OR MORE OF THE UTILITY SERVICES. UNDER THESE CIRCUMSTANCES, IT WILL BE NECESSARY TO DELETE THE APPLICABLE SECTIONS HEREIN, AND PREPARE A SPECIFICATION FOR AN INDIVIDUAL DOMESTIC SYSTEM (ONE OF TWO 100 LB. TANKS FOR EACH FAMILY UNIT) OR BULK SYSTEM FOR THE ENTIRE PROJECT. IN EITHER CASE THE SPECIFICATION REQUIREMENTS SHOULD BE WRITTEN TO INCORPORATE THE "STANDARDS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS FOR THE DESIGN, INSTALLATION AND CONSTRUCTION OF CONTAINERS AND PERTINENT EQUIPMENT FOR THE STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES" (NBFU PAMPHLET NO. 58). THE NATIONAL BOARD OF FIRE UNDERWRITERS HAVE OFFICES AT 85 JOHN STREET, NEW YORK, NEW YORK, 222 WEST ADAMS STREET, CHICAGO 6, ILLINOIS, MERCHANTS EXCHANGE BUILDING, SAN FRANCISCO 4, CALIFORNIA.

THIS SPECIFICATION MUST BE ADAPTED TO SITE, SOIL AND CLIMATE CONDITIONS. CHANGE THE TEXT AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

FOR EXAMPLE, THE SPECIFICATIONS INCLUDE ITEMS FOR GAS AND ELECTRIC DOMESTIC WATER HEATERS, NECESSARY DELETIONS MUST BE MADE. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN AS INDICATED ON THE DRAWINGS.

DIVISION DHS 11

PLUMBING

1. SCOPE

Include all plumbing work and related items for dwelling units and for service buildings. All plumbing work shall conform to the requirements in the Report of the Coordinating Committee for a National Plumbing Code issued jointly by the U. S. Department of Commerce and the Housing and Home Finance Agency. 1/ Work shall include but is not limited to the following:

a. Drainage systems within the buildings and to five feet outside the buildings, including connections to the outside sewerage lines.

b. Hot and cold water systems within the buildings and cold water supply to five feet outside the buildings, including connections to the cold water distribution system.

c. Plumbing fixtures and trim including the setting of fixtures and their connection to the drainage and water supply systems.

d. Gas piping systems within the buildings and to five feet outside the buildings, including connections to outside gas distribution lines and to all gas appliances and equipment. Gas piping shall conform to the regulations of the local utility company.

2. MATERIALS

Materials shall be new and shall conform to the Federal Specification or other standard listed with each item, as follows:

a. Pipe and fittings shall conform to the following:

(1) Cast-iron soil pipe and fittings - Federal Specification WW-P-401

(2) Cast-iron screwed fittings - Federal Specification WW-P-501b

(3) Cast-iron drainage fittings - Federal Specification WW-P-491a

(4) Malleable-iron screwed fittings - Federal Specification WW-P-521b

(5) Copper tubing - Federal Specification WW-T-797 or WW-T-799a

1/ For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., price 50 cents.

(6) Soldered joint fittings - American Standard A 40.3

(7) Lead pipe - Federal Specification WW-P-325

(8) Wrought-iron pipe - Federal Specification WW-P-441a

(9) Steel pipe - Federal Specification WW-P-406

b. Underground soil, waste and drainage piping within the buildings and to five feet outside the buildings shall be cast-iron soil pipe and fittings, extra heavy or service weight.

c. Above ground soil, waste and vent piping shall be:

(1) Service weight cast-iron soil pipe and fittings, for piping two inches and larger except as otherwise noted on drawings.

(2) Standard weight galvanized steel pipe with cast-iron drainage fittings (standard galvanized cast-iron or malleable-iron steam pattern fittings for vent piping only), for piping smaller than 2 inches.

(3) Lead traps and bends for waste only.

d. Water piping shall be any of the following:

(1) Copper tubing, Type L exterior and Type M interior with wrought-copper solder-joint fittings.

(2) Standard weight galvanized wrought-iron pipe with standard galvanized cast-iron or galvanized malleable-iron beaded screwed fittings.

(3) Standard weight galvanized steel pipe with standard galvanized cast-iron or galvanized malleable-iron beaded screwed fittings.

(4) Standard weight galvanized wrought-iron pipe with standard galvanized cast-iron or malleable screwed fittings.

(5) Standard weight coated cement lined steel pipe with coated cement lined malleable-iron beaded screwed fittings.

e. Valves 3/4 inch and smaller shall be globe or gate valves; larger sizes shall be solid wedge type gate valves. Valves shall be brass or bronze with screwed ends except those used in connection with copper tubing which may have soldered (sweat) type ends or appropriate adapters. Check valves shall be the horizontal swing type with hinged check and ground seat. All valves shall be the 125-lb. type that can be repacked under pressure when wide open. Bronze check and globe valves shall conform to Federal Specification WW-V-51a; bronze gate valves shall conform to Federal Specification WW-V-

f. Unions

(1) For iron and steel piping. Unions shall be 150-lb. malleable-iron unions with brass seats.

(2) For copper tubing. Unions shall be 125-lb. brass ground joint type.

g. Gaskets

(1) For fixture outlets to floor flanges. Gaskets shall be soft asbestos with graphited finish conforming to Federal Specification HH-G-116.

h. Jointing Compounds

(1) Threaded and flanged jointing compound shall be made up of pipe cement and oil or graphite and oil.

(2) Fixture setting compound shall conform to Federal Specification HH-C-536.

(3) Hot poured jointing compound shall be of a type that will not soften sufficiently to destroy the effectiveness of the joint at 160°F, nor be soluble in any of the wastes normally carried by the drainage system, and shall conform to Federal Specification SS-C-608.

i. Lead

(1) Calking lead shall conform to Federal Specification QQ-L-156.

(2) Lead traps shall conform to Federal Specification WW-P-325.

j. Packing for hub and spigot joints shall be twisted jute conforming to Federal Specification HH-P-117, or hemp conforming to Federal Specification HH-P-106b.

k. Cleanouts shall have bodies that conform in thickness to that required for the pipe with which they are installed. They shall extend not less than 1/4 inch above the hub if installed with soil pipe. The cleanout plug shall be of brass or iron not less than 1/8 inch thick and shall be provided with raised nut or recessed socket for removal. Cleanouts shall conform to Federal Specification WW-P-401.

l. Nipples shall be the same material as the pipe or tubing with which they are installed. Ferrous nipples shall be extra strong when the unthreaded portion is less than one inch long, and nipples shall conform to Federal Specification WW-N-351.

m. Floor flanges for plumbing fixtures shall be not less than 3/16 inch thick cast-iron or galvanized malleable-iron, or not less than 1/8 inch thick brass or hard lead. Floor flanges shall conform to Federal Specification WW-P-541a.

n. Plumbing fixtures, trimmings and related items, such as sillcocks, supplies, escutcheons, traps, and floor drains shall conform to Federal Specification WW-P-541a.

(1) Sillcocks shall be brass with hose end, and wall flange or shoulder shank at exposed connections.

o. Formed-metal plumbing fixtures shall comply with Federal Specification WW-P-542a.

p. Pipe covering and insulation

(1) Wool felt for cold water pipe insulation shall be 3/4 inch preshrunk with asphalt-saturated felt liner and cotton sheeting jacket, and shall conform to Federal Specification HH-I-567.

(2) Asbestos air-cell for hot water pipe insulation shall be 3 ply preshrunk with cotton sheeting jacket, fabricated in corrugated plies, each ply being approximately 1/4 inch thick and shall conform to Federal Specification HH-I-561b.

(3) Asbestos cement shall consist of ground asbestos fibre and other fireproof insulating materials which shall be mixed with water to consistency of mortar and applied with a trowel.

(4) Hair felt shall be the insulating type, conforming to Federal Specification C-F-202. Mineral wool shall conform to Federal Specification HH-I-521c, Type II.

q. Calking ferrules shall be of red-brass pipe conforming to Federal Specification WW-P-351, or cast iron pipe.

r. Soldering nipples and bushing shall be standard red-brass pipe conforming to Federal Specification WW-P-351.

s. Soft solder shall be composition Sn50 or Sn35 conforming to Federal Specification QQ-S-571b. Flux shall be the non-corrosive type conforming to Federal Specification O-F-506.

t. Coal-tar enamel shall conform to American Water Works Association Standard 7A.6.

u. Hangers for horizontal piping such as water or gas shall be solid or split type, black ferrous for steel or wrought iron piping and copperized

steel or copper for copper tubing. Hangers shall be fastened to building construction with steel or iron rods for ferrous piping and copperized rods for copper tubing.

v. Gas pipe and fittings shall be standard weight black steel or wrought iron pipe with standard malleable-iron fittings.

3. EXCAVATION AND BACKFILL

Excavate trenches to required depths for underground pipes. Where rock is encountered, excavate to a grade 3 inches below the lower most part of pipe. Brace and pump trench, if necessary. After test, backfill trench to grade, tamp or puddle earth compactly in place. Install piping below frost line, with drainage piping under level of adjoining water piping.

4. DRAINAGE LINES

a. Horizontal drainage piping shall have a uniform grade not less than 1/4 inch per foot. Pipes passing through or under corrosive material such as cinders or cinder concrete shall be protected with a heavy coat of coal tar enamel.

b. Changes in direction in drainage piping shall be made by 45° wyes, half wyes, or long sweep quarter, sixth, eighth, or sixteenth bends. Sanitary tees or short quarter bends may be used on vertical stacks or drainage lines where the change in the direction of flow is from the horizontal to the vertical; except that long-turn TYs shall be used when two fixtures are installed back to back and have a common drain. Straight tees, elbows, and crosses may be used on vent lines.

c. Floor drains shall be cast-iron with grating cover and P-trap.

5. JOINTS AND CONNECTIONS

a. Calked joints for cast-iron soil pipe shall be firmly packed with oakum or hemp, and filled in one pouring with molten lead not less than 1 inch deep.

b. Threaded joints shall be made with a lubricant on the male thread only. Remove all burrs and cuttings.

c. Floor connections for water closets and other fixtures shall be made with a hard lead, or iron flange, calked, soldered or screwed into the drainage pipe. The connection shall be bolted, with a gasket or setting compound between the fixture base and the connections.

d. Soldered joints shall have the tube and fitting cleaned bright and fluxed. The joint shall be heated sufficiently to make a tight connection.

e. Hot poured joints shall be made between cast-iron soil pipe and vitrified clay or concrete sewer pipe. The joint shall be made by calking the joint opening with jute or hemp packing and then filling it with hot jointing compound at one pouring.

f. Wiped joints for lead pipe and fittings or between lead piping and brass or copper pipes, ferrules, solder nipples or traps shall be full-wiped joints. Such joints shall have an exposed surface on each side of the joint not less than 3/4 inch wide and at least as thick as the material being jointed. Wall or floor flange wiped joints shall be made by using a lead ring or flange placed behind the joint at the wall or floor. Joints between lead and cast-iron, wrought-iron or steel pipe shall be made by means of wiped joints to the calking ferrule, soldering nipple, or bushing.

g. Lead burned (welded) joints shall be lapped and the lead shall be fused together to form a uniform weld at least as thick as the pipe being joined.

h. Slip joints and unions shall be used only in the waste pipe between a trap seal and a fixture.

6. TRAPS AND CLEANOUTS

a. Fixture traps shall be installed on every plumbing fixture except those having integral traps. A combination fixture need have only one trap, if one compartment is not more than six inches deeper than the other and the waste outlets are not more than 30 inches apart.

b. Type of fixture trap shall be water-seal, self-cleaning P or drum trap as herein specified. Each trap, except integral traps or those that are readily removable shall have an accessible brass cleanout of ample size, protected by the water seal.

c. The nominal size of each fixture trap shall be the same as the fixture drain to which it is connected. The size of the fixture drain for fixtures with integral traps shall not be smaller than the fixture outlet. In any case, the minimum size of the trap and fixture drain shall be not less than the following:

Water closet	3 inches
Lavatory	1-1/4 "
Kitchen sink	1-1/2 "
Laundry tray	1-1/2 "
Stall shower	2 "
Floor drain	3 "

d. Cleanouts shall be installed where shown and be of same size as pipe to which connected.

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7. SLEEVES AND ESCUTCHEONS

a. Sleeves shall be installed around all piping passing through walls, slabs, partitions, or other building construction. Sleeves placed horizontally shall be standard weight pipe one size larger than the pipe; those placed vertically shall be 26 gage galvanized sheet steel. Sleeves passing through exterior walls shall be made water-tight with calking compound.

b. Escutcheons shall be installed around all exposed pipe passing through a finished floor, wall or ceiling. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe.

8. HANGERS

a. Hangers shall support the piping in place and provide for expansion and contraction.

b. Hanger Spacing

(1) Steel pipe supports shall be spaced at not more than 10-foot intervals.

(2) Copper tubing supports shall be spaced at not more than 6-foot intervals.

(3) Soil stack at base and water closet connection to stack, 3 feet or over in length, shall be supported.

9. FLASHINGS

Pipes extending through roof shall be flashed watertight with hard sheet lead 2.5 lbs. per square foot, or soft lead 3 lbs. per square foot or galvanized sheet metal not less than No. 26 U. S. Standard Gauge. Extend flashing not less than six inches around pipe and terminate as shown.

10. WATER SUPPLY

a. Size of fixture supplies shall be as indicated on the drawings, but shall in no case be less than the following:

	Cold Water	Hot Water
Water closet (tank type)	3/8 inch	- - - - -
Lavatory	3/8 inch	3/8 inch
Kitchen sink	1/2 inch	1/2 inch
Laundry tray	1/2 inch	1/2 inch
Hose bibb or sillcock	1/2 inch	- - - - -

b. Stop valve shall be installed in accessible location within each dwelling or as otherwise indicated. Stop valve shall be in tile box located approximately two feet from outside wall; extend box to grade and fit with cap set in mastic.

c. Unions shall be installed at the connections to water heaters.

d. Sillcocks shall be installed approximately 18 inches above grade, flush with the building wall at locations shown on the drawings.

e. Insulating connections shall be installed between copper tubing and steel water storage tanks.

f. Sprinkler head shall be Underwriters' Laboratories, Inc. approved type, shall open at the prescribed temperature and be installed where shown.

11. INSULATION

a. Hot and cold water piping shall be insulated when located in the following spaces:

(1) Laundry

(2) _____

(3) _____

b. Fittings of insulated piping shall be covered with asbestos cement to the same thickness as adjacent pipe covering and be jacketed with cotton sheeting.

c. Pipe covering shall be pasted in place and have metal bands spaced not more than 18 inches on centers and at each fitting. One tablespoon of bluestone shall be added to each gallon of paste.

d. Tile box outside building wall shall be packed with hair felt or rock wool.

e. Wood box under bathroom shall be packed with mineral wool.

12. PLUMBING FIXTURES

The best quality of plumbing fixtures and trim shall be provided, fabricated by a manufacturer of established reputation.

a. Fixture trim, traps, faucets, escutcheons and waste pipes that are exposed to view in finished spaces shall be brass with polished chromium plating over nickel finish, unless otherwise noted. Exposed supplies shall be brass pipe or copper tubing plated in the same manner, unless otherwise

noted. All faucets shall have metal indices, be of one pattern or design, be compression type with replaceable seats, and be the same size as the supply pipes to the fixtures.

b. Faucet locations shall be uniform, with cold water faucet on the right side of the fixture and hot water faucet on the left side.

c. Air gaps shall be provided between the level of each supply opening (except for outlets protected by vacuum breakers) and the flood rim of the fixture receptacle. The minimum required air gap shall be at least twice the diameter of the effective opening of the supply fitting but in no case less than the air gaps specified in the Plumbing Code mentioned herein.

d. Supports for wall-hung fixtures shall be metal brackets secured to walls or partitions with bolts or screws (4 for each lavatory and 8 for each sink-tray combination fixture.)

e. Water closets shall be white vitreous china with integral flush rim, regular front, seat post holes, pedestal base, and floor outlet, all moulded in the ware. A floor flange, brass bolts and chromium-plated nuts with china caps shall be provided. Closet shall be set on a gasket or on fixture setting compound.

(1) Each water closet shall have a low wall-hung tank of white vitreous china with a capacity of not less than six gallons. The tank cover shall have a flat top surface with slightly raised bead at the edges. The supply and flush valve shall be first quality brass, equipped with a vacuum breaker, and operated by a trip lever. Water closet bowls shall be reverse trip with jet or washdown with jet and shall flush and refill properly with not more than 3-1/2 gallons of water. The flushing action of the bowl shall be continuous with no break in the siphoning, and the trapway shall pass a solid ball 1-1/2 inch in diameter.

f. Water closet seats for dwelling units shall be white closed-front type with cover, with two rubber bumpers on the seat and on the cover. Hinges shall be chromium plated brass; seats shall be any of the following:

(1) Sheet covered type consisting of a hardwood or molded plastic core covered with an adherent covering of polished sheet pyroxylin not less than 0.012 inches thick and without openings, crevices, or evident joints. Wood seats shall be reinforced with wood or steel dowels.

(2) Solid plastic type molded from acid and alkali resistant plastic material, solidly built and sufficiently strong at the hinges. Finish shall be uniform without visible joints, cracks or seams.

(3) Sprayed-finish type consisting of a hardwood or molded plastic core finished with pyroxylin lacquer or pyroxylin enamel not less than 0.008 inches thick. Hardwood seats shall be reinforced front and back with wood or steel dowels.

g. Water closet seats for public toilets shall be black open front type without cover, of molded hard rubber with or without a core. The molded rubber shall be homogenous without seams, joints or crevices. There shall be two rubber bumpers on the front of the seat.

h. Lavatories shall be white, wall hung type, nominal dimensions 18 inches by 15 inches, with oval, rectangular or D-shaped bowl, and apron and back. The fittings shall consist of a combination center-set supply, a drain with cross-bars, 1-1/4 inch tail piece, beaded chain and chain stay with rubber stopper, P-trap, supplies and escutcheons. The combination supply shall include a short mixing spout and faucets with lever handles. The supply pipes and trap when roughed in 22 inches or more above the floor need not be chromium plated. Lavatories shall be made of cast iron, acid resisting porcelain-enameled, or formed steel, acid resisting porcelain-enameled.

i. Kitchen sink shall be the type suited for installation in cabinet, 24 inches by 18 inches and not less than 6 inches deep, with end outlets. The finish shall be acid-resisting porcelain enamel. The fittings shall include a combination center-set faucet with swing spout set on sink cabinet top, strainer and tail piece with P-trap. The sink shall be cast-iron porcelain enameled or formed steel, porcelain enameled.

j. Shower compartments shall have nominal dimensions of 36 x 30 inches, constructed of bonderized metal not less than 20 gage (.0359 inches) finished with manufacturers' standard color as selected by the Contracting Officer. Receptor shall be manufacturers' standard, metal, terrazzo or concrete. Entire assembly shall be guaranteed watertight for one year from completion.

(1) Calking compound shall be provided and placed at all joints to make a water tight assembly.

(2) Curtain rod at entrance shall be type furnished as standard with compartment. Rod at rear shall be corner type fitted with flanges and be secured as indicated. Curtain at entrance and at rear shall be of white duck, preshrunk (8 ounce double filled), bleached, and finished. Curtain at entrance shall be 6" longer and wider than opening and at rear shall extend 6" below window frame. Furnish necessary hooks.

(3) Drain and strainer shall be galvanized ferrous metal and shall be fitted to receptor at factory. Drain shall be 2" IPS inside calked connection. Strainer shall be removable type and secured with not less than two screws.

(4) Combination supply fitting with union connection.

(5) Valve fitting may be arranged for exposed or concealed connections of supplies and riser, and shall be tapped for top connection.

(6) Riser shall be 1/2" iron pipe size and terminate to form a 60 degree bend arm onto which shower head shall be screwed. Shower head shall point to corner of shower forming a 60 degree angle, and shall be of the water saving type.

k. Laundry trays shall be concrete, soapstone, or alberene stone, double compartment type, 48 inches by 24 inches nominal dimensions, supported on galvanized steel angle frame. The supply fittings shall consist of faucets with metal lever handles, soap dish, swing spout with hose end, and bracket and clamps for attaching the fittings to the tray. The drain fittings shall be drain plugs with cross-bars, twin drains, brass coupling nuts, tail piece and P-trap. A chain, chain stay and a rubber stopper shall be provided for each compartment. All trim shall have a rough plated finish.

13. PROTECTION DURING CONSTRUCTION

a. Plumbing fixtures and trim shall be protected against damage or injury. All fixtures damaged by any cause, and any trim with marred or scratched finish, shall be replaced at no additional cost to the Government.

b. All pipe openings shall be closed with wood plugs or caps during construction. The plugs or caps shall be installed when the pipe is roughed in and shall not be removed until final connection is made.

14. DOMESTIC WATER HEATING

a. Tanks for individual water heaters shall have a nominal capacity of 20 gallons for one-bedroom dwellings and 30 gallons for two or three bedroom dwellings and 45 gallons for laundry building (DHT - Series 1). Sizes for other buildings, where required, are shown on drawings. The tanks shall be designed for 127-1/2 pounds per square inch working pressure and shall have been tested to 300 pounds per square inch hydrostatic pressure without visible change of shape or distortion. The tank shall be insulated with the specified thickness of mineral wool, or equivalent insulation, applied around the tank and encased in an enamel-finished steel jacket. Tappings shall be 3/4 inch IPS minimum. The tank shall have a drain valve at its lowest point.

(1) A pressure and temperature relief valve shall be provided at the highest point of the tank or not more than 3 inches from the top of the tank, and there shall be no check valve or shut-off valve between the relief valve and the tank. The relief valve shall be brass or bronze and shall conform to the requirements of the American Gas Association (as specified in American Standard ASA Z21.22 - 1935). The valve shall open at 125 pounds per square inch or at any temperature between 200° and 210° F, and close and reseat itself at a lower pressure or at a temperature of approximately 160°F. The rate of discharge of the valve at any heat input into the tank shall be sufficient to limit the water pressure rise to 137½ pounds per square inch and to prevent any rise in water temperature above 210° F. A discharge pipe equal in cross-sectional area to that of the relief valve discharge outlet shall extend from the valve outlet as shown on drawings.

(2) Tank shell shall be constructed of either of the following:

(a) Galvanized steel, hot dipped inside and out in molten zinc fabrication. A magnesium anode rod, extending approximately the full length of the tank, shall be installed in each tank, and be of the type easily removable from the top of tank.

(b) Porcelain enamel lined (glass lined) steel. The construction and finish shall be in accordance with Commercial Standard CS115-44, "Porcelain Enamel Tanks for Domestic Use." issued by the National Bureau of Standards.

b. Individual automatic gas-fired water heaters, combined with individual storage tanks of specified size and construction, shall be the automatically controlled type, arranged for venting, in which a vertical hot water storage tank and gas burner are combined in one unit and encased in a metal jacket. The unit shall be listed by the American Gas Association and shall bear the AGA label. The unit shall be provided with draft hood, gas valve, pilot light, orifices and all necessary automatic controls, including fixed or adjustable locking type thermostat to operate burner on and off between 130° and not over 145° F. The gas valve and pilot shall be provided with means for manual shut-off. On heaters using natural or manufactured gas, the pilot shall shut off the supply of gas to main burner on flame failure. On heaters using liquefied petroleum, propane-air or butane-air gas, the pilot shall shut off the supply of gas to main burner and pilot burner on flame failure. Tank insulation shall be not less than one inch thick.

(1) The AGA input per hour of automatic gas-fired water heaters for dwelling units shall be not less than the following: For a water heater with a 20 gallon tank, 20,000 Btu; for a water heater with a 30 gallon tank, 24,000 Btu. For laundry building (Series 1) the AGA input per hour shall be not less than 40,000 Btu. Inputs for other tanks are shown on drawings (where required).

(2) Smoke pipe shall be No. 24 gage (thickness 0.0239 inches) black steel with gas-tight joints. Size shall be same as outlet on heaters; extend pipe and connect to chimneys; allow for expansion in vertical run. Where pipe passes through combustible construction, a metal ventilated thimble, not less than four inches larger than the smoke pipe, and constructed of No. 26 gauge steel, shall be installed around the pipe.

c. Individual automatic electric water heaters, combined with individual storage tanks of specified size and construction shall be the automatically controlled type in which a vertical hot water storage tank and two readily removable heating elements are combined in one unit and encased in a metal jacket. The unit shall be listed by Underwriters' Laboratories, Inc., shall bear their label, and shall conform to the National Electrical Manufacturers Association standard as specified in NEMA Publication No. 45-104. Current characteristics shall be 120 volts, 2 wire, 60 cycle. The

unit shall be provided with thermostat and other electric controls so wired that only one heater element will function at one time. The thermostat shall be the fixed or locking type operating between 130° and not over 145°F. Wiring and controls shall be installed behind easily removable panels in the outer jacket and be completely protected from accidental contact. There shall be a heat trap in the hot water connection to the tank. Tank insulation shall be not less than 2-1/2 inches thick. Wiring and electrical connections from electrical source to tank are included in the Division "Interior Electrical Wiring."

(1) Heater element shall be the immersion or band type and shall have the following wattages: for 20 or 30 gallon tanks, the top element shall have 1000 watt rating and the bottom element 600 watt rating. Elements for larger tanks (where required) are shown on drawings.

15. CLEANING UP

All piping, hangers, fixtures and trimmings and all equipment shall be thoroughly cleaned. All parts of the plumbing system and all equipment shall be adjusted and put in operating condition.

16. TESTS

The Contractor shall notify the Contracting Officer (in writing) three working days before the tests are to be made. Concealed work shall remain uncovered until required tests have been completed, but if necessary tests on portions of the work may be made and those portions of the work may be concealed after being proved satisfactory. All tests shall be made in the presence of the Contracting Officer. Repairs of defects shall be made with new materials. Calking of screwed joints, cracks, or holes will not be accepted. Tests shall be repeated after defects have been eliminated.

a. Drainage system tests

(1) A water test shall be applied to all parts of the drainage systems before the pipes are concealed or fixtures are set in place. The test may be applied in sections. All openings of each system to be tested shall be tightly closed except the highest opening above the roof, and the entire system shall be filled with water up to the overflow point of this highest opening. All parts of the system shall be subject to not less than 10 feet of hydrostatic head. The water shall remain in the system for not less than 15 minutes after which time no leaks at any joint or lowering of the water level at the overflow shall be visible.

(2) In lieu of a water test, an air pressure test shall be applied to all parts of the drainage systems before the pipes are concealed or fixtures set in place. With all openings tightly closed, air shall be pumped into each system until the pressure within the system is not less than 10 inches of mercury or 5 pounds per square inch above atmospheric pressure. The air pressure shall remain constant for not less than 15 minutes with no further pumping of air into the system.

(3) A smoke test shall be applied to all parts of the drainage systems after all fixtures have been permanently connected and all traps filled with water. A thick penetrating smoke produced by one or more smoke machines (not by a chemical mixture) shall be introduced into each system through a suitable opening. As smoke appears at each stack opening on the roof, the opening shall be closed off and introduction of smoke continued until a pressure of one inch of water has been built up and maintained for 15 minutes within the system. Under this pressure smoke shall not be visible at any joint, connection or fixture.

(4) In lieu of smoke test, a peppermint test shall be applied to all parts of the drainage systems after all fixtures have been permanently connected and all trap seals filled with water. A mixture of two ounces of oil of peppermint to one gallon of hot water shall be poured into each roof opening of each system and these openings shall then be tightly closed. There shall be no odor of peppermint within the building or at any joint, connection or fixture opening as a result of the peppermint mixture having been introduced into the system.

b. Water supply system tests

(1) A water pressure test shall be applied to all parts of the water supply systems before the piping is concealed or before the fixtures are connected. A hydrostatic pressure of not less than 100 pounds per square inch shall be applied to the system, and there shall be no leaks at any point in the system at this pressure.

(2) In lieu of water pressure test, an air pressure test shall be applied to all parts of the water supply systems before the piping is concealed or before the fixtures are connected. With all openings tightly closed, air shall be pumped into the system until the pressure within the system is not less than 35 pounds per square inch above atmospheric pressure. With no further pumping of air into the system, the air pressure shall not drop more than two pounds per square inch in 15 minutes.

c. Gas piping system tests shall be made in accordance with the rules and regulations of the utility serving the project. However, if no such rules exist or if the test pressure to be used is less than 10 pounds per square inch, the entire gas piping system shall be tested as follows: Air shall be pumped into the system until the pressure reaches 10 pounds per square inch or 20 inches of mercury above atmospheric pressure as read on a mercury column gage. This pressure shall remain constant for not less than 15 minutes with no further pumping of air into the system.

17. GAS SYSTEM

a. Service entrance installation of gas to buildings with enclosed under floor spaces (from underground gas distribution) of gas piping shall be constructed as follows: A gravel pit containing coarse gravel not less than 3/4 inch

in size shall be provided at the outer building walls at the depth of each gas service entrance. Each gravel pit shall be 3 feet wide and 16 inches thick, and shall extend out from the building wall a distance of two feet. The gravel shall be placed so that there is four inches of gravel below the gas piping and twelve inches above, and the bottom of the pit shall slope away from the building wall. Before entering building, each gas line shall make a two foot long swing joint at the building and then shall rise above grade. The gas piping above grade (only where manufactured or mixed natural manufactured gases are used), shall be frost-proofed with hair felt, wired in place and protected by a No. 24 gage sheet metal box with louvred sides. A sleeve and pipe guide shall be installed where the piping passes through the building wall and both ends of the sleeve opening shall be calked with calking compound. A vent pipe shall be installed for each gravel pit at the building wall. The vent shall be a coated 1-1/2 inch black steel pipe extending from six inches below the top of the gravel to one foot above grade. The vent pipe shall be fastened to the building with metal pipe straps and the top of the vent shall terminate in an open, down turned gooseneck placed parallel to the building and closely adjacent to it.

b. Gas fired equipment will be delivered and placed within 3 feet of its final position when specified in other Divisions. Such equipment and equipment furnished under this Division shall be placed in final position and connected up to the gas piping. A shut-off cock, wing lock or ground key type, shall be installed in the gas line at each piece of gas equipment. Between each shut-off cock and the equipment, a union, or nipple and coupling shall be installed to permit disconnection of the gas appliance.

c. Insulating fittings shall be placed in the gas piping at each service entrance. Paint gas service pipe up to point where pipe enters into building with a heavy brush coat of coal tar enamel.

DIVISION DHS 12

SPACE HEATERS - GAS

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS SPECIFICATION INCLUDES THE REQUIREMENTS FOR GAS-FIRED SPACE HEATERS AND MAY BE USED AS PART OF THE GENERAL CONTRACT SPECIFICATIONS OR IN A SEPARATE CONTRACT FOR THE DIRECT PURCHASE OF THE HEATERS.

THE SPACE HEATER CAPACITIES HAVE BEEN FIGURED ON THE BASIS OF A -10°F. DESIGN TEMPERATURE (NO STORM SASH OR DOORS) WITH ADEQUATE ALLOWANCES FOR PICK-UP. BY THIS METHOD, THE RELOCATION OF THE DWELLING UNIT FROM WARMER TO COLDER ZONES IS PRACTICABLE WITHOUT CHANGING THE HEATER TO A LARGER SIZE.

CHIMNEYS ARE OF SUSPENDED TYPE AND ARE SPECIFIED UNDER ANOTHER DIVISION.

THIS SPECIFICATION MUST BE ADAPTED TO SITE AND CLIMATE CONDITIONS. CHANGE THE TEXT AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 12

SPACE HEATERS - GAS

1. SCOPE

Include gas-fired space heaters and related items for family dwellings and for any service buildings included in the contract. See the drawings and General Scope of Work for extent of work.

2. DETAILED REQUIREMENTS

Space heaters in complete assembly shall have the current listing of the American Gas Association and shall bear its label. Rating shall be on the basis of input and shall be not less than the amount indicated on the drawings. Heaters shall be circulating, vented, cabinet style equipped with burner adaptable and fitted to burn type of gas available. The outside casing shall have a baked enameled finish. Connection to gas piping is provided for under the Division, "PLUMBING".

a. A manually operated gas valve shall be provided for main burner and an automatic pilot fitted with means for manual shut off. On heaters for use with natural and manufactured gases, pilot shall shut gas supply to main burner upon flame failure; on heaters for use with liquefied petroleum, propane-air or butane-air gases, pilot shall shut gas supply to main burner and pilot burner upon flame failure.

b. Smoke pipe shall be constructed of black steel, not less than No. 24 gauge (thickness 0.0239 inches); size shall be as indicated, or if not indicated, shall be same as outlet on the heater. Joints shall be gas tight. Allow for expansion. Extend and connect smoke pipe to suspended chimney. Where smoke pipe passes through combustible construction a metal ventilated thimble, not less than four inches larger than the smoke pipe, and constructed of No. 26 gauge steel, shall be installed around the pipe.

(1) Insulate smoke pipe when in proximity to range, from point directly over draft hood to point 18 inches above top of range. Insulation shall be of laminated asbestos structure capable of withstanding sustained temperature up to 1000 degrees F. without disintegration and be furnished in the form of sleeves. Sleeves shall have wall thickness of not less than one inch and have a minimum of 16 plies per inch. Material, including surfacing, shall contain not over 3% of combustible material by weight evenly distributed; proportion of combustible material shall be based upon carbon content assuming that cellulose will be 2-1/4 times the carbon content as determined in combustion furnace. Secure insulation neatly around pipe.

c. Fire and test each heater. Make all adjustments in accordance with manufacturer's or local utility company's instructions. Fuel for tests will be furnished by the Government. Operating instructions shall be permanently affixed near heater in each dwelling unit.

DIVISION DHS 12a

SPACE HEATERS - OIL

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THE SPECIFICATIONS INCLUDE THE REQUIREMENTS FOR OIL FIRED SPACE HEATERS AND MAY BE USED AS PART OF THE GENERAL CONTRACT SPECIFICATIONS, OR IN A SEPARATE CONTRACT FOR THE DIRECT PURCHASE OF THE HEATERS.

THE SPACE HEATER CAPACITIES HAVE BEEN FIGURED ON THE BASIS OF A -10°F. DESIGN TEMPERATURE (NO STORM SASH OR DOORS) WITH ADEQUATE ALLOWANCES FOR PICK-UP. BY THIS METHOD, THE RELOCATION OF THE DWELLING FROM WARMER TO COLDER ZONES IS PRACTICABLE WITHOUT CHANGING THE HEATER TO A LARGER SIZE.

CHIMNEYS ARE OF SUSPENDED TYPE AND ARE SPECIFIED UNDER ANOTHER DIVISION.

THIS SPECIFICATION MUST BE ADAPTED TO SITE AND CLIMATE CONDITIONS. CHANGE THE TEXT AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 12a

SPACE HEATERS - OIL

1. SCOPE

Include oil-fired space heaters and related items for dwellings and for any service buildings included in the contract. See drawings and "General Scope of Work" for extent of work.

2. DETAILED REQUIREMENTS

Space heaters in complete assembly shall comply with Commercial Standard CS 101-43, "Flue-Connected Oil-Burning Space Heaters Equipped with Vaporizing Pot-Type Burners," issued through the Commodity Standards Division, Office of Industry and Commerce, Department of Commerce, Washington 25, D. C., and shall be so labeled. Output capacity shall be not less than the amount indicated on the drawings. Heater shall be circulating type, flue-connected. The casing may be supplemented with provisions for radiant heat, such as a door or doors rigidly constructed and accurately fitted in casing or with adjustable louvres; casing shall have a baked enamel finish and be without extensive perforations between bottom and top level of combustion chamber. Servicing of burner shall be through front or sides of heater without removing casing or any part thereof.

* a. Even supply of fuel to burner shall be maintained by an Underwriters Laboratories' approved constant level valve, which shall regulate the flow of oil. The valve shall include means to prevent further supply of oil to burner when the oil reaches a predetermined level therein, and have a manual reset.

b. Heaters shall be equipped with fuel tank, in integral assembly, having a minimum storage capacity of four gallons. Between the tank and the constant level valve, provide a cleanout plug or sludge trap. Include integral means to ensure a level burner.

c. Oil storage drum shall be ICC standard of not less than 18 gauge steel, nominal capacity 55 gallons. Fit drum with threaded oil-fill and supply connections and with standard vent cap. Mount drum horizontally on carriage herein specified so that supply connection from drum is not less than 6 inches nor more than 12 inches above oil level in constant level valve at heater and side of drum is within 8 inches to 12 inches from outside wall.

(1) Carriage for oil drum shall consist of two 2-inch x 4-inch X frames with two 1-inch x 4-inch crossbraces and two 1-inch x 6-inch longitudinal braces, all No. 2 yellow pine or fir or equivalent and all securely nailed together and set on two concrete pads two inches thick. A metal carriage

NOTE: These pages 12a-1 and 12a-2 supersede pages 12a-1 and 12a-2 of Division DHS 12a dated 2-1-52. Material * between asterisks* is new or revised.

capable of supporting three times the weight of the oil drum and contents may be used in lieu of the wood support described above. The height of the carriage shall be such as to permit installation of the oil piping as specified herein.

(2) Piping shall be black, standard weight, steel or wrought iron, 3/8 inch IPS with malleable iron fittings or steel tubing not less than 1/4 inch ID with flared joints; allow for flexibility. Make connections to oil heater and drum, ready for operation. Provide a three-way valve at constant level valve and install so that oil may be supplied either from outside storage drum or tank on heater and arrange so that oil cannot flow into tank on heater when it is being drawn from drum. Run piping in dwelling units through the floor near the heater, extend under floor, properly supported, to outside then to oil drum. Run piping in laundry above the floor. (See drawings.) Fit piping at drum with gate or globe valve, Underwriters Laboratories approved oil filter and dirt leg at bottom of vertical drop. Fit metal escutcheon around pipe where it passes through the floor.

(3) Locate oil drum for dwelling units in rear between living room and bathroom windows.

(4) Prime wood tank carriage with one coat exterior oil paint. Prime black pipe, tank and metal tank carriage with red lead paint TT-P-86a and apply a finish coat of aluminum paint to piping, tank and tank supports. *

d. Set heater on a non-combustible stove board of sufficient size to extend a minimum of six inches on all sides of completely assembled heater. Board shall be not less than 3/8 inches thick. Board shall be considered non-combustible when it contains not over 3% of combustible material by weight, evenly distributed.

e. Smoke pipe shall be constructed of black steel not less than No. 24 gauge (thickness 0.0239 inches). Size shall be as indicated, or if not indicated, shall be same as outlet of the heater. Joints shall be gas tight; allow for expansion. Connect draft regulater in accordance with manufacturer's instructions.

Extend and connect smoke pipe to suspended chimney. Where smoke pipe passes through combustible construction, a metal ventilated thimble, not less than four inches larger than the smoke pipe and constructed of No. 26 gauge steel, shall be installed around the pipe.

f. Fire and test three heaters of each size, selected by Government. Test shall be in accordance with manufacturer's instructions. Furnish fuel oil (No. 1), as defined in Commercial Standards CS 12-48, "Fuel Oils," required for the test. Make adjustments on all other heaters as a result of these tests. Operating instructions shall be permanently affixed near heater in each dwelling unit.

DIVISION DHS 12b

HEATING-FORCED WARM AIR

NOTES TO THE ARCHITECT OR ENGINEER:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

USE THIS SPECIFICATION ONLY WHERE DUCT LAYOUT IS SHOWN ON STANDARD DRAWING. SHOW DUCT SIZES, FURNACE AND BLOWER MOTOR SIZE AND RESISTANCE PRESSURE IN INCHES OF WATER COLUMN.

THE SPECIFICATIONS INCLUDES ITEMS ON GAS AND OIL FIRED FURNACES. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FOR EXAMPLE, IF GAS FIRED FURNACES ARE REQUIRED, DELETE ENTIRE SECTION 5 AND PARAGRAPH b OF SECTION 7, WHICH APPLY TO OIL FIRED FURNACES. CHANGE THE TEXT AS NECESSARY TO MEET PROJECT REQUIREMENTS AND FILL IN BLANK SPACES.

DIVISION DHS 12b

HEATING-FORCED WARM AIR

1. SCOPE

Include forced warm air system for_____building included in the contract. See the drawings and "General Scope of Work" for extent of work.

a. System shall be of the blow-through type. Air shall be heated by a furnace, _____fired.

2. MATERIALS

a. Ducts unless otherwise noted, shall be constructed of galvanized sheet steel not lighter than No. 26 U. S. Standard gage. Dampers shall be constructed of the same material as the duct and shall be not less than two gages heavier than the ducts.

b. Flexible connection shall be standard thickness asbestos canvas.

c. Hangers for supporting ducts to building construction shall be of the same material as the ducts.

d. Supply registers shall be of the sizes indicated on the drawings of steel not lighter than No. 18 U. S. Standard gage, and with rubber gasket. Registers shall have means for adjustment of air flow both vertically and in the left and right directions. Registers shall be painted with a prime coat at the factory.

e. Return grilles shall be steel not lighter than No. 16 U. S. Standard gage, with rubber gasket, painted with a prime coat at the factory.

f. Smoke pipe shall be constructed of not less than No. 24 U. S. Standard gage (.0239 inches) black steel.

3. FURNACE

a. General

(1) Furnace and blower-motor unit shall be enclosed within one casing or be separately enclosed. Casings shall be baked enamel steel not lighter than No. 22 U. S. Standard gage. Casing shall have smooth or wrinkle finish and shall be rigidly secured from the inside. The portion of the casing enclosing the furnace shall be equipped with a galvanized or black steel liner not lighter than No. 26 U. S. Standard gage. The liner shall be secured to the casing to provide not less than one inch clearance between casing and liner permitting positive air flow therein. In lieu of an inner liner, insulating material may be provided.

(2) The blower-motor unit shall be mounted on a single base set on sound-absorbing media. The blower shall be a standard catalog product of a reputable manufacturer, and shall deliver the cubic feet of air per minute against the external pressure indicated on the drawings. The blower shall be constructed and rated in accordance with the standards of the National Association of Fan Manufacturers and the Standard Test Code for Centrifugal and Axial Fans of the American Society of Heating and Ventilating Engineers.

(3) Fan motors shall be of a type suitable for this use, and be free from objectionable radio interference. Motors shall be constant speed with adjustable pulley, connected to blower with "V" belt drive. Motor shall be in accordance with AIEE and NEMA Standards. Provide thermal overload protection of the automatic reset type.

(4) Filters shall be of the replaceable type, arranged and located for any removal through access door in the casing. Average velocity through the filter shall not exceed 300 fpm based on the nominal, external dimensions of the filter.

(5) Air temperature controls shall consist of a high limit control, blower control and room thermostat. Controls shall have the current listing of the Underwriters' Laboratories, Inc. Wiring connections and material shall be furnished and installed under the Division "Interior Electrical Wiring".

(a) An immersion type bonnet thermostat shall operate the blower "on and off" over a scale range of approximately 90 to 180°F, with an adjustable differential of approximately 25°F. The bonnet thermostat shall have an adjustable high limit control which shall not permit the delivery of air heated above 250°F. The high limit control may be furnished as an integral part of the bonnet thermostat, or as a separate unit.

(b) The room thermostat shall operate the firing equipment on and off when the room temperature is below or above the predetermined setting. Thermostat shall be equipped with a thermometer, having a scale range of 55 to 85°F and shall operate on a differential of 2°F.

4. GAS FIRED FURNACE

Furnaces shall conform to the latest approved requirements for "Central Gas Appliances" as sponsored by the American Gas Association and approved by the American Standards Association, and shall bear the AGA label. Burner shall be adaptable to the type of gas available. Gas controls including shut-off cock for main burner and pilot burner shall be installed complete at the factory.

a. Gas piping and gas connection to furnace will be provided for under the Division "Plumbing".

5. OIL FIRED FURNACE

Furnace shall be constructed of heavy steel plate, and be the standard catalogue product of a reputable manufacturer. Flue gas temperature and CO2 as measured in smoke pipe not over 12 inches from furnace and on the furnace side of draft regulator, shall not exceed 700°F with a CO2 of 8 per cent. Bonnet air temperature shall not exceed 160°F with air inlet temperature approximately 60°F. Readings shall be taken at full load capacity of the furnace and only after steady conditions have been sustained for a one hour period.

a. Combustion chamber shall be constructed of intermediate heat duty fire brick laid in fire clay batter suitable to the brick, or shall be a prefabricated type of refractory of equivalent heat resistant quality as the fire brick.

b. Oil burner unit shall be mechanical draft, direct-connected electric motor driven, self-contained, equipped with electric ignition and safety devices; be adaptable for burning No. 2 oil as defined in Commercial Standard CS 12-48 "Fuel Oils" issued by the National Bureau of Standards. Burner and auxiliary devices shall have, as a completely integral unit, the current listing of the Underwriters' Laboratories Inc. and bear their label. Protect oil delivered to burner with an Underwriters' approved filter. Safety control device shall stop burner upon flame failure; restart shall be manual. Burner output capacity shall be 125 per cent of the furnace output capacity.

c. Oil storage tank shall be a nominal capacity of 275 gallons. Tank and complete oil burning installation shall conform to the "Standards of the National Board of Oil Burning Equipments" (NBFU Pamphlet 31). Equip tank with oil gauge of float type, and set tank one foot from wall.

d. Oil, vent and fill piping shall be standard weight steel or wrought iron; fittings shall be 125 pound malleable iron. Vent hood shall be black or galvanized. Provide shut-off valve at burner.

e. Fire extinguisher shall be Underwriters' Laboratories' approved carbon-tetrachloride type 1-1/2 quart minimum capacity. Mount extinguisher in furnace room, supported from wall by bracket.

f. Draft regulator shall be installed in smoke pipe and shall operate to maintain any predetermined draft without regard to weather conditions. Counterbalancing shall be adjustable.

g. Paint tank and piping with a heavy brush coat of coal tar enamel.

6. INSTALLATION

a. Install and connect the complete heating system ready for operation to give proper and continuous service.

b. Erect ducts to insure minimum of friction with all joints air tight. Install dampers where shown or necessary to balance system properly. Ducts shall be sized as indicated on the drawings, firmly fastened to adjacent construction and installed in accordance with Pamphlet No. 90, issued by the National Board of Fire Underwriters.

c. Install flexible connections between the furnace and ducts.

d. All electrical controls, relays, etc. shall be furnished as part of this division of the specifications. All wiring is included in the Division INTERIOR ELECTRICAL WIRING.

e. Erect smoke pipe with all joints accurately fitted, smoke tight and with all required draft controls.

7. TESTS AND ADJUSTMENTS

a. Fire, test and adjust gas-fired furnaces in accordance with manufacturer's or local utility company's instructions. Fuel and electric energy for test will be supplied by Government.

b. Fire, test and adjust oil-fired furnaces to meet the requirements specified herein. Make tests with No. 2 fuel oil as defined in Commercial Standard CS 12-48, "Fuel Oil" issued by the National Bureau of Standards. Furnish fuel for tests. Electric energy will be furnished by Government.

c. After completion of each heating system place each blower in operation and make required adjustments to provide quiet performance. Adjust all balancing dampers so that the amount of air delivered to each room complies with the requirements as noted on the plans.

d. Instruct project personnel in the care and maintenance of the equipment and permanently affix in a glazed frame, adjacent to heater and where directed by the Contracting Officer, instructions for the operation of the furnace.

DIVISION DHS 13

INTERIOR ELECTRIC WIRING

NOTES TO THE ARCHITECT OR ENGINEER:

THESE NOTES ARE FOR THE INFORMATION OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

MATERIALS OR METHODS LISTED HEREIN ARE SUITABLE FOR ANY TEMPORARY BUILDING, EXCEPT LIGHTING FIXTURES AND SIZE OF LAMP BULBS FOR LAUNDRY AND OTHER PROJECT BUILDINGS. DRAWINGS INDICATE TYPE OF LIGHTING FIXTURES AND LAMP BULB SIZES FOR LAUNDRY BUILDING. FOR OTHER PROJECT BUILDING THE TYPE OF FIXTURE AND LAMP BULB SIZE SHALL ADEQUATELY SERVE AREA NOTED: OFFICE SPACE - CEILING CANOPY AND FITTER WITH ENCLOSED GLASS GLOBE - 150-200 WATT, MAINTENANCE SPACE - CEILING OR SUSPENDED TYPE WITH METAL REFLECTOR - 100-150 WATT, OTHER SPACES - CEILING BEAM TYPE - 60 WATT.

DRAWINGS INDICATE DETAILS NOT INCLUDED IN THE SPECIFICATION, SUCH AS MINIMUM SIZE OF CONDUCTORS AND NUMBER OF CIRCUITS REQUIRED PER DWELLING UNIT, TYPICAL CIRCUITING DIAGRAM, AND MINIMUM SIZE OF SERVICE ENTRANCE CONDUCTORS.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS, CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

PARAGRAPHS MARKED THUS ( ) COVER VARYING TYPES OF MATERIALS AND INSTALLATION METHODS WHICH WILL BE REQUIRED FOR CONNECTING (a) ELECTRIC REFRIGERATOR, (b) ELECTRIC RANGE, (c) ELECTRIC WATER HEATERS, (d) MOTORIZED EQUIPMENT, AND (e) WHOLESALE PURCHASE OF ELECTRIC SERVICE, WHEN SPECIFIED AS A PART OF THE PROJECT REQUIREMENTS. SELECT THE TYPE OR TYPES SUITED TO THE PROJECT AND OMIT THOSE NOT SUITABLE.

DIVISION DHS 13

INTERIOR ELECTRIC WIRING

1. SCOPE

Include interior electrical wiring, fixture installations and items included in this Division required to complete the project. See the drawings and General Scope of Work for extent of work.

a. The work under this Division shall commence at the point of attachment of the overhead service drop.

(1) From point of service pickup at each building, extend service entrance conductors to dwelling unit metering equipment, using service entrance cable.

(2) For all wiring inside of building:

(a) Use non-metallic sheathed cable for Series 1 dwellings and laundry buildings.

(b) Use knob and tube wiring, non-metallic sheathed cable or armored cable for project buildings.

b. Light and Power System. Electrical service supplied to each building will be_____volts_____phase_____cycle_____wire. Service to each dwelling unit shall be_____volts,_____phase,_____ cycle,_____wire.

2. CODES

The contractor shall base his bid upon the plans and specifications, but such installation shall comply with the latest applicable rules and regulations of the National Electrical Code bearing on the installation of the work. The contractor's attention is directed to article, PERMITS AND CODES, of the General Conditions.

3. GENERAL REQUIREMENTS

a. Electrical system layouts indicated on drawings are generally diagrammatic and locations of outlets and equipment are approximate; exact routing of cables, locations of outlets and equipment shall be governed by structural conditions and obstructions. This is not to be construed to permit redesigning systems; all outlets should be interconnected as shown on drawings. Locate and install equipment requiring maintenance and operation so it will be readily accessible.

b. The right is reserved to make any reasonable change in location of outlets and equipment prior to roughing-in, without involving additional expense.

4. MATERIALS AND APPLIANCES

Materials and appliances of the types for which there are Underwriters' Laboratories standard requirements, listings and labels, shall have listing of Underwriters' Laboratories and be so labeled, or shall conform to their requirements, in which case certified statements to the effect shall be furnished, if requested. Use new materials and appliances.

Materials other than those listed herein shall be the size, type and capacity indicated by the drawings and the specifications. In so far as possible, use one type and quality. Materials and appliances shall conform to the Standard listed with each item in the following paragraphs:

a. Boxes and Covers

(1) Metal or non-metallic - Underwriters' Laboratories approved.

b. Wires and Cables. Conductors (building) shall be soft-annealed tinned copper or medium hard drawn aluminum. Conductors (fixtures) shall be flexible stranded wires having approved heat resisting insulation. Wires and cables as listed below shall be Underwriters' Laboratories approved.

(1) Heat resistant fixture wire

(2) Code grade types R and RL

(3) Moisture resistant type RW

(4) Heat resistant type RH

(5) Armored bushed type cable (type R insulation)

(6) Non-metallic sheathed cable (type R insulation)

(7) Thermoplastic - types T and TW

(8) Service entrance cable, type SE

(9) All rubber cord, heavy duty type S (range connection)

c. Wiring devices shall conform to Federal Specifications WW-P-15la, Type II, Style 102, WS-893, and/or WS-896, respectively. Plaster ears are optional.

(1) Single or duplex receptacles (flush or surface) shall be 15 ampere, 125 volt.

(2) Tumbler switches (flush or surface) shall be "T" rated - not less than 10 ampere, 125 volt.

(3) Combination of devices shall be single gang mounting wherever practicable.

(4) Polarized receptacles shall be 2 wire, 3 pole, 15 ampere, 125 volt.

d. Plates and finishes for switches, receptacles and other outlets (in connection with concealed wiring), requiring plates, shall be non-metallic.

e. Service and motor disconnects shall be fused safety switch (Type C), fused safety switch ("pull out" type), or circuit breakers.

Service equipment shall comply with regulations of the local utility company. Universal meter socket receptacle, if furnished, shall be provided with cover plate and sealing ring; meter pans or encasing cabinets shall be provided with covers and seals. METERS SHALL NOT BE FURNISHED UNDER THIS CONTRACT.

f. Branch circuit panels shall consist of the required number of protective devices and required disconnects. Where panels are located outside of area served, provide a typewritten circuit directory protected by a durable transparent covering, mounted in a suitable frame on panel door.

g. Cabinets shall consist of sheet steel, code gauge, for surface or flush mounting as indicated.

(1) Interior flush mounted cabinets shall be unpainted galvanized steel, bonderized or otherwise treated to resist corrosion, and painted a prime shop coat. Surface mounted cabinets, covers, trims, and doors shall be bonderized or otherwise treated to resist corrosion, painted a prime shop coat, and finished with one coat of baked enamel, standard finish.

(2) Exterior cabinets shall be of weather proof construction. Exposed cabinets, covers, trims and doors shall be bonderized or otherwise treated to resist corrosion. Apply prime shop coat and finish with one coat of baked enamel, standard finish. Provide pin tumbler lock or padlock for "protective section," arranged for masterkeying. (Provide 6 master keys.)

h. Protective equipment shall be fused or circuit breaker type at the option of the contractor. Whichever is elected shall be used consistently throughout the entire installation.

(1) Circuit breaker panel - Underwriters' Laboratories approved.

(2) Fuse panels - dead front type, with interchangeable, non-combustible, insulated base fuse section - Underwriters' Laboratories approved.

i. Fuses

(1) Cartridge, renewable (0 to 100A) - Underwriters' Laboratories approved.

(2) Cartridge, non-renewable (over 100A) - Underwriters' Laboratories approved.

(3) Plug fuse (type "S", non-tamperable with adapters for screw base) - Underwriters' Laboratories approved.

j. Tapes (electrical) - Underwriters' Laboratories approved.

k. Dwelling Unit Lighting Fixtures and Lamp Bulbs

(1) Lighting fixtures for exposed surface wiring shall be of the standard lamp holder surface type device - Federal Specification W-L-142, Type VI, Style 5 & 6, which shall permit ready interchange and replacement. Finish shall be standard.

(a) Pull control fixtures shall have a snubber or stop at the hole where the chain emerges, to relieve the strain of excessive pull on the switch mechanism. Provide 30 inch extension cord for each pull control fixture.

(2) Lighting fixtures for concealed wiring shall be simple and sturdy in design, nonmetallic of standard types which will permit ready interchange and replacement.

(a) Ceiling fixture shall be beam type, with flared ring opening, and provided with a canopy type toggle switch with short chain and 30 inch extension cord, pull chain sockets not permitted.

(b) Two piece type receptacles which are dependent entirely upon the screw ring to prevent the body of the receptacle from rotating in the holder, will not be permitted.

(c) Bracket fixtures shall include a toggle type switch and a single receptacle.

(3) Before purchase, submit sample fixtures to the contracting officer for approval.

(4) Lamp bulbs - Federal Specification W-L-101e.

5. INSTALLATION OF OUTLET BOXES, COVER, DEVICES AND PLATES

a. Boxes shall be of sizes and types to accommodate (1) structural conditions, (2) size and number of conductors or cables entering, and (3) device or fixture for which required. Boxes for exterior fixture outlets shall be provided with a gasket.

b. Mount outlets flush. Provide plaster rings or covers on boxes where required.

c. Support fixtures at boxes as determined by the type of fixture, that is, whether studs or straps are required, furnish necessary fixture supports.

d. Center outlets in paneling or in other architectural features; clear trims and corners by four inches. Locate switch outlets adjacent to door openings on strike side of doors, except where shown otherwise. Brackets and switch outlets shall clear doors by six inches.

e. Height of outlets from center to finish floor, unless otherwise noted, shall be as follows:

	Series 1 Dwellings	Laundry and Project Buildings
Switches (public space)	----	5 feet
Switches (general)	----	4 feet
Combination switch and receptacle	----	4 feet
Insertion receptacle	4 feet, 6 inches	1 foot or 4 feet, 6 inches (whichever results in the least amount of material)
Bracket fixture	6 feet, 6 inches	5 feet, 6 inches
Refrigerator receptacle approx.	3 feet	--------
Range outlet	6 inches below top and on center line	--------
Transfer switch	4 feet, 6 inches	--------

Locate refrigerator receptacle 1 foot, 8 inches from center line of refrigerator to the side which will permit serving work space and table appliances. The kitchen equipment layout governs exact height; check kitchen details before installation.

Locate bathroom fixture on wall, centered above the medicine cabinet and/or mirror.

f. If wiring devices without plaster ears are used, care should be exercised in pulling "wiring devices" up for alignment on plates.

6. INSTALLATION OF WIRES AND CABLES

a. Conceal wiring from view. In non-fireproof floor and roof construction run parallel to and between joists wherever practical. Cutting of vertical studs not permitted in outside walls. Interior partition studs may be drilled, cut or notched where absolutely necessary and then only to a minimum.

b. Keep raceways clear of partitions at ends of bathtub permitting future cutting of partitions to remove tub without disturbing electrical system.

c. Where conductors of "knob and tube" system are installed in the hollow spaces of walls and ceilings in which thermal insulation is used, each conductor shall be separately encased in a continuous length of flexible tubing extending from one support to the next or to an outlet box. When practicable conductors shall be run single on separate framing members, conductors not encased in flexible tubing shall be kept at least one inch away from thermal insulation material.

d. Where it is impractical to conceal portions of wiring due to structural conditions, wiring may be exposed. All wiring in Series 1 dwellings shall be installed exposed on the surface of walls and ceiling. In such cases, the wiring systems and devices shall be of a type designed for exposed work-conductors to be two or three conductor non-metallic sheathed cable; switch and outlet devices of non-metallic material of type not requiring outlet boxes.

(1) Securely fasten cables in place by means of straps spaced not more than two feet apart, attached to structure by screws. In passing through floors, protect cables against mechanical injury.

(2) Securely fasten devices to structure; make splices and taps within wiring devices or terminal block; do not damage or remove cable sheath outside of wiring devices.

(3) Where practical, connect single cable runs to devices. To accomplish this, provide junction boxes in attic or closet space.

(4) Cover all exposed non-metallic sheathed cable runs in rooms with suitable wood moulding securely fastened in place.

e. Use lead covering over rubber insulation in underground locations, in moist locations use lead or moisture resisting rubber covering.

f. Eliminate splices wherever possible; where necessary, splice in readily accessible pull, junction or outlet box.

g. Make taps and splices in wire #8 and smaller mechanically tight by using "Western Union" or pigtail splice, properly cleaned, soldered for copper wire and aluminum welded or mechanically bonded for aluminum wire, and insulated with rubber and friction tapes, flashover or insulation value of joints being at least 100 per cent in excess of wire insulation. Mechanical wire splicers and joints, except those using set screws bearing directly on conductor, may be used.

h. Make taps and splices in wire #6 and larger by means of brass or copper pressure connectors applied after wire has been cleaned; make tight and fully insulate as specified in preceding paragraph. Use parallel taps where necessary to conserve working space.

7. WIRING CONNECTIONS (GENERAL)

a. Provide required number of branch circuits, with one circuit for receptacle outlets in kitchens and dining space and additional circuits for remainder of general lighting and receptacle outlets.

b. Where terminals permit, connections for wire #8 and larger to switches, panelboards, etc., shall be with soldered copper lugs or terminals of style to fit terminal and size to handle full wire capacity; mechanical lugs, except that those using set screws bearing directly on conductors, may be used.

c. Balance load as nearly as possible where three wire panels are provided.

8. SERVICE CONNECTIONS

a. The elctrical system covered by this division shall commence at the "overhead" point of service contact on exterior of building. From this point of contact extend wiring to service equipment and panels thence to outlets. At service contact leave slack cable or conductors for connecting to service loop; provide and install adequate anchorage at building to receive service loop. Connection to service drop to be made by contractor for the overhead distribution.

b. Generally, locate branch circuit protective devices on the interior of dwelling units at, or near, the point of service entrance. From this cabinet, extend circuit home runs to nearest outlets served by the respective circuits. Provide suitable cover fitting where service conductor enters dwelling unit, and suitable service head fitting at point of service contact.

9. INSTALLATION OF LIGHTING FIXTURES AND LAMP BULBS

a. Install a lighting fixture on each fixture outlet of the type specified under "Materials."

b. Provide lamp bulbs for all fixtures or lamp holder wiring devices. Install lamp bulbs in all fixtures, except those in dwelling units. Bulbs for use within dwelling units shall be delivered in original cartons to Government's representative.

(1) Size of lamp bulbs for dwelling units shall be:

Living room and kitchen	75 watts
Bedrooms	60 watts
Bathrooms	40 watts
Halls, closets, etc.	25 watts

10. FUSES AND CIRCUIT BREAKERS

a. Select overcurrent protective devices (fuse or circuit breakers) for branch lighting and appliance circuits rated (or set) at not more than 15 amperes, except that the overcurrent devices for water heater circuit shall not be more than 20 ampere rating.

b. If contractor elects to use circuit breakers, such equipment shall also be used in feeder protection; likewise, with respect to fuses. Protective devices in a circuit shall be so coordinated as to cause the protective device nearest the load to open first in case of overload, short circuit or ground.

c. At completion, after all testing has been done, install one complete set of fuses for all switches and panels requiring same. In addition, furnish 15 per cent of one complete duplicate set of each size in original cartons.

11. GROUNDING

a. Where knob and tube wiring and/or non-metallic sheathed cable is used in conjunction with armored cable, the ground requirements are of special importance.

b. Where metal boxes are used in connection with non-metallic sheathed cable, each such box and the non-current carrying parts of other fixed equipment shall be grounded in accordance with Art. 2557(a) of the National Electrical Code, 1951 Edition.

c. Ground each service entrance to cold water piping in a manner prescribed by the National Electrical Code. Ground clamps shall be approved type and installed accessible. Provide such other system and/or equipment grounds as may be required by the National Electrical Code.

12. FINAL INSPECTION AND TESTS

Prior to test, feeders and branch circuits shall be continuous from service contact point to each outlet; all panels, feeders and devices connected and fuses in place. Test system free from short circuits and grounds with insulation resistances, not less than outlined in Section 1119, 1951 National Electrical Code. Provide testing equipment necessary and conduct test in presence of the Government's authorized representative. Submit three (3) certified copies of test reports to the project engineer for record.

(_) ELECTRICAL CONNECTIONS (EQUIPMENT)

a. Overcurrent protection and disconnecting means as required by the NEC shall be provided for motors. Motor driven equipment specified under PLUMBING and HEATING divisions may be factory wired complete with controllers and motor disconnects, therefore, this contractor should check equipment purchased under those divisions so as to avoid duplication of protective and disconnecting means.

b. Motor and control apparatus specified under other divisions unless specifically mentioned as being connected under such divisions shall be connected ready for operation under this division.

(_) WIRING CONNECTIONS TO ELECTRIC REFRIGERATOR

Electric refrigerators will be furnished, uncrated, delivered in kitchens by others. This contractor shall insert the cord connection in receptacle provided at each refrigerator location.

(_) WIRING CONNECTIONS TO ELECTRIC WATER HEATER

a. Electric water heaters specified under the PLUMBING division shall be electrically connected ready for operation under this division.

b. The electric water heater circuit shall be connected to one load side of the double-throw manually operated disconnect switch located on the wall near the electric cooking equipment, when electric energy is supplied for cooking and water heating. The other load side of the switch is to be connected to the electric cooking equipment; the line side of the switch to be connected to the Dwelling Unit Panel. During operation of the electric cooking equipment no current will flow to the electric water heater; during operation of the electric water heater, the electric cooking equipment will be inoperative.

c. When another fuel is supplied for cooking, the electric heater circuit shall be connected directly to Dwelling Unit Panel.

d. Provide overcurrent protection at the electric water heater (when connected to double throw switch) based on size of the electric elements in the water heater and principle of operation.

e. Locate heater outlet on wall, back of heater. Connection between wall outlet and heater shall consist of armored cable, or wire and flexible steel conduit.

f. Ground heater frame to main ground as prescribed by National Electric Code.

(_) WIRING CONNECTIONS TO ELECTRIC RANGE

a. Electric ranges will be furnished, uncrated, delivered in kitchen by others. This contractor shall furnish and install cable connection as specified hereinafter.

b. Furnish and install on wall near range, a suitable 60 amp. double-throw transfer switch, so that when the range is in use the water heater will not be in service, and/or when the water heater is in use the range will not be in service. Switch shall have legible indication on outside of cover, "Heater-Off-Range."

c. Range circuit shall consist of 3 or 4 conductor all rubber cord from range to outlet box (back of range) and splice to one load side of transfer (double-throw) switch. Provide cable support or grip on all rubber cord to avoid mechanical strain on splice in outlet box and on terminals on range.

d. Ground range frame to main ground as prescribed by National Electrical Code.

e. Provide slack in connecting cable permitting range being moved three (3) feet from wall without disconnecting. Provide conductors with lugs (if necessary) to accommodate range terminal block.

DIVISION DHS 14

SITE IMPROVEMENTS (ROADS, WALKS, ETC.)

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

SECTION 1. SCOPE. THE DRAWINGS SHOULD SHOW CLEARLY THE EXTENT OF OFF-SITE WORK. IF SITE BOUNDARIES ARE SHOWN, A NOTE SHOULD STATE THAT THEY ARE FOR THE PURPOSE OF IDENTIFICATION AND NOT ALL CONTRACT WORK IS NECESSARILY CONFINED WITHIN THEM.

SECTION 3. CONCRETE WORK. IN CASE THE PROJECT SPECIFICATIONS WILL NOT CONTAIN A DIVISION, "CONCRETE AND MASONRY", INSERT HERE AN ADEQUATE SPECIFICATION FOR THE CONCRETE WORK INVOLVED IN THE SITE IMPROVEMENTS PLANNED.

WALKS. DRAWINGS SHOULD SHOW TYPE OR TYPES OF WALK TO BE CONSTRUCTED IN ALL LOCATIONS. CHOICE OF TYPE AND SPECIFICATION REQUIREMENTS ARE GOVERNED BY LOCAL CONDITIONS. (SEE NOTES RE: ROADWAY AND PARKING AREA SURFACING.)

SECTION 6. CONCRETE BLOCK WALKS. DRAWINGS SHOULD SHOW DETAILS OF BLOCKS AND LAYING.

SECTION 7. AGGREGATE WALKS. IN CASE THERE IS NO SUITABLE STATE SPECIFICATION FOR AGGREGATE FOR WALKS, THE FOLLOWING MAY BE USED:

Fraction passing 3/4 inch square sieve	100%
Fraction passing No. 4 square sieve	75% Maximum
Fraction passing No. 200 square sieve	5 to 15 % (Not over 50% of fraction passing No. 40)
Loam or clay content	15 % Minimum
For fraction passing No. 40 sieve:	
Liquid limit	25
Plasticity index	4 to 9

HOWEVER, IT IS PREFERABLE TO USE A STATE SPECIFICATION, IF AVAILABLE. BITUMINOUS SURFACE TREATMENT SUCH AS COVERED BY TEXT IS DESIRABLE BUT NOT ALWAYS ESSENTIAL.

SECTION 9. CONCRETE CURB. IF CURB OR COMBINED CURB AND GUTTER IS REQUIRED IN CITY STREETS, SPECIFY CONSTRUCTION ACCORDING TO CITY STANDARDS. IT IS EXPECTED THAT CONCRETE CURBING WILL NOT OFTEN BE NECESSARY WITHIN TEMPORARY HOUSING PROJECTS AND BARELY WITHIN TRAILER PROJECTS.

SECTION 10. ROADWAY AND PARKING AREA SURFACING. NO SPECIFICATION IS GIVEN FOR THIS ITEM AS REQUIREMENTS IN EACH CASE MUST BE ADAPTED TO MATERIALS LOCALLY AVAILABLE AND LOCAL CONSTRUCTION PRACTICE. ALSO TO CLIMATIC CONDITIONS AND TO SITE CONDITIONS AS REGARDS SOIL, DRAINAGE AND TOPOGRAPHY. A LOW-COST SURFACING SUCH AS STABILIZED GRAVEL, STONE OR SLAG, CALCIUM-CHLORIDE TREATED, OR PREFERABLY WITH BITUMINOUS SURFACE TREATMENT, SHOULD MOST OFTEN BE APPROPRIATE. IF PRACTICABLE, STIPULATE CONSTRUCTION IN ACCORDANCE WITH SOME SUITABLE CITY OR STATE SPECIFICATION, BUT TAKING EXCEPTION TO REQUIREMENTS NOT APPLICABLE TO PROJECT WORK. CONSULTATION WITH LOCAL ROAD BUILDING AUTHORITIES AND CONTRACTORS IS ALWAYS ADVISABLE.

SECTION 11, SURFACING FOR SPECIAL AREAS. IT IS ANTICIPATED THAT AS A RULE NO SURFACING, OTHER THAN TURF, WILL BE REQUIRED FOR RECREATION AREAS, LAUNDRY DRYING YARDS OR OTHER SPECIAL AREAS. IF AND WHEN DEEMED NECESSARY, HOWEVER, A SURFACING SIMILAR TO THAT SPECIFIED FOR WALKS (BUT WITH HEAVIER BITUMINOUS TREATMENT IN THE CASE OF RECREATION AREAS) MAY BE SUITABLE. IN ANY EVENT THE SPECIFICATION MUST BE FITTED TO LOCAL CONDITIONS. (SEE PRECEDING NOTES RE: ROADWAY AND PARKING AREA SURFACING.)

SECTION 12, LOG POSTS AND/OR GUARD RAILS. SHOW DETAILS ON THE DRAWINGS.

SECTION 13, CLOTHESLINE SUPPORTS. SHOW DETAILS ON THE DRAWINGS. LINES SHOULD BE 6' 2" ABOVE FINISHED GRADE. PROVIDE 2" x 8" x 2' 0" CROSS PIECE ON "BEARING" SIDE OF POST, CENTERED 12" BELOW FINISHED GRADE. FOR TRAILER PROJECTS, PAINTING MAY BE OMITTED.

PARAGRAPHS MARKED THUS ( ) COVER VARYING TYPES OF INSTALLATION AND MUST BE DELETED WHEN NOT NEEDED.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

NOTE: This page 14-iii supersedes page 14-iii of Division DHS 14 dated 2-1-52. Material * between asterisks * is new or revised.

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DIVISION DHS 14

SITE IMPROVEMENTS (ROADS, WALKS, ETC.)

1. SCOPE

Include pacing, surfacing, curbs, walks, clothesline supports,_____ _____, and other site improvements required to complete the project, except work specified in other divisions. See the drawings and General Scope of Work for extent of work.

2. SUBGRADE FOR SITE IMPROVEMENTS

Provide a firm, uniformly compacted subgrade at the required levels. Loosen exceptionally hard spots and recompact. Remove spongy and otherwise unsuitable material and replace with stable material. Fill and tamp all traces of utility trenches. Adjust tops of utility structures to finished grade.

3. CONCRETE WORK

Except as otherwise shown or specified, concrete work for site improvements shall comply with all applicable provisions of the Division, CONCRETE AND MASONRY.

4. STREET SIDEWALKS

Construct sidewalks in city streets in accordance with the standard specifications or requirements therefor of the City of _____.

5. CONCRETE WALKS

Concrete walks, except street sidewalks and concrete block walks, shall be of one-course construction, three inches thick and with 1/4 inch per foot cross slope. Give the concrete surface a wood- or carpet-float finish and round all edges to a 1/4-inch radius. Provide 1/2-inch transverse expansion joints with premolded filler at intervals of 50 feet, at walk intersections, and at junctions with concrete steps. Between expansion joints cut grooves 1/8 to 1/4 inch wide and at least one inch deep in the walk surface at intervals of five feet or otherwise as shown on drawings. Permit no pedestrian traffic on concrete walks for three days after pouring.

6. CONCRETE BLOCK WALKS

Cast the concrete blocks in flat position and give the wearing surface a wood-float finish. Keep the blocks in forms and wetted until they can be handled without damage. Minor imperfections on edges will not be considered objectionable. Bed the blocks firmly on a one inch sand cushion with tops 1/2 inch above finished grade.

7. AGGREGATE WALKS

Aggregate walks shall consist of a 3-inch (compacted-thickness) course of gravel, crush stone or slag, meeting the _____ State Highway Department Specification No. _____ or No. _____. Spread the aggregate evenly in a trench of the required walk width, moisten thoroughly and compact to an even surface at finished grade by a power roller or mechanical tamping. To the moistened, compacted surface apply slow-breaking emulsified asphalt at a rate of at least 0.20 gal. per sq.yd. After the emulsion has broken, sweep over the surface enough stone dust, fine sand or other fine aggregate to fill surface voids and coat the bituminous application. Remove excess loose material before completion of the work.

8. CONCRETE STEPS

Extend footings for concrete steps to undisturbed subsoil; if deeper than required by the drawings, the Contract Price will be adjusted (see GENERAL CONDITIONS). Finish treads with a wood float. Fill surface voids in formed surfaces with 1:2 mortar, and rub down formed surfaces which will be exposed.

9. CONCRETE CURB

Construct concrete curb in sections 6 to 10 feet long by using 1/8-inch division plates. Provide 1/2-inch expansion joints with premolded filler at 50 foot intervals and at ends of all returns. Finish smoothly with a wood float, without plastering. Round all edges to a 1/4-inch radius except as otherwise shown. Concrete curb shall be constructed of 3000-lb. concrete.

10. ROADWAY AND PARKING AREA SURFACING

(See Notes to the Architect)

11. SURFACING FOR SPECIAL AREAS

(See Notes to the Architect)

12. LOG POSTS AND/OR GUARDRAILS

Posts and/or guardrails at parking areas shall be reasonably straight, sound, and free from injurious defects and shall have been cut from live trees between one and twelve months before use. They shall be 7 inches minimum diameter. Immediately before the logs are used in the work, all bark shall be peeled and all knots and projections trimmed smooth. Logs of only one species shall be used at any one parking area.

13. CLOTHESLINE SUPPORTS

Clothesline posts and crossarms shall be No. 1 timbers, sized 4 sides, of cedar, cypress, fir or redwood; posts to be cut from nominal 6-inch stock. At the contractor's option, however, posts may be 6-inch butt, live cedar, cypress, redwood, fir or locust poles, sound and free from shakes, loose or hollow knots, and season checks more than 1/4 inch wide. Such poles shall be peeled for their entire length, removing all outer and inner bark by shaving the surface. Bottom of posts shall be sawed square and top rounded to conical shape. Paint above-ground work as specified in the division, PAINTING AND GLAZING.

14. WOOD FENCES, SCREENS AND HANDRAILS

Wood fences, screens and handrails shall be No. 1 cedar, cypress, redwood, southern pine, Douglas fir or other approved species, provided that, at the contractor's option, posts may be poles as above specified for clothesline supports but with 5-inch butts. Fabricate and erect fences, screens and/or handrails as detailed and paint as specified in the division, PAINTING AND GLAZING.

*( ) OIL STORAGE DRUMS AND CONNECTIONS AT TRAILERS

Oil storage drum shall be ICC standard of not less than 18 gauge steel, nominal capacity 55 gallons. Fit drum with threaded oil-fill and supply connections and with standard vent cap. Mount drum horizontally on carriage herein specified so that supply connection from drum is not less than 6 inches nor more than 12 inches above oil level in constant level valve at heater and side of drum is within 8 inches to 12 inches from outside wall.

a. Carriage for oil drum shall consist of two 2-inch x 4-inch X frames with two 1-inch x 4-inch crossbraces and two 1-inch x 6-inch longitudinal braces, all No. 2 yellow pine or fir or equivalent and all securely nailed together and set on two concrete pads two inches thick. A metal carriage capable of supporting three times the weight of the oil drum and contents may be used in lieu of the wood support described above. The height of the carriage shall be such as to permit installation of the oil piping as specified herein.

b. Piping shall be black, standard weight, steel or wrought iron, 3/8 inch IPS with malleable iron fittings or steel tubing not less than 1/4 inch ID with flared joints. Run supply piping from drum to oil supply pipe terminus at trailer and connect thereto. Install gate or globe valve at drum, an Underwriters approved oil filter and provide dirt leg and cap at bottom of drop. Install coil between drum and trailer to provide flexibility.

c. Locate oil drum on opposite side of trailer from entrance door.

d. Paint wood tank carriage with one coat exterior oil paint. Prime black pipe, tank and metal tank carriage with red lead paint TT-P86a and apply a finish coat of aluminum paint to piping, tank and tank carriage. *

NOTE: This page 14-3 supersedes page 14-3 of Division DHS 14, dated 2-1-52. Material * between asterisks * is new or revised.

DIVISION DHS 15

UTILITIES (SEWERS, WATER AND GAS)

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

NO SPECIFICATION IS GIVEN HEREIN FOR SEWAGE DISPOSAL FACILITIES OTHER THAN CONNECTION TO EXISTING SEWERS, NOR FOR WATER SUPPLY OTHER THAN FROM PUBLIC WATER WORKS. SHOULD SUBSURFACE SEWAGE DISPOSAL, SUCH AS SEPTIC TANKS AND TILE BEDS, BE PROPOSED OR SHOULD THE PROJECT WATER SUPPLY BE FROM WELLS, THE SPECIFICATIONS SHOULD COVER REQUIREMENTS FOR SUCH WORK.

FOR TRAILER PROJECTS, OBTAIN FROM THE CONTRACTING OFFICER, THE DETAILS OF THE WATER AND SEWER TERMINATIONS ON THE TRAILERS.

SECTION 1. SCOPE. THIS SECTION AS WRITTEN APPLIES TO TEMPORARY HOUSING PROJECTS. FOR TRAILER PROJECTS, SUBSTITUTE THE FOLLOWING:

> "Include all sewers, drains, underground water lines, appurtenances, connecting of water lines and sewers to trailers and buildings (if any) and related items, required to complete the project."

SECTION 2. TRENCHING AND BACKFILLING. IF IT IS KNOWN THAT NO ROCK WILL BE ENCOUNTERED IN TRENCH EXCACATION, OR IF FOR OTHER REASON NO CLASSIFICATION OF EXCAVATED MATERIALS IS DESIRED, REVISE PARAGRAPH c AS FOLLOWS:

> "Material to be excavated hereunder in trenches for utilities shall be non-classified and shall include all earth or other materials encountered. The Contract Price is understood to cover the removal of all such materials to the depth and extent indicated on the drawings and herein specified."

SECTION 4. SEWER CONSTRUCTION. FOR TRAILER PROJECTS ADD A PARAGRAPH f COVERING ANY REQUIREMENTS, IN ADDITION TO THOSE WHICH MAY BE SHOWN ON THE DRAWINGS, FOR CONNECTING TRAILER DRAINS TO SEWERS. CONNECTION SHOULD BE MADE BY SLIP JOINT OR BY FLEXIBLE OR SEMI-RIGID CONDUIT. IN COLD CLIMATES INSULATE EXPOSED DRAINAGE PIPING.

SECTION 5. WATER DISTRIBUTION SYSTEM MATERIALS. WITH A VERY SCANT WATER SUPPLY, PARTICULARLY IN THE CASE OF TRAILER PROJECTS, 1-1/2 or 2-INCH COMPRESSION HYDRANTS MAY BE SPECIFIED IN LIEU OF THE STANDARD FIRE HYDRANTS COVERED BY PARAGRAPH f.

SECTION 6. WATER DISTRIBUTION SYSTEM INSTALLATION. FOR TRAILER PROJECTS, DESIGNATE PARAGRAPHS j AND k AS k AND l, RESPECTIVELY, AND INSERT THE FOLLOWING (OR SHOW REQUIREMENT FULLY ON THE DRAWINGS):

> j. Water Connections to Trailers. Center the water supply pipe riser to each trailer in 6-inch sewer pipe with bell end of sewer pipe extended to 6 inches above ground level. Pack the sewer pipe with hair felt or mineral wool and provide tight plug around the water pipe riser, which shall terminate in a hose nipple with a 5/8-inch garden house connection to the trailer water supply piping. The exposed piping and the hose shall be enclosed completely in a -inch thick wrapping of hair felt, jacketed with waterproof fibre or paper tightly wired in place.

SECTION 7. GAS DISTRIBUTION SYSTEM MATERIALS. THIS SPECIFICATION CALLS FOR UNCOATED PIPE, INASMUCH AS RARELY IF EVER SHOULD THE EXPENSE OF WRAPPING OR COATING GAS LINES BE WARRANTED FOR TEMPORARY PROJECTS.

SECTION 8. GAS DISTRIBUTION SYSTEM INSTALLATIONS. UNLESS SOIL AT THE PROJECT SITE IS QUITE CORROSIVE, DELETE THE LAST SENTENCE OF PARAGRAPH a AND THE LAST SENTENCE OF PARAGRAPH c(3). THESE PROVISIONS ARE INTENDED TO FACILITATE THE INSTALLATION OF CATHODIC PROTECTION OF THE LINES IF SUCH SHOULD LATER BE FOUND NECESSARY.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

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DIVISION DHS 15

UTILITIES (SEWERS, WATER AND GAS)

1. SCOPE

Include all sewers, drains, underground water and gas distribution lines, appurtenances, and related items, required to complete the project, except (1) house sewers, (2) water services, and (3) gas services, each from buildings to points 5 feet outside of building walls, which items are specified in the division, PLUMBING. The ends of sanitary sewers and water and gas service lines shall be tightly plugged or capped at such points 5 feet from building walls, pending the connecting thereto of the building piping as specified in the division PLUMBING.

2. TRENCHING AND BACKFILLING

a. General. Unless otherwise shown, provide separate trenches for each utility -- sewer, water and gas. Excavate trenches of sufficient width for proper installation of the work.

b. Sheeting, Bracing, Water Removal. Sheet and brace trenches, and remove water, as necessary to fully protect workmen and adjacent structures and permit proper installation of the work. Under no circumstances lay pipe or install appurtenances in water; keep the trench free from water until pipe joint material has hardened. The presence of ground water in the soil or the necessity of sheeting or bracing trenches shall not constitute a condition for which any increase may be made in the Contract Price, except that when sheeting is left in place, on the written order of the Contracting Officer, the Contract Price shall be adjusted (see GENERAL CONDITIONS). Sheeting left in place shall be cut off not less than 2 feet below finished grade. Sheeting shall not be removed until the trench is substantially backfilled.

c. Rock Excavation. If "rock" is encountered within the limits of trench excavation for utilities, the Contract Price will be adjusted (see GENERAL CONDITIONS). "Rock" is defined as rock, stone, hard shale, boulders, masonry or rock fragments over 9 cubic feet in volume, that cannot be removed by an ordinary trenching machine without the use of explosives or drills.

d. Blasting. Obtain written consent and approval of method from the Contracting Officer before proceeding with blasting. Cover blasts with heavy timbers or mats. Protect pipe already laid.

e. Grading Trench Bottom. Grade the bottom of trenches evenly to insure uniform bearing for the full length of all pipes. Cut holes as necessary for joints and joint making. Excavate all rock or other hard material to at least 4 inches below the pipe. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.

f. Special Supports. Should latent soil conditions, other than hard material as referred to above, necessitate special supports for piping and/or appurtenances, including the removing of unsuitable material and refilling with other material, the Contract Price will be adjusted (see GENERAL CONDITIONS). Perform any such work as directed by the Contracting Officer.

g. Tree Protection. Exercise care to protect the roots of trees to remain. Within the branch spread of such trees perform all trenching by hand. Open the trench only when the utility can be installed immediately; prune injured roots cleanly; and backfill as soon as possible. Perform all this work under direction of the Contracting Officer.

h. Backfilling. Backfill trenches only after piping has been inspected, tested (if water or gas), and locations of pipe and appurtenances have been recorded. Backfill by hand around pipe and for a depth of one foot above the pipe; use earth without rock fragments or large stones and tamp firmly in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper, or if the soil is granular, by flooding, provided that under pavements, walks and other surfacing, the backfill shall be tamped solidly in layers not thicker than 6 inches. Exclude all cinders and rubbish from trenches in which metal pipes are laid.

3. SEWER MATERIALS

a. Sewer Pipe. Except as otherwise shown, pipe for sewers shall be standard strength clay sewer pipe meeting A.S.T.M. Specification C-13-44T, concrete sewer pipe meeting A.S.T.M. Specification C-14-41, or asbestos cement pipe meeting Federal Specification SS-P-351 or the manufacturer's standard for non-pressure pipe. Provide proper fittings for the installation and connection of all lines.

b. Joint Material. Joints in sewers shall be made with hot-poured bituminous compound or with 1:2 cement-sand mortar. Gasket material shall be dry twisted jute packing or other material approved by the Contracting Officer.

c. Brick for manholes and other sewer structures shall be sewer brick of a grade standard for that use. Mortar for bricklaying shall be 1:3 cement-sand mix.

d. Concrete shall meet the applicable requirements therefor given in the division SITE IMPROVEMENTS (ROADS, WALKS, ETC.).

e. Castings shall be of tough, even-grained, soft grey iron, free from injurious defects, and shall be given two coats of coal tar pitch varnish. Tops and gratings weighing less than 100 pounds shall have an approved locking device.

4. SEWER CONSTRUCTION

a. Existing Sewers; Connections. Make or have made all required connections to existing sewers. Carry out such work in accordance with local requirements. Check carefully the invert elevations of existing sewers to which connections are to be made. Raise or lower existing manholes, street inlets, and catch basins as necessary to conform to finished grades.

b. Sewer Pipe Laying. Test pipe for soundness and clean interior and joint surfaces before lowering into the trench. Lay the pipe with bell-end upgrade and in straight lines and on uniform grades between points where changes in alignment or grade are shown. Check the line and grade of each pipe from a top line carried on batter boards not over 25 feet apart. Bed the pipe uniformly and fit to form a smooth invert. Keep a stopper in the pipe mouth when laying is not in progress.

c. Sewer Pipe Jointing. In making bituminous joints, comply fully with the directions of the manufacturer of the compound. In making mortar joints, spread mortar in the bottom one-third of the circumference of the bell and force into the mortar a gasket thick enough to center the spigot in the bell and long enough to lap at the top; after the pipe has been shoved "home", calk the gasket into place and ram mortar into the remainder of the joint space, bevelling off the mortar at a 45-degree angle; drag a close-fitting swab past the joint within the pipe. As soon as the joint material has set, pack fine earth carefully around the joints and place and tamp earth around and over the pipe.

d. Sewer Structures. Lay brick with shove joints completely filled with mortar. Horizontal joints shall not exceed ½ inch, vertical joints 1/4 inch on their interior face. In circular structures, lay all bricks as headers, breaking joints between courses. Strike interior joint smooth with the face of the wall. Provide drop inlets into manholes on sanitary sewers for incoming lines having inverts 2 feet or more above the inverts of the manhole outlet lines. Unless otherwise shown, set castings for manholes and cleanouts at exact finished grade and depress the grates of drainage openings to 3 inches below finished grade.

e. Flushing Sewers. Flush all sanitary sewers, except dwelling connections, with water in sufficient volume to obtain free flow through each line. Remove all obstructions and correct all defects discovered. Remove all silt and trash from catch basins and inlets just prior to final acceptance of the work.

5. WATER DISTRIBUTION SYSTEM MATERIALS

a. Pipe 3-inch and larger for underground water distribution shall be either:

(1) cast iron pipe, standard, Class 150, with either bell and spigot or standardized mechanical joints, Federal Specification WW-P-421 or A.S.A. A 21.2-1939; fittings standard Class D or Class 250 short-body; pipe and fittings coated inside and out with coal-tar pitch varnish; or

(2) cement asbestos pipe, standard, Class 150, Federal Specification SS-P-351; fittings standard cast iron with all-bell connections of special dimensions as required, or with adaptors for proper jointing.

b. Pipe smaller than 3-inch for underground water distribution shall be either:

(1) wrought-iron pipe, galvanized, standard weight, Federal Specification WW-P-441a; fittings galvanized malleable iron, screwed, Class B; or

(2) steel pipe, galvanized, standard weight, Federal Specification WW-P-406; fittings galvanized, malleable iron, screwed, Class B; or

(3) cast iron pipe, manufacturer's standard for 250 pounds water working pressure, each cast length to be at least 5 feet long and have 2 tapping collars; fittings Class 250; pipe and fittings coated inside and out with coal-tar pitch varnish.

c. Pipe Jointing Material. Yarning material shall be braided hemp, sterilized by a method approved by the Contracting Officer, or rubber rings, asbestos rope, or treated paper rope free from oil, tar and grease. Joint compound shall be lead, or sulfur joint compound approved by the Contracting Officer. Gaskets for standardized mechanical joints shall be lead-tipped.

d. Valves. Valves and stops shall have ends suited, or adaptors shall be provided, for proper installation in the lines in which they are located. Valves 2-inch and larger shall be iron-body, bronze or brass-mounted double gate valves meeting local standards; valve stems shall terminate in wrench nuts. Valves 1-1/2 inch and smaller shall be standard, brass, body, round-way, ground-key stops, with T-heads and checks. Furnish suitable keys for both the gate valves and the stops.

e. Valve boxes for 2-inch and larger valves shall be approved standard cast iron, adjustable-shaft boxes; boxes over smaller valves (stops) shall be approved standard, cast iron, extension service boxes, having lid held in place by a brass bolt. Each box shall be of the size required for the size of valve and depth of line. The lids of all boxes shall bear the word "Water" or the letter "W".

f. Fire hydrants shall be an approved standard make meeting local standards. Each hydrant shall have a valve opening not less than 5-inch, and two 2-1/2 inch hose nozzles and one pumper nozzle. The length of hydrant barrel shall be determined by the specified pipe bury.

g. Water meters shall be of recognized make, meeting the approval of the local water department (company).

6. WATER DISTRIBUTION SYSTEM INSTALLATION

a. Connections to Existing Mains. Make or have made all required connections to existing water mains, arranging therefor with the local water department (company) carrying out the work to its satisfaction.

b. Handling and Storing Materials. Handle all materials so as to avoid shock or damage. Store pipe and fittings on sills above surface drainage level and deliver for laying after the trench is excavated.

c. Pipe-Laying - General. The pipe interior shall be clean and joint surfaces wiped clean and dry when the pipe is lowered into trench. Hammer-test cast iron pipe for soundness before lowering. Lay pipe true to line and without objectionable breaks in grade. The depth of cover below finished grade shall be not less than _____ feet. Give all pipes a uniform bearing on the trench bottom. Allow no trench water or dirt to enter the pipe after laying. Insert a watertight plug in the open end of the piping when laying is not in progress.

d. Pipe Laying and Jointing

(1) Jointing Bell and Spigot Cast Iron Pipe. Enter the spigot fully in the bell and center with tightly driven yarning material, leaving a uniform depth of at least 2 inches for lead or 2-1/2 inches for sulfur jointing compound. Limit the deflection at each joint so as to leave 1/4 inch minimum thickness of joint space at the face. Place lead joints at one pouring and calk watertight without straining the pipe. Make sulfur compound joints in accordance with the instructions of the manufacturer of the compound. Calk factory-made lead joints and field joints in cast iron pipe smaller than 3-inch to conform to the pipe manufacturer's directions.

(2) Standardized mechanical joint cast iron pipe shall be jointed in full accordance with the pipe manufacturer's directions.

(3) Cement-asbestos pipe shall be handled and laid in compliance with the manufacturer's published directions.

(4) Wrought iron and steel pipe shall be jointed with lubricant on the male thread only. Remove burrs and cuttings and ream or file pipe ends to size of bore.

e. Fittings and Branch Connections. Install suitable fittings at all changes in direction, dead ends and branch connections, provided that taps, in lieu of fittings, may be used as follows:

(1) On 3-inch and larger cast iron pipe, taps shall be not larger than 3/4-inch, 1-inch, 1-1/4-inch, and 1-1/2-inch, or 3-inch, 4-inch, 6-inch, and 8-inch and larger mains, respectively; lead goosenecks shall be used on all connections for ferrous branches, if fittings are not employed.

(2) On castiron pipe smaller than 3-inch, taps shall be made only at tapping collars and in accordance with the manufacturer's recommendations.

(3) On cement-asbestos pipe, taps directly into the wall of the pipe shall be not larger than 3/4-inch on 4-inch and 6-inch mains, respectively, or larger than 1-inch on 8-inch and larger mains, and lead goosenecks shall be used on all connections for ferrous branches, if fittings are not employed; flat, double-strap clamps or special tapped couplings shall be used for larger taps which in no case shall be larger than 1-1/2-inch nor larger than 1/4 of the diameter of the main; all such work shall be performed in accordance with the pipe manufacturer's recommendations.

f. Setting Valves. Test valves and stops for opening and closing, and set with stems plumb. Center boxes over valves and stops; set plumb and with tops at finished grade.

g. Setting Fire Hydrants. Before setting, clean interior and check for proper operation. Set hydrants plumb and at correct elevation for finished grade. Set each hydrant on a concrete or stone slab not less than 2 square feet in area and place at least 4 cubic feet of coarse gravel or crushed stone, mixed with coarse sand, around and under the slab, extending the fill to at least 6 inches above the hydrant waste opening.

h. Blocking. Pour concrete blocks between the undisturbed trench face and plugged ends, bends, and hydrant barrels to prevent pipe movement at calked joints; where the soil is not firm, provide, in lieu of concrete, approved tie rods and collars, painted with coal tar pitch varnish after placing.

i. Tests. Before joints are covered, test the piping, under the supervision of the Contracting Officer, for at least 2 hours at a water pressure of ____ lbs. per sq. in. Remedy to the satisfaction of the Contracting Officer any defects discovered. Continue the tests until all visible leaks, except as hereinafter specified, have been eliminated.

(1) Sulfur Compound Joints. Seepage or slow leakage from sulfur compound joints at the time of the above-specified test shall not be considered objectionable and only such joints shall be cut out and replaced as directed by the Contracting Officer. After lines containing sulfur compound joints have remained filled with water for 30 days, retest and determine the quantity of leakage; if it exceeds 100 gallons per inch of pipe diameter per mile of piping per 24 hours, make the necessary repairs to bring the leakage within such limitation.

j. Flushing Mains. Upon completion of the water distribution system, test valves to insure their full opening and flush out the lines progressively by opening hydrants and service outlets and permitting the flow to continue from each until the water runs clear.

k. Sterilization of Water Distribution System. After flushing as just specified, sterilize the system by the following or other method satisfactory to the Contracting Officer. Introduce chlorine or a solution of calcium or sodium hypochlorite, filling the lines slowly and applying the sterilizing agent at a rate of 50 parts per million of chlorine, as determined by residual chlorine tests at the ends of the lines. After the sterilizing agent has been applied for 24 hours, test for residual chlorine at the ends of the lines; if less than 5 p.p.m. is indicated, repeat the sterilization process. When tests show at least 5 p.p.m. of residual chlorine, flush out the system until all traces of the chemical used are removed.

7. GAS DISTRIBUTION SYSTEM MATERIALS

a. Pipe shall be standard weight black steel. Pipe 2-inch and larger shall have bevelled ends for welded joints. Pipe 1-1/2-inch and smaller may have threaded ends. Fittings for welded piping shall be standard-weight, approved welding fittings; fittings for screw pipe shall be threaded black malleable-iron. Mechanical-type couplings shall be of a make approved by the Contracting Officer and equipped with rubber gaskets for gas service.

b. Valves 2-inch and larger shall be standard, 125-pound, iron body, bronze mounted, double disc gate valves, or 125-pound, lubricated plug valves equipped with a grease connection readily accessible from the ground surface, and an indicator clearly visible showing whether the valve is open or closed; 3-inch and larger valves shall be flanged, smaller-sizes screwed. Valves 1-1/2-inch and smaller shall be straight way, iron body, brass plug, lock-wing, T-head gas stops. Furnish keys suitable for the valves and stops.

c. Valve boxes for 2-inch and larger valves shall be standard, cast-iron, adjustable shaft boxes; over gas stops, they shall be standard, cast-iron extension service boxes, having lid held in place by a brass bolt. The lids of all boxes shall be cast with the word "Gas". The castings shall be coated with two coats of coal-tar pitch varnish.

d. Drip pots shall be A.G.A. standard, cast iron pots of at least _____ quarts capacity each, or they may be formed of sections of steel pipe, coated after fabrication in the manner specified for joints in line piping. Each drip pot shall be fitted with a valve, and a 1-inch suction pipe extending from near the bottom of the drip pot to the surface and terminating in a sleeve and brass plug, enclosed in a service box.

e. Regulators shall be of the spring-loaded type, cast iron or semi-steel body, brass or bronze mounted, and designed for outside setting. Each regulator shall have a 1/2-inch relief valve, set to discharge at a pressure of _____ oz. per sq. in. and a vent with a downward screened opening. Regulators shall have working capacities (not exceeding 2/3 of the manufacturer's rated capacities) of at least _____ and _____ cubic feet per hour, respectively, where shown. With an inlet pressure variation of from 2 to ____ lbs. per sq. in., they shall maintain a constant outlet pressure of _____ oz. per sq. in.

8. GAS DISTRIBUTION SYSTEM INSTALLATION

a. Scope of Work. Connection to the gas company mains, and piping and appurtenances therefrom to _____, will be provided without cost to the Contractor who, beginning at that point, shall install the complete distribution system for the project. The Contractor shall provide an approved insulating coupling in the project gas supply main at or near the point where his work starts.

b. Handling and Storing Materials. Handle and store materials with care and in such manner as to minimize damage to pipe coating. Deliver for laying after the trench is excavated.

c. Pipe Jointing

(1) Welded Joints. Cutting and welding, including materials used in the welding operation, shall conform to the current "Specifications and Standards Covering the Welding of Steel and Wrought-Iron Pipe", adopted by the Heating and Piping Contractor's National Association. No water nor moisture shall be permitted to contact any weld until it had cooled to atmospheric temperature. Only competent, qualified welders shall be employed and the Contracting Officer may require the Contractor, at his expense, to cut test coupons to determine whether the welding is satisfactory, and to reweld such test pieces in the lines.

(2) Threaded Joints shall be made with lubricant on the male thread only.

(3) Mechanical type couplings shall be installed on one side of and adjacent to, elbows in welded lines and on welded branch lines adjacent to tees. Such couplings may be used also in tie-ins of lines jointed over the trench. At all mechanical joint couplings provide a jumper of No. 4 soft iron wire spot-welded to the pipe at each side of the coupling.

d. Testing. After each section of the piping is laid, test under an air-pressure of 50 lbs. per sq. inch for at least two hours and, if the pressure gage indicates any leak, make all necessary repairs. Furnish the requisite equipment and services for these tests.

e. Pipe Laying. Lay piping with continuous bearing on the trench bottom, sloping service lines to mains, and mains to drip pots at low points, the minimum slope to be 0.10%. Depth of cover below finished grade shall be at least _____ inches. Wherever a gas line crosses, within 4 inches from, another underground metallic conduit, place an approved insulating block between the two lines. Prevent the entrance of dirt and water into the piping. Blow out all lines before final connections are made. Backfill around pipe and for a depth of 6 inches above the pipe with earth free from stones or hard clods.

f. Fittings and Service Connections. Install proper fittings at all changes in directions, dead ends, and branch connections. Provide suitable adaptors where needed. Use standard welding outlets for service connections to 3 inch and larger lines.

g. Setting Valves. Check valves and stops for opening and closing, and set with stems plumb. Center boxes over valves and stops; set plumb and with tops at exact finished grade.

h. Purging. Purge with gas to remove all air from the distribution system, which shall be ready for service at the time of acceptance of the work.

9. CERTIFICATES

Furnish to the Contracting Officer affidavits from the manufacturers of pipe, fittings, valves, meters and fire hydrants furnished and installed under this division, certifying that such materials delivered to the project conform to the requirements of this specification.

10. AS-BUILT DRAWINGS

At completion of the work, deliver to the Contracting Officer one set of white prints of the utility drawings, showing in drawing ink all deviations from the contract drawings in size, line or grade, and recording the exact final location of sewer, water and gas lines, including bends, valves, ends of sewers, etc., by offset distances to surface improvements such as buildings or curbs.

DIVISION DHS 16

PLANTING

NOTES TO THE ARCHITECT-ENGINEER:

THESE NOTES ARE FOR THE USE OF THE ARCHITECT-ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

ALL DISTURBED LAND, NOT OCCUPIED BY TRAILERS, BUILDINGS OR OTHERWISE SURFACED, SHALL BE FINISH GRADED AND PLANTED WITH GRASS OR OTHER SUITABLE GROUND COVER TO PREVENT EROSION, MUDDY OR DUSTY CONDITIONS. WHEN THE COMPLETION DATE FOR THE PROJECT IS AT A SEASON UNSUITABLE FOR ESTABLISHMENT OF GROUND COVER AND OTHER PLANTING, EXCEPTING AT EXCESSIVE COST, THE PLANTING SPECIFIED SHALL OMIT TREES, SHRUBS AND VINES: AND WHERE GRASS OR OTHER SUITABLE GROUND COVER IS NORMALLY USED, TEMPORARY MEANS OF EROSION CONTROL SHALL BE SPECIFIED IN ACCORDANCE WITH LOCAL PRACTICE.

WHEN PROJECTS ARE LOCATED IN AREAS WHERE VEGETATIVE GROUND COVER CANNOT BE READILY ESTABLISHED, AN APPROPRIATE SPECIFICATION FOR USE OF OTHER MATERIALS AND METHODS TO PREVENT EROSION MUST BE WRITTEN TO CONFORM WITH ACCEPTABLE LOCAL PRACTICE.

A LIST OF PLANT MATERIALS, SHOWING SCIENTIFIC NAME, COMMON NAME, SIZE AND QUANTITY SHALL BE SHOWN ON THE PLANTING PLAN OR OTHER DRAWING INDICATING PLANTING.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

DIVISION DHS 16

PLANTING

1. SCOPE

Include furnishing all materials, equipment and labor necessary for preparation of areas to be planted, applying fertilizer, planting, protection, and maintenance of planting required to complete the work shown on the drawings and specified. Grading shall have been completed under Division, CLEARING, EXCAVATING, FILLING AND GRADING.

2. MATERIALS

a. Water used in this work will be furnished by _____. Hose and other watering equipment required for the work shall be furnished by this contractor.

b. Ground Cover

( ) Grass seed shall be mixed and guaranteed by the dealer to be as follows:

Common Name	Proportion by Weight	Purity %	Germination %

( ) Sprigs shall be _____ grass. They shall be healthy, vigorous, freshly dug, free of pernicious weeds and shall be protected until planted.

( ) Sod shall be at least 60 per cent _____ grass; freshly cut, living, strongly rooted and free of pernicious weeds. It shall be mowed to a height not to exceed three inches immediately before lifting and shall be of uniform thickness with not over 1-1/2 or less than one inch of soil.

( ) Collected ground cover may be obtained from designated areas on the site or from approved sources off the site. Collected ground cover shall consist of suitable vegetation and its roots growing in topsoil. It shall be low growing or capable of maintenance at suitable height for the location in which it is to be used and shall be free of objectionable plant growth.

( ) Hay mulch containing seed shall be mature hay containing a maximum quantity of viable seed of native grasses or other desirable species approved by the Contracting Officer.

( ) Trees, Shrubs, and Vines

(1) Nomenclature - The name of plants required under this contract conform to those given in Standardized Plant Names, 1942 Edition, revised, as prepared by the American Joint Committee on Horticultural Nomenclature.

(2) Standards, Quality and Size - Plants shall have a habit of growth that is natural for the species, and shall be sound, healthy, vigorous, and free from insect pests, plant diseases and injuries. All plants, before pruning, shall equal or exceed the measurements specified in the Plant List.

c. Approval of Materials. Within 10 days following acceptance of the bid, the Contracting Officer shall be notified of the sources of the materials required or desired to be inspected or tested.

3. CONSTRUCTION METHODS

a. Time of Planting. The contractor shall be notified in writing, when other divisions of the work have progressed sufficiently, to commence work of finish grading and planting. Thereafter, planting shall be conducted under favorable growing conditions. No soil shall be worked in a frozen or muddy condition.

b. Applying Fertilizer. A 10-6-4 commercial fertilizer shall be applied uniformly to all areas to be planted at the rate of 25 pounds to 1000 square feet. Fertilizer may be applied with seed. Fertilizer for sod shall be applied after the sod is established and when the surface is dry, then immediately and thoroughly watered in.

c. Planting Ground Cover

( ) Seeding shall be done evenly with a mechanical spreader at the rate of 2 1/2 pounds to 1000 square feet on freshly scarified surface and lightly raked. If the seeded area is watered, watering shall be continued to maintain the soil moisture until the grass is established.

( ) Sprigging. Sprigs shall be planted three inches deep with ends overlapping in furrows 18 inches apart, preferably parallel with the contours. Sprigs shall be covered before soil is dried out, the surface levelled to established grade, compacted, and thoroughly soaked by watering with a fine spray.

( ) Sodding. Sod shall be laid with no voids on freshly scarified, smoothly compacted surface, tamped or rolled and thoroughly watered.

( ) Sod on Slopes steeper than 2 to 1 shall be held in place by wooden pins about one inch square and about six inches long driven flush with the surface of the sod.

( ) Collected ground cover shall be planted to cover the surface. The soil shall be firmly compacted about the roots by tamping and watering.

( ) Hay mulch containing seed shall be spread evenly to cover the area and lightly cut in to the soil to prevent displacement by wind.

( ) Planting Trees, Shrubs and Vines. Planting methods and protection shall conform to acceptable local practice. Soil shall be as found on the site.

d. Clean-up. Upon completion of ground cover and other planting work all excess soil, stones, and debris shall be removed.

4. MAINTENANCE

Beginning immediately after planting, ground cover and other planting shall be protected and maintained by watering, mowing, and replanting, as necessary, for at least 30 days or until all planting and ground cover is established in good growing condition.

5. INSPECTION AND ACCEPTANCE

a. Inspection for acceptance of all or a substantial part of the work will be made by the Contracting Officer upon completion of the planting and upon written notice requesting such inspection submitted by the Contractor at least 10 days prior to the anticipated date. The condition of ground cover and other planting will be noted and the contractor advised whether maintenance shall continue in any part.

b. Acceptance. After inspection, the contractor will be notified in writing of acceptance of the work in whole or in part or of the requirements for completion. Planting shall be alive and in good condition at the time of acceptance.

DIVISION DHS 17

ELECTRICAL DISTRIBUTION

NOTES TO THE ARCHITECT OR ENGINEER:

THESE NOTES ARE FOR THE INFORMATION OF THE ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS DIVISION IS TO BE INCLUDED IN THE PROJECT SPECIFICATIONS WHEN ELECTRICAL ENERGY IS PURCHASED WHOLESALE.

MATERIALS AND METHODS ENUMERATED HEREIN ARE BASED ON PRIMARY SERVICE NOT EXCEEDING 6600 VOLTS, AND SECONDARY SERVICE NOT EXCEEDING 750 VOLTS. WHENEVER THE PRIMARY VOLTAGE EXCEEDS 6600, CONSULT WITH THE LOCAL UTILITY COMPANY AS TO PROPER STANDARDS.

INDICATE ON DRAWINGS ALL NECESSARY DETAILS NOT INCLUDED IN THE SPECIFICATIONS TO PROPERLY ILLUSTRATE THE WORK TO BE PERFORMED.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

PARAGRAPHS MARKED THUS ( ) COVER VARYING TYPES OF MATERIALS AND INSTALLATION METHODS FOR USE IN CONNECTION WITH PRIMARY SERVICE AND PROJECT YARD LIGHTING WHICH MAY NOT BE REQUIRED IN THE PROJECT SPECIFICATION. SELECT THE TYPE OR TYPES SUITED TO YOUR PROJECT AND OMIT THOSE NOT SUITABLE.

ADD A NUMBER OR LETTER TO PARAGRAPHS MARKED THUS ___, AND REVISE PARAGRAPH IDENTIFICATION AS NECESSARY.

DIVISION DHS 17

ELECTRICAL DISTRIBUTION

1. SCOPE

Include the overhead electrical distribution system and items included in this division required to complete the project. See the drawings and General Scope of Work for extent of work.

a. Systems. The overhead electrical distribution system for light and power shall commence at the _____ located _____ at a delivery voltage of _____ volts, _____ phase, _____ wire, _____ cycle.

(1) Secondary distribution shall be 120/240 volts, single phase, 3 wire, 60 cycle.

(2) The project master meter and final connections will be furnished and installed by the utility company. This contractor shall furnish and install such equipment as may be required by the utility company in accordance with its requirements, and shall pay all required fees, meter, service, and connection charges (at no added cost to the Government), as a part of this work.

(3) The final connections to all buildings and/or trailers including the installation of cable supports is a part of this work.

(4) The telephone system shall consist of wire and/or cable furnished and installed by others, on project poles.

(5) Project area lighting shall consist of a multiple lighting circuit, 120 volt, single wire, controlled from time clock to actuate contactors located on project poles. Lighting fixtures are included as a part of this Division of the Specifications.

2. GENERAL REQUIREMENTS

a. The contractor shall base his bid upon the plans and specifications, but such installations shall comply with the latest applicable rules and regulations of the National Electrical Code, National Electrical Safety Code and local utility company practice bearing on the installation of the work. The contractor's attention is directed to article "Permits and Codes" of the General Conditions.

b. On completion of work, furnish a one-line feeder diagram showing (1) point of service contact, (2) routing of primary feeders and sizes, (3) transformer stations and disconnects (4) routing of secondary feeders

and sizes, (5) service loops and sizes and (6) any other pertinent information of value to an operating engineer and for permanent record. This diagram shall be not less than 18 inches by 24 inches, in ink on tracing cloth and submitted to the contracting officer for approval and retention.

3. MATERIALS AND APPLIANCES

Materials and appliances of types for which there are Underwriters' Laboratories standard requirements, listing or labels, shall have listing of Underwriters' Laboratories and be so labeled, or shall conform to their requirements, in which case certified statements to that effect shall be furnished, if requested. Use new materials and appliances throughout.

Materials other than those listed herein shall be the size, type, and capacity indicated by the drawings and the specifications. Insofar as possible, use one type and quality. Materials and appliances shall conform to the standard listed with each item in the following paragraphs.

a. Poles shall be southern yellow pine, western red cedar, or northern white cedar, ASA Specification 05.1 - 1948. They shall be reasonably free of knots or knot holes and reasonably straight grained.

(1) Brand poles 12 feet from butt with the following information: month and year of treatment, manufacturer's trade mark or initial, class (ASA) and height.

(2) All angle and transformer poles shall be at least class 4 and all line poles shall be at least class 5.

(3) Pine poles shall be treated full length by a preservative in accordance with American Wood Preservers Association Standard Specification T4-49 (full or empty cell process) after poles have been roofed, drilled, and grained. If additional gains are required, use metal gains. After treatment, exercise care in handling to prevent scarring and splintering of surface.

(4) Cedar poles shall be butt treated with creosote by any process which will produce inpregnation of not less than 1/2 inch depth or full sapwood penetration where sapwood is less than 1/2 inch in depth. Impregnation shall extend from at least 2 feet below grade to at least 1 foot above grade.

b. Insulators shall be wet process porcelain or other equally suitable process as regards electrical and mechanical properties; true to shape, free from flaws, with grooves of proper size to accommodate conductors. Provide brown glaze on ungrounded conductors and white glaze on grounded conductors. All insulators shall be treated for radio interference.

c. Hardware shall be ferrous metal, protected by hot dip galvanizing.

d. Secondary conductors shall be medium hard drawn copper with triple braided weatherproof covering, No. 3 AWG and smaller shall be solid, larger sizes shall be stranded.

e. Service drop cable shall consist of parallel insulated conductors with concentric uninsulated neutral. Insulation (ASTM Specification D353-41), conductors, (ASTM Specification B2-40), with weather resisting outer covering, or single conductors as noted under paragraph d, "Secondary Conductors."

f. Guy wire shall be copper clad steel or double galvanized steel.

g. Guy anchors shall be log (pressure creosote treated), screw, cone, or wedge (expending type), of the size and type as required or as indicated on the drawings.

h. Guy guards shall be 14 gauge steel, hot dip galvanized, 8 feet long. In lieu of steel, guards may be wood, pine, or fir, one piece or sectional, not less than 8 feet long. Apply two coats of white paint.

i. Anchor rods shall be copper clad steel, or galvanized steel. They shall have an integral eye or double eye as required; minimum size 5/8 inch diameter, 6 feet long, 18,500 pounds guaranteed minimum strength.

j. Ground rods shall be copper clad steel, or galvanized (stiff high carbon) steel.

Under ordinary conditions, use 5/8 inch by 8 feet minimum rods. They shall have stamped into the surface, near top end, the name of manufacturer and a figure denoting length of the rod.

k. Ground clamps shall be bronze, copper, or copper clad steel.

l. Ground wire shall be soft-drawn copper at least the size of the primary and not less than #6 AWG.

m. Tape (friction) - ASTM Specifications D 69-48T.

( ) Cross arms shall be yellow pine (to be treated as specified for pine poles), or fir (may be stained but not painted). They shall be selected, straight grained, well seasoned, surfaced, roofed, and drilled.

( ) Cross arm pins shall be clamp type forged steel, or locust.

( ) Primary conductors shall be bare, (1) medium hard drawn, solid copper, (2) copper-clad steel, (3) medium hard drawn aluminum, (4) aluminum reinforced with steel, or (5) high strength low resistance steel heavily galvanized, sizes as indicated.

( ) Transformers shall be:

(1) Voltage rating, primary _____, secondary 120/240.

(2) Voltage taps as per Table IV - Federal Specification W-T-631.

(3) Type of mounting - as indicated on drawings.

( ) Conventional type. Federal Specification, W-T-631, Type I.

( ) Complete self-protected type - Federal Specification W-T-613, Type III.

( ) Lightning arrestors for conventional type transformers shall be of type which will prevent flow of dynamic current after surge has been discharged and shall limit rise in surge voltage to a value well within impulse strength of windings. Test requirements to be in accordance with AIEE Standards and ASA Specification 62.1 - 1944.

( ) Transformer fuses, for conventional type transformers shall be of the expulsion, porcelain houses, indicating type with clamp hangers and fuses (NEMA Specification 38-53).

( ) Yard lighting fixtures shall consist of 16-inch porcelain enameled steel flat cone reflector and suitable porcelain medium screw base socket for 2500 lumen lamp, with waterproof hood or cap, tapped for 1-1/4 inch conduit, suspended from pole by gooseneck or suitable bracket of 1-1/4 inch galvanized conduit securely fastened to pole by cast flange with tapped hub. Center of light source shall be approximately 4 feet from near side of pole. Wiring to lamp socket shall be concealed.

( ) Street lighting relay or contactor shall be of the pole mounted weatherproof type of capacity as indicated on drawings.

( ) Time switch shall be of the self-starting synchronous motor type with astronomical dial, single pole, 125 volt, 60 cycle, of capacity indicated on drawings with circuit protection consisting of 30 ampere fused cut-out.

4. GENERAL INSTALLATION REQUIREMENTS

a. Supporting structures, wires, and other equipment shall conform as to strength, clearances, sags and other items with National Electrical Safety Code. Use Grade B construction, using safety factor of 2.

b. Stake out pole and guy locations as soon as field conditions permit and obtain project engineer's approval. Indicate finished grade and pole number on stakes. The right is reserved to make any reasonable change in locations up to time of approval of staked locations without involving additional costs.

c. String wires from pay out reels and protect weatherproof wire braiding against injury in pulling. Give all conductors and initial stretch equivalent to maximum loading tension for five minutes, then sag to normal tension corresponding to stringing temperatures.

d. Tensions and sags shall be according to National Electrical Safety Code, Sec. 26, Par. 261, F-4.

e. Splice copper and aluminum conductors with sleeves twisted at least 3-1/2 complete turns. Splice steel conductors with at least 2 mechanical connectors spaced not more than 4 inches apart and turn free end of conductor 180° or splice in accordance with manufacturer's instructions. Use solderless connectors in making taps. Tape joints and taps with four layers of friction tape, painted with weathproof insulating compound. No span shall contain more than two splices per conductor; locate splicing sleeves at least 3 feet from conductor supports.

( ) Place conductors of highest voltage on upper cross arm positions; wire of same circuit shall occupy same relative pin positions on successive poles throughout project.

5. POLE INSTALLATION

a. Length of poles shall be sufficient to provide required clearance above ground, foreign wires and other obstructions, and of strength to support load placed upon them. Wire shall not pass over buildings.

b. For trailer projects use pole lengths not less than 25 feet for guy stubs, 30 feet for standard construction, and 40 feet for joint construction and/or transformer pole, except that poles carrying secondary rack only, or secondary rack and telephone cable, shall not be less than 30 feet. For temporary projects use pole lengths not less than 30 feet for guy stubs, 35 feet for standard construction, secondary only, or secondary and telephone cable installation.

c. Frame and fit poles, wherever practical before setting, with cross arms, braces, pins, racks, etc; arrange framing and placing of equipment to permit ready climbing. Roof poles one way, at angle of 15 degrees to horizontal.

d. Set poles along streets and alleys, 8 inches from inside edge of curb to nearest pole surface, unless local ordinances require greater distance. Protect poles, in alleys and on corner of alleys, with metal guards or butt plates to prevent injury from vehicle hubs.

e. Determine depth of setting by holding power of earth and length of pole. In loose and swampy ground, provide additional reinforcement to assure stability, such as increased depth, guying, concrete and rock. Setting of poles shall be such as to withstand loads placed upon them. See National Electrical Safety Code, Sec. 25, Par. 252, A, B, and C.

f. Poles, subject to loads which can not be supported by anchors and guys and when strain is sufficient to distort the line, shall be reinforced by creosoted planks not less than 3 inches to 4 inches by 4 feet long or concrete (1-2-4 mix) for full depth and extended above ground line with tapered finish.

g. Dig holes as small in diameter as practical, uniform at top and bottom, only large enough to admit tamping bar around pole. Set poles in alignment and plumb except at corners, dead ends, angles and other points of strain where a slight rake against direction of strain shall be given. After pole is in position, tamp dirt firmly in place around pole and bank excess dirt around pole.

h. Avoid abrupt changes in line level; where ground contour is irregular, provide poles of varying lengths to maintain as even a conductor line as practical. Where considerable change in grade elevation occurs, poles should be of heights and spacing that will not create steps greater than 5 feet per span.

i. Provide pole steps perpendicular to the line on poles carrying transformer or lighting fixtures; lowest step to be 8 feet from ground and on the field side.

j. Set poles so that alternate cross arm gains face in same direction, except at dead ends where gains of last two poles shall face dead end; use double arm construction at dead ends and line angles 30° or greater.

(__) CROSS ARM INSTALLATION

a. Cross arms shall be of size and strength to accommodate conductors and equipment. Use single cross arms except in line terminals, line angles of 30 degrees and greater, highway crossings, or other points where there is an excessive strain, use double arms.

b. Buck-arms shall be installed where required, approximately midway between and at right angles to line arms, allowing for climbing space.

c. If locust pins are used, dip in hot creosote, fit in pin holes and fasten in place with 4d nails driven through side of arm into pin; place pins in all pin holes.

d. Fasten cross arms, except transformer arms, with standard flat braces, using double sets for double arms. Fasten transformer cross arms with angle braces having 48 inch spread for 8 foot arm and 60 inch spread for 10 foot arm. Use machine bolt in fastening arms to pole and double arming spacer bolts at ends on double arm construction. Use machine or carriage bolts in fastening braces to arms and lag screws in fastening braces to poles.

e. Provide washers where bolts or screws bear on wood surfaces. Bolt ends shall not extend more than 1/2 inch beyond nut.

(__) PRIMARY LINE CONDUCTOR INSTALLATION

a. Use top groove of insulators for (1) conductors No. 2 AWG and larger, and (2) line voltage 5000 and over. Attach conductor to top groove on straight portions of lines; at angles or corners, attach wire to side of insulator and always on such side that strain will come on insulator and not on the tie wire.

b. Use side groove of insulators for (1) conductors smaller than No. 2 AWG and (2) line voltages less than 5,000. On straight portions of line, attach conductors on insulator side nearest pole, except on pole pins where conductor shall be away from pole. At angles or corners, attach wire to such side of insulator that strain will come on insulator and not on the tie wire.

c. Securely tie conductors to pin insulators with tie wires. Give one complete turn around insulator and at least four complete turns around conductor.

d. In dead-ending primary conductor for cross arm installation use standard pin type insulators on double arms. Wrap conductor once around rear insulator, then diagonal to front insulator wrap once around this insulator, then clamp free conductor end to conductor with two wire rope guying clips; tighten U bolts until they make complete exterior surface contact with conductor.

e. In dead-ending primary conductors for pole top installation, use suspension type insulator in strain position. Form conductors around dead-end thimble clevis and clamp free end to conductor with mechanical connectors.

f. Pole top steel insulator pins may be installed for single phase (single potential) primary conductor installation, in lieu of cross arms with standard insulator pins.

__. SECONDARY LINE CONDUCTOR INSTALLATION

a. Carry secondary circuits 250v and less on secondary racks. On straight line construction, tie conductors to spools on side toward pole; at angles or corners, tie to spools on side away from strain.

b. Locate secondary neutral conductor in top spool of rack when using white insulator. When no secondary phase conductor is installed on a pole, the neutral conductor shall occupy the same position throughout, supported by neutral wire brackets and insulators.

c. Along streets and alleys, secondaries shall be on field side of pole.

d. On straight lines, attach racks by through bolt at top and lag screws at bottom. At angles, transformer poles, dead end poles, heavy service take-offs, and other points of unusual strain use two through bolts.

e. In dead-ending No. 3 conductors and smaller, wrap once around spool insulator and give one long turn and six short turns around conductor. In dead-ending conductors of larger size, wrap once around spool insulator and clamp free end to conductor with "wire rope guying clips" or "guy clamps" of size to fit over insulation. In using "wire rope guying clips," tighten U bolt until it cuts through insulation making contact with conductor.

__. SERVICE LOOP INSTALLATION

a. Extend service drop from secondary line on pole to trailers and/or building and connect to trailer and/or building service conductors installed under "INTERIOR ELECTRICAL WIRING" division (for Trailers and Temporary Projects).

__. GUY INSTALLATIONS

a. Provide guys wherever necessary to hold cross arms and pole structure in proper position and to provide additional strength to support loads greater than structure alone will safely support. At unbalanced tensions, such as corners, angles, and dead-ends, attach guys at center of load and in line with resultant loading.

b. Strength of guys shall be sufficient to withstand National Electrical Safety Code loadings and tensions based on supporting the entire load in direction in which it acts.

c. Place guy anchors, wherever practical, a distance (lead) from pole equal to height of guy attachment, to limit stresses on anchor and guy. Anchor may be placed closer to pole but not less than 3/8 the height of guy attachment. Multiply the following factors by the total horizontal conductor load for different ratios of "lead" divided by "height" to obtain actual guy tension.

Ratio "Lead" to "Height"	Multiplier
1	1.41
3/4	1.67
1/2	2.24
3/8	2.86

d. Side guy line angles 10 degrees and over. Angles up to 60 degrees shall have single guy, placed to split line angle. Angles greater than 60 degrees shall have guys in both directions.

e. Install guy stub poles to provide clearance for guy wires which cross streets or obstructions.

f. Arm guys should be approximately horizontal. Fasten guy to double arming bolts by eye bolt, eye nut, or clevis. Install guy in position before line conductors are placed under tension. Where guy is attached to pole, serve twice around pole, hold in position by two guy hooks, protecting pole by three strain plates. Use molding strain plate where pole grounds occur. For light guying, use lag screws in fastening guy hook; for dead ends, use machine bolts.

g. Provide two strain insulators in all down guys, one 4 feet from pole and the other at least 8 feet from ground, or ground guys, as required by Sec. 283, B.4, National Electrical Safety Code.

h. For average loading conditions, use patent anchors, with rod and thimble eye; provide twin eye rods where telephone messenger cable may be attached to poles; anchor eye shall not extend more than 12 inches above ground.

i. For heavy loading conditions, use log anchors, (fully pressure creosoted) 12 inches by 12 inches by 4 feet minimum. Log anchors may be used in lieu of patent anchors for average loading conditions.

j. Securely attach pole guy at poles by means of "guy attachment hook."

k. In make-up of guys, wire strands shall befastened as follows:

(1) 1/4 inch strands - served at least 4 wrappings per strand.

(2) 5/16 inch and 3/8 inch strand - one 3-bolt standard clamp.

(3) 7/16 inch and larger - two 3-bolt standard clamps.

Place clamps 3 inches from strain insulators and a distance from pole equal to twice pole diameter. Cut strand 12 inches beyond the end of outer clamp and hold in place by wire wrapping or metallic clip.

l. Guys shall be placed and pulled up before conductors are strung. In placing guys, the tops of poles shall be "pulled over" so that when load is applied and guys and anchors have settled, pole tops will come back in line.

m. Install guy guards on all anchor guys.

(__) TRANSFORMER INSTALLATION

a. Stencil the KVA rating in 3 inch white numerals on tank in location visible from grade.

b. Place transformers in lowest practical position.

c. Mount single transformer of 25 KVA or under, directly on pole by use of standard supporting lugs. For larger size transformers, or where two or more transformers are required, mount on cross arm with conventional hanger iron.

( ) Cutouts for conventional type transformers shall be installed with clamp hangers and fuses in all phase wires at transformers of 4 KV rating of following sizes.

Transformer KVA	Cutout Amps	Fuse Size (amperes) 1ø 2300 V 3ø 4000 V wye	3o 2300 V Delta
5	50	5	10
7.5	50	10	15
10	50	10	20
15	50	20	30
25	50	30	50
37.5	50-100	40	75
50	100	60	100

The above sizes are based on 250 percent transformer rating; fuse transformers equipped with integral fuses, 1-1/2 times ampere sizes given above.

( ) Install cutouts for conventional type transformers in an accessible location on transformer cross arm and on the side away from transformer, connected so that the fuse holder is dead in an open position.

( ) Connect primary leads for self-protected type transformers to primary lines by means of hot line clamps to facilitate placing the transformer in and out of service.

(__) LIGHTING ARRESTOR INSTALLATION

For conventional type transformers install on each primary phase wire an arrestor at transformer lead between cutout and overhead line.

__. GROUNDING

a. Grounds shall be provided for (1) secondary lines, one side of 2 wire system, neutral of 3 and 4 wire systems; (2) ground terminal of each lighting arrestor, (3) operating rods of mechanically operated disconnecting switches, and (4) transformer tanks.

b. Secondary neutral conductor shall be grounded at each 300 to 350 feet of secondary line and at each end of line. Tie the secondary and lighting arrestor grounds together at transformer poles by the most direct connection and connect to a common driven pole ground or water main.

c. Driven ground shall be of length to reach below permanent moisture level and insure low ground resistance, except that where rock is encountered, grounds are to be made by (1) connections to water mains, (2) connections to adjacent well-grounded secondary neutral, or (3) installing counterpoise which is well grounded at both ends.

d. Pole ground connections shall be at least as large as primary conductor and not less than No. 6 AMG wire; covered with hot creosote dipped moulding and fastened to pole with staples. Place moulding over entire length of ground wire including cross connections on underside of cross arms to ground rod connections at base of pole. Provide connections to ground rod with ground wire clamp.

__. FINAL TEST

At the time of final inspection, all connections from utility company's supply to transformers and equipment shall be completed, together with all pole ground connections; transformer fuses shall be in place and circuits continuous to point of secondary contact on buildings. Prior to energizing the overhead distribution system, building service switches shall be placed in open position. Voltage tests on the line side of all building service switches shall be made. Correct voltage errors and phase relations before placing building electrical system in service. Provide all testing equipment necessary to conduct tests. Notify the project engineer at least two days before conducting tests.

__. TELEPHONE CABLE AND WIRE INSTALLATION

No labor or material shall be furnished in connection with the telephone installation unless specifically called for. The contractor shall place and space conductors, protective devices, transformers, lighting fixtures, etc., on poles so as to give clearances, in accordance with National Electric Safety Code, for the future installation of project telephone cables or wires.

(__) YARD AREA LIGHTING INSTALLATION

A multiple lighting system shall be employed, connecting the project area lighting units to a secondary system. Provide a pilot circuit controlled by a time clock. The time clock shall actuate a number of relays which in turn shall control the power lines supplying the lighting units. Provide a manually operated switch for use when the time clock becomes inoperative. Center line of lamps to be 16 feet above grade.

(__) TRAILER (ground connection)

a. Furnish and install a bonding jumper between the underground incoming water service pipe and the water pipe connection on the trailer.

(1) Bonding jumper shall be #6 copper wire securely fastened to approved type ground clamps at each end to provide continuity of ground (around garden hose connection) from trailer to underground water service pipe.

DIVISION DHS 18

REFRIGERATORS, ELECTRIC

NOTES TO THE ARCHITECT OR ENGINEER:

THIS SHEET IS FOR THE USE OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS SPECIFICATION MAY BE USED AS A PART OF THE GENERAL CONTRACT SPECIFICATIONS OR IN CONNECTION WITH A SEPARATE CONTRACT FOR PURCHASE OF ELECTRIC REFRIGERATORS.

IN SELECTING TYPE OF DOOR SWING FOR THE PROJECT, PROVIDE LEFT HAND DOOR SWING FOR SERIES 1 DWELLINGS.

CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES DEFINING NUMBER OF REFRIGERATORS AND DOOR SWING REQUIRED. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 18

REFRIGERATORS, ELECTRIC

1. SCOPE.

Include the furnishing and delivering of _____electric refrigerators as hereinafter specified.

2. DESCRIPTION

a. Capacity. 6 cubic feet, NEMA rating.

b. Operating Service. 115 volts, single phase, 60 cycle.

c. Overall Dimensions. Not more than 25 inches wide, 29 inches deep, 56 inches high.

d. Federal Restrictions. Amount of critical material used in construction shall not exceed limits established by Federal agencies having control over such limitations.

e. Applicable Specifications. Refrigerators shall conform to the Federal Specification AA-R-211b, dated December 4, 1950, Type I, except that inner liner of door may be a laminated thermosetting material, with white facing incorporated in the laminate or finished with a white organic finish over baked-on primer.

(1) All refrigerators to be _____ hand door swing.

3. DELIVERY. The electric refrigerator shall be delivered to the project, free from damage and blemishes. After connections are made as required under the Division INTERIOR ELECTRICAL WIRING, place in operation and check for proper performance, certifying to the contracting officer that the equipment has been tested in place and found satisfactory. Energy required for testing shall be supplied at Government's expense.

4. INSTRUCTIONS.

a. Furnish the following replacement lists and operating instructions to the contracting officer.

(1) Operating -- Furnish printed sets of operating and maintenance instructions in or attached to each refrigerator and spare sets amounting to 10% of the total number of refrigerators.

(2) Replacement parts list - minimum number of five printed sets.

(3) Service manuals including complete wiring diagram - minimum number of three printed sets.

5. GUARANTEE

a. Contractor shall guarantee that if equipment becomes inoperative, as defined in the following paragraph, he will, within 12 hours after being notified of such condition, repair, replace and install any part free of charge (except enamel, porcelain and lacquer) necessary to make it operative. The guarantee shall continue for one year, beginning on the day following the "Final Installation Test." This guarantee does not apply to damage due to abuse or misuse.

b. A refrigerator shall be considered inoperative within the meaning of the preceding paragraph when the interior cabinet temperature rises above 50 degrees F. and is maintained at such temperature for 6 or more consecutive hours after the usual normal adjustments have been made, or other mechanical and electrical trouble affecting normal operations has been corrected.

6. COOLING UNIT REPLACEMENT

a. The contractor shall furnish new or reconditioned cooling system units, replacing in refrigerator furnished under this contract any units which become defective (excluding damage due to visible abuse), during a four-year period, commencing at the expiration of theone-year guarantee period. The contractor shall provide the labor and materials required to make the exchanges. Defective units become the property of the contractor.

b. The contractor shall submit to the contracting officer THE NAME AND ADDRESS OF THE AGENT WHO WILL FURNISH SERVICE in connection with the guarantee and unit replacement as herein specified.

7. AFFIDAVIT. An affidavit shall be submitted to the contracting officer certifying that the electric refrigerators furnished under the contract conform to the requirements stated in this specification.

DIVISION DHS 18a

REFRIGERATORS, GAS

NOTES TO THE ARCHITECT OR ENGINEER:

THIS SHEET IS FOR USE OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS SPECIFICATION MAY BE USED AS A PART OF THE GENERAL CONTRACT SPECIFICATION OR IN CONNECTION WITH A SEPARATE CONTRACT FOR PURCHASE OF GAS REFRIGERATORS.

IN SELECTING THE TYPE OF DOOR SWING FOR THE PROJECT, PROVIDE LEFT HAND DOOR SWING FOR SERIES 1 DWELLINGS.

CHANGE AS NECESSARY TO MEET THE PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES DEFINING NUMBER OF REFRIGERATORS, AND DOOR SWING REQUIRED, AND TYPE OF GAS TO BE AVAILABLE AT THE PROJECT. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 18a

REFRIGERATORS, GAS

1. SCOPE.

Includes the furnishing and delivering of _____ gas refrigerators as hereinafter specified.

2. DESCRIPTION

a. Capacity. 6 cubic feet, NEMA rating.

b. Operating Service. _____gas, _____Btu per Cu. Ft.

c. Overall Dimensions. Not more than 25 inches wide, 30 inches deep, 56 inches high.

d. Federal Restrictions. Amount of critical material used in construction shall not exceed limits established by Federal agencies having control over such limitations.

e. Applicable Specifications. Refrigerators shall conform to the American Standard Approval Requirements for Refrigerators Using Gas Fuel (ASA Z 21.19 - 1942, reaffirmed 1950).

(1) All refrigerators to be _____ hand door swing.

3. DELIVERY. The gas refrigerator shall be delivered to the project, free from damage and blemishes. After connections are made as required under the division PLUMBING, place in operation and check for proper performance, certifying to the contracting officer that the equipment has been tested in place and found satisfactory. Fuel required for testing shall be supplied at Government's expense.

4. INSTRUCTIONS

a. Furnish the following replacement lists and operating instructions to the contracting officer.

(1) Operating - Furnish printed sets of operating and maintenance instructions in or attached to each refrigerator and spare sets amounting to 10% of the total number of refrigerators.

(2) Replacement parts list - mininum number of five printed sets.

5. GUARANTEE

a. Contractor shall guarantee that if equipment becomes inoperative, as defined in the following paragraph, he will, within 12 hours after being notified of such condition, repair, replace and install any part free of charge (except enamel, porcelain and lacquer) necessary to make it operative. The guarantee shall continue for one year, beginning on the day following the "Final Installation Test." This guarantee does not apply to damage due to abuse or misuse.

b. A refrigerator shall be considered inoperative within the meaning of above paragraph when interior cabinet temperature rises above 55 degrees F. and is maintained at such temperature for 6 or more consecutive hours after the usual normal adjustments have been made, or other mechanical trouble affecting normal operations has been corrected.

6. COOLING UNIT REPLACEMENT

a. The contractor shall furnish new or reconditioned cooling system units, replacing in refrigerators furnished under this contract any units which become defective (excluding damage due to visible abuse), during a four-year period, commencing at the expiration of the one-year guarantee period. The contractor shall provide the labor and materials required to make the exchanges. Defective units become the property of the contractor.

b. The contractor shall submit to the Contracting Officer THE NAME AND ADDRESS OF THE AGENT WHO WILL FURNISH SERVICE in connection with the guarantee and unit replacement as herein specified.

7. AFFIDAVIT. An affidavit shall be sumitted to the Contracting Officer certifying that the gas refrigerators furnished under the contract conform to the requirements stated in this specification.

DIVISION DHS 19

RANGES, ELECTRIC

NOTES TO THE ARCHITECT OR ENGINEER:

THIS SHEET IS FOR USE OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS SPECIFICATION MAY BE USED AS A PART OF THE GENERAL CONTRACT SPECIFITION OR IN CONNECTION WITH A SEPARATE CONTRACT FOR PURCHASE OF ELECTRIC RANGES.

CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES DEFINING NUMBER OF RANGES REQUIRED. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

DIVISION DHS 19

RANGES, ELECTRIC

1. SCOPE

Includes the furnishing and delivering of _____ electric ranges as hereinafter specified.

2. DESCRIPTION

a. Type. Three surface units (open cooking top) with oven and broiler below fitted with one burner.

b. Capacity. Not more than 9 KW.

c. Operating Service. 120/240 volts, 60 cycle, 3 wire.

d. Overall dimensions - not more than 23 inches wide, 28 inches deep, 36 inches from floor to cooking top and 42 inches from floor to top of back splasher.

e. Federal Restrictions. Amount of critical material used in construction shall not exceed limits established by Federal Agencies having control over such limitations.

f. Applicable Specifications. Ranges shall conform to Federal Specifications W-R-101 dated March 26, 1942, Style C.

(1) Range shall be suitable for operation when placed within 1 inch of adjacent walls and cabinets.

3. DELIVERY

The electric ranges shall be delivered to the project, free from damage and blemishes. After connections are made as required under the division INTERIOR ELECTRICAL WIRING, place in operation and check for proper performance, certifying to the contracting officer that the equipment has been tested in place and found satisfactory. Energy required for testing shall be supplied at Government's expense.

4. INSTRUCTIONS

a. Furnish the following replacement lists and operating instructions to the contracting officer.

(1) Operating - Furnish printed sets of operating and maintenance instructions in or attached to each range and spare sets amounting to 10% of the total number of ranges.

(2) Replacement parts list - minimum number of five printed sets.

5. GUARANTEE

The contractor shall guarantee the electric ranges to be free from defects in design, workmanship and materials and agree to repair, replace and install, free of charge, any part, except vitreous enamel, proving defective within one year from day of acceptance by the Government. THE NAME AND ADDRESS OF AGENT WHO WILL FURNISH SERVICE under the guarantee shall be submitted to the contracting officer.

6. AFFIDAVIT

An affidavit shall be submitted to the contracting officer certifying that the electric ranges furnished under the contract conform to the requirements stated in this specification.

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DIVISION DHS 19a

RANGES, GAS

NOTES TO THE ARCHITECT OR ENGINEER:

THIS SHEET IS FOR THE USE OF THE ARCHITECT OR ENGINEER ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

THIS SPECIFICATION MAY BE USED AS A PART OF THE GENERAL CONTRACT SPECIFICATION OR IN CONNECTION WITH A SEPARATE CONTRACT FOR PURCHASE OF GAS RANGES.

CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY. FILL IN BLANK SPACES DEFINING THE NUMBER OF RANGES REQUIRED, AND THE TYPE OF GAS TO BE AVAILABLE AT THE PROJECT. DO NOT, HOWEVER, MAKE CHANGES WHICH AFFECT THE FUNDAMENTAL DESIGN.

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DIVISION DHS 19a

RANGES, GAS

1. SCOPE

Include furnishing and delivering _____gas ranges as herein specified.

2. DESCRIPTION

a. Type. Four surface units (open cooking top) with oven and broiler below, insulated, AGA Type "B".

b. Operating Service. _____gas, _____ Btu per Cu. Ft.

c. Overall Dimensions. Not more than 22 inches wide, 25 inches deep (excluding handles and flue collar) and 36 inches from floor to cooking top.

d. Federal Restrictions. Amount of critical material used in construction shall not exceed limits established by Federal agencies having control over such limitations.

e. Applicable Specifications. Ranges shall conform to the American Standard Approval Requirements for Domestic Gas Ranges, (ASA Z21.1 - 1948 and addenda ASA Z21.1a - 1949 dated effective January 1, 1950), and meet the following requirements:

(1) Oven burner adjustments shall be made from front or side.

(2) Removable drip tray and broiler pan shall be included.

(3) Back splasher shall be approximately 4 inches high, full width of range.

(4) Oven size shall be approximately 16 inches wide, 12 inches high, 18 inches deep (tolerance plus or minus 5%).

(5) Oven vent shall discharge away from rear wall.

(6) Metal finishes - exposed faces of splasher back, manifold shield, front panel frame, door panel or panels and sides: white or ivory vitreous enamel. Cooking top - vitreous enamel. Drip tray - vitreous enamel or synthetic baked-on enamel. (except top), broiler interior, and broiler pan - vitreous enamel. Exposed faces of legs - vitreous enamel or synthetic baked-on enamel. Range back - black synthetic baked-on enamel.

3. DELIVERY

The gas ranges shall be delivered to the project, free from damage and blemishes. After connections are made as required under division PLUMBING, place in operation and check for proper performance, certifying to the contracting officer that the equipment has been tested in place and found satisfactory. Fuel required for testing shall be supplied at the Government's expense.

4. INSTRUCTIONS

a. Furnish the following replacement lists and operating instructions to the contracting officer.

(1) Operating - Furnish printed sets of operating and maintenance instructions in or attached to each range and spare sets amounting to 10% of the total number of ranges.

(2) Replacement parts list - minimum number of five printed sets.

5. GUARANTEE

The contractor shall guarantee the gas range to be free from defects in design, workmanship and materials and agree to repair, replace and install, free of charge, any part, except vitreous enamel, proving defective within one year from day of acceptance by the Government. THE NAME AND ADDRESS OF AGENT WHO WILL FURNISH SERVICE under the guarantee shall be submitted to the contracting officer.

6. AFFIDAVIT

An affidavit shall be submitted to the contracting officer certifying that the gas ranges furnished under the contract conform to the requirements stated in this specification.

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DIVISION DHS 20

TRAILER MOUNTING AND SERVICING

NOTES TO THE ARCHITECT:

THIS SHEET IS FOR THE INFORMATION OF THE ARCHITECT ONLY. DO NOT INCLUDE IN PROJECT SPECIFICATIONS.

SECTION 2. GENERAL

a. THE TRANSPORTATION CONTRACTOR WILL BE REQUIRED TO DELIVER THE TRAILERS TO THE SITE. IT IS INTENDED THAT THE SITE CONTRACTOR ARRANGE WITH THE TRANSPORTATION CONTRACTOR EITHER THAT, UPON DELIVERY AT THE SITE, THE TRAILERS BE "SPOTTED" AT DESTINED LOCATIONS ON THE SITE OR THAT THEY BE DELIVERED TO A STORAGE LOCATION, DEPENDING UPON THE PROGRESS OF THE SITE PREPARATION WORK OR ON SITE CONDITIONS.

SECTION 3. WOOD TRESTLES. OBTAIN FROM THE CONTRACTING OFFICER INFORMATION FOR DESIGN OF THE TRESTLES TO BE FABRICATED BY THE SITE CONTRACTOR IN EVENT THEY ARE NOT DELIVERED WITH THE TRAILERS. THE TRESTLE DESIGN IS ALSO NEEDED FOR MOUNTING THE TRAILERS AND SHOULD BE SHOWN ON THE DRAWINGS.

SECTION 4. TRAILER MOUNTING. OBTAIN FROM THE CONTRACTING OFFICER INFORMATION ON TRAILER WEIGHTS. IF THE BEARING CAPACITY OF THE EARTH BELOW THE TOPSOIL IS LESS THAN 2000 POUNDS PER SQUARE FOOT, THE DESIGN SHOULD PROVIDE TWO INCH PLANKING LAID FLAT, UNDER AND AT RIGHT ANGLES TO THE TRESTLE PLATE. SHOW CLEARLY ON THE DRAWINGS THE ADDITIONAL WORK REQUIRED.

THIS SPECIFICATION MUST BE ADAPTED TO SITE CONDITIONS. CHANGE AS NECESSARY TO MEET PROJECT REQUIREMENTS. STRIKE OUT ITEMS NOT APPLICABLE AND ADD AS NECESSARY.

DIVISION DHS 20

TRAILER MOUNTING AND SERVICING

1. SCOPE

a. Receive, receipt for, and be responsible for trailers upon delivery and after delivery until the contract is completed.

b. Position, mount on trestles and service trailers as specified herein.

c. Connecting the water and sewer and the electrical services to the trailer interior systems is specified in the divisions UTILITIES and ELECTRICAL DISTRIBUTION, respectively.

2. GENERAL

a. Trailers will be delivered to the site or in the vicinity thereof. The contractor shall receive the trailers and shall arrange with the transporting contractor for their disposition.

b. A list of interior furnishings, furniture, fittings and equipment will be furnished to the contractor who shall check each trailer for the inclusion of these items and report in writing to the Contracting Officer the results of the check. In general, equipment will include the following major items:

(1) Liquefied petroleum gas range

(2) Electric refrigerator

(3) Oil-fired space heater

(4) Electric water heater

(5) Wood trestles to support trailer above ground. If not included in the trailer, the contractor may be required by the Contracting Officer to furnish them as provided hereinafter.

3. WOOD TRESTLES

a. Furnish and fabricate two wood trestles for each trailer when required by the Contracting Officer. When trestles are furnished the Contract Price will be adjusted.

NOTE: These pages 20-1 and 20-2 supersede pages 20-1 and 20-2 of Division DHS 20 dated 2-1-52. Material * between asterisks * is new or revised. Page 20-1 has been rerun without change.

b. Lumber shall be 100% heart fir, redwood, oak, cedar, chestnut locust, untreated, or any wood equivalent to No. 2 common fir which has been dipped after the parts are cut for five minutes in a 5% solution of pentachlorophenol or equivalent.

c. Rigidly nail together as shown on the drawings.

4. TRAILER MOUNTING

a. Excavate below topsoil evenly to grades as directed by the contracting officer to obtain firm soil bearing for trailer supports. Level up and thoroughly compact bottom of excavation. Install wood planking where and as shown or specified. If additional wood planking is required, the contract price will be adjusted.

b. Install trestles in proper position levelling and blocking as necessary to level up the trailer. Mount trailer on trestles and secure in position, wedging and blocking as necessary. Backfill around trestles to eliminate drainage "pocket".

*c. Remove wheels as directed in accordance with manufacturer's recommendations and store them under trailers in racks provided by the trailer manufacturer.

5. TRAILER SERVICING

a. Unpack all loose items within the trailer.

b. Inspect, test and service the equipment furnished as part of the trailer and submit written report in triplicate to the contracting officer of any deficiences noted. Demonstrate in presence of the contracting officer's representative the proper functioning of the equipment as follows:

(1) Drainage System: Test for tightness by subjecting to air or chemical test of at least one inch of water column.

(2) Liquefied Petroleum Gas Range: Furnish liquefied petroleum gas necessary for this operation, inspect for leakage, tighten connections where necessary, operate the burners and adjust to proper operation.

(3) Electric Refrigerator: Operate sufficiently to satisfy the contracting officer as to its proper functioning.

(4) Oil-fired Space Heaters: Provide oil necessary for test, inspect for leakage, tighten connections where necessary; light and adjust to proper operation, check electrical equipment for operation and test for short circuits and grounds.

(5) Electric Water Heater: Inspect for water leakage and test for electrical short circuits and grounds; operate sufficiently to satisfy the Contracting Officer of its proper functioning.

(6) Electrical Equipment not in above items: Inspect for proper operation and test for short circuits and grounds.

c. Remove all rubbish and leave trailer clean.

d. Deliver keys to Contracting Officer after locking doors.

BULLETIN NO. DH-2
SUPPLEMENT NO. 1

SUPPLEMENT NO. 1 TO
SPECIFICATIONS

for

TRAILER PROJECTS

and for

TEMPORARY PROJECTS

SECOND EDITION
REVISED AUGUST 1952

DEFENSE HOUSING BULLETIN

[To Be Attached to Specifications For Trailer And Temporary Projects
Second Edition, Revised August 1952]

PUBLIC HOUSING ADMINISTRATION
HOUSING AND HOME FINANCE AGENCY
WASHINGTON 25, D. C.

OCTOBER 1952

TEMPORARY PROJECTS - DHT SERIES 1 REVISED

This Supplement No. 1 to Specifications for Trailer Projects and for Temporary Projects, Second Edition, as Revised August 1952, covers changes in the plans for DHT Series 1 Rev. dated 7/28/52 as indicated on drawings entitled DHT-Series 1 Rev. dated 10/2/52 and revised 10/20/52; some changes in materials; the addition of some materials, and some further corrections to the original issue of Bulletin No. DH-2 dated February 1952, which were not covered in the issue of August 1952.

Changes in materials are summarized briefly below:

1. Alternate for wood foundation posts omitted.
2. Skirting to be 3/16" tempered hardboard and skirting to be mandatory.
3. Requirements for flooring to be raised.
4. Kitchen cabinets to be factory made, wood or metal.
5. Bathroom and kitchen walls to have enameled wallboard overlay in part.
6. Windows to be residential type metal casements.
7. Gutter added over entrance.
8. Paint chimney above roof and oil drum same as exterior walls.
9. Add toilet fixtures in laundry buildings.
10. Some changes in water heater capacities in the laundry and addition of connections for automatic washers and dryers.
11. Walks to be concrete.
12. Better door hardware.
13. Kitchen fan to be mandatory.
14. Noncombustible partition back of space heater.
15. Curtain track between bedroom No. 3 and the living room.

The following pages show necessary changes in the detail specifications and the pink NOTES TO THE ARCHITECT to amend Bulletin No. DH-2 Second Edition, Revised August 1952, to cover the changes heretofore mentioned.

DIVISION DHS-1, CLEARING, EXCAVATING, FILLING AND GRADING
No change.

DIVISION DHS-2, CONCRETE AND MASONRY
Section 1, SCOPE
1. Omit reference to wood piers.

DIVISION DHS-3, CARPENTRY AND MILLWORK
Pages 3-i and 3-ii, NOTES TO THE ARCHITECT
1. Omit references to wood foundation posts and double hung stock windows. It is economical to use one kind of window throughout. Specifications for metal casement windows are included hereinafter.
2. Omit reference to weatherstrips.

Section 1, SCOPE

1. To omit reference to weatherstrips for windows, change subsection a to read as follows:

a. Storm sash combination doors and weatherstrips for sides and heads of exterior doors shall be furnished only when specifically required in the General Scope of Work.

Section 2, MATERIALS

1. Since cabinets are to be factory made and will be specified as hardwood, change subsection c, to read as follows:

c. Exterior and interior frames, trim and millwork (not cabinets) shall be fabricated from any of the following:

Fir	Douglas WCL Rules	D Finish
Pine	Ponderosa	D Select

2. Since windows are to be metal, subsection e, referring to wood windows, shall be omitted and a new subsection e covering metal windows substituted as follows:

e. Windows shall be metal windows of sizes and types indicated on the drawings. The contractor shall have the option of furnishing aluminum or galvanized steel windows unpainted or steel windows prime painted at the factory and finish painted as specified in Division 8, PAINTING AND GLAZING. Stock commercial windows and screens will be accepted including hardware and standard sections providing they conform to requirements specified herein and substantially to details indicated on the drawings. Transom windows shall be manufacturer's standard basement windows opening in at the top. Side hinged windows shall be residence casement windows.

(1) Steel casements. The principal members of frames and ventilators shall be hot rolled new billet steel Z bars not less than one inch deep and 1/8 inch thick. Screws, bolts and clips shall be rustproofed steel.

(a) Corners of frames and ventilators shall be welded and welds smoothed. Muntins shall be continuous with flush interior surfaces, shall be mortised and tenoned to frames and securely peened. Side hinged ventilators shall open out. Members shall be arranged for outside glazing and punched for glazing clips.

(b) Drip molds projecting not less than 5/8 inch, of not less than 18 gage metal, shall be provided at heads of ventilators.

(c) Hinges of side hinged ventilators shall be the cleaning type riveted or welded to frames. Hinge pins shall be rustproofed steel or high strength bronze.

(d) Operation of side hinged ventilators shall be by roto type under screen operators.

(e) Weathering contacts shall be double and continuous around ventilators. When ventilators are adjusted and locked, contact shall be such that a 1/32 inch gage cannot be inserted between frames and ventilators at any point without forcing.

(f) Hardware. Side hinged ventilators shall be equipped with die cast, solid bronze, malleable iron or rustproofed pressed steel locking handles to effect secure closing of the windows. Transom windows shall have manufacturer's standard push bar hardware. Hardware shall be installed at the site or the panels so crated as to prevent damage to the hardware.

(g) Screens. Unless otherwise specified, all ventilators shall be screened. Screens shall effectively bar the passage of insects through the openings screened, be easily removable and interchangeable with screens of the same nominal size and with storm windows and include necessary hardware for secure attachment.

Frame members of screens shall be of not less than .032 inches thick, galvanized steel with mitred corners and not less than 5/32 inch splines. Edges shall be rounded so as not to cut the screen cloth. Screens shall be easily rewirable.

(h) Shop coat. Steel windows and screen frames shall receive a hot dip phosphate or a cold phosphate chromate treatment. Immediately after drying, apply a shop coat of a rust inhibitive paint which will produce a hard tough film of good appearance, flexibility, adhesion and rust resistance. Shop coat shall be oven dried.

(i) Galvanized windows. Windows shall be cleaned free of dirt, oil, rust, paint and oxide, pickled in an acid bath, rinsed free of acid, dried and then immersed in a bath of melted zinc at a temperature of 850°F. to 875°F. The windows shall remain immersed until the temperature of the steel equals the temperature of the bath and then slowly withdrawn. The zinc coating shall be uniform, free from cracks, pinholes and bare spots and shall adhere firmly to the steel. Inspection shall be visual but when visual inspection is not conclusive, a window or a part thereof shall withstand five one minute dips of the Preece test (ASTM A-239). Treat windows after galvanizing with a hot phosphate or a cold phosphate chromate treatment to provide a bond for putty.

(j) Install windows accurately in frames without distortion. Install hardware and adjust ventilators to operate freely and to close within the limits specified.

(2) Aluminum windows shall be residential type casement windows with roto type operators and shall conform to the current edition of the specifications of the Aluminum Window Manufacturers Association, 74 Trinity Place, New York 6, New York. Ventilators shall be provided with screens conforming to the above referenced specifications.

3. When storm sash are specified, the following specification should be added:

(3) Storm windows consisting of metal frames and rubber compression gaskets, manufacturer's standard type, attached to metal windows with screws, glazed with double strength B glass, shall be provided for all metal windows. Metal frames shall be aluminum or galvanized steel unpainted or black steel treated and painted as specified for black steel windows. Storm sash shall have ventilating panels at least one in each bedroom and two in the living room unless otherwise indicated on the drawings.

4. To improve the quality of the flooring, replace subsection g with the following:

g. Flooring shall be strips not less than 25/32 inch thick and not over 3-1/4 inches wide, side matched, of any of the following:

Oak	No. 1 Common
Pecan, maple, birch and beech	Third Grade
Douglas fir WPA Rules	C Select VG
Douglas fir WCL Rules	C VG
Southern pine	B VG

Better grades to avoid waste of short lengths are optional with the contractor. Only one species shall be used in one building. Hardwood flooring shall be end matched. Filler strips shall be the same species and equal to the flooring. Factory finished flooring meeting requirements specified above may be used. Flooring shall be kiln dried to and maintained at a moisture content of 8 to 12 percent. Flooring shall be sorted before laying as specified hereinafter.

(1) Flooring in bathrooms shall be Douglas fir plywood 3/4 inch thick, interior type, Grade C-D, covered with asphalt tile. (See Division ASPHALT TILE.)

(2) Porch flooring and exterior steps and stringers shall be 100 percent heart of Douglas fir, western larch, southern pine, cypress or redwood.

5. Subsection h, Exterior Wall Covering. In the fourth line, change Grade B-C to Grade A-C.

6. Subsection i, Interior Wall and Ceiling Board calls for a hardboard with a lower modulus of rupture than Federal Specification LLL-F-311, Class A, hardboard. The modulus of rupture for 1/4 inch board should be 4100 psi instead of 4700 psi as shown in subsection i, and compares with 6000 psi for Class A hard pressed fiberboard.

To provide for the use of an enameled wallboard on part of bathroom and kitchen walls and correction as above, change subsection i to read as follows:

1. Interior wall and ceiling board, except as hereinafter specified for bathroom walls, shall be one of the following:

Hard pressed fiberboard conforming to Federal Specification LLL-F-311, Glass A, 1/4 inch thick, except that the requirement for modulus of rupture shall be 4100 psi, or composition wallboard conforming to Federal Specification UU-W-101a, .340 inches thick minimum, waterproofed, prefinished with an ivory colored synthetic coating at the factory or sized ready for paint and meeting the following limitations:

Linear expansion when tested in accordance with the method described in Federal Specification LLL-F-311b shall be

Crosswise of Panel	.1% maximum
Lengthwise of Panel	.05% maximum

The moisture content shall be 6% to 12% by weight and the water absorption after 24 hours in water at 70° F. shall be 15% maximum by weight.

When composition wallboard, as above specified, is used the bathroom walls shall be covered with the same material. When hard pressed fiberboard, as specified above, is used generally, the bathroom walls shall be covered with Class B (tempered) hard pressed fiberboard 1/4 inch thick.

Only one kind of wallboard shall be used in a building except as hereinafter specified for kitchen and bathroom walls.

Kitchen walls and bathroom walls, where indicated on the drawings, shall have an overlay of enameled hardboard, manufacturer's standard color as selected by the Contracting Officer, applied over the wallboard. Enamelled hardboard shall be hard pressed fiberboard 1/8 inch thick, conforming to Federal Specification LLL-F-311, Class B, finished at the factory with a synthetic urea alkyd finish permanently integrated to the base material by baking. The finish shall be a uniform semi-gloss. Enameled hardboard shall be furnished in the largest practicable sizes with smooth uniform surfaces (not grooved to imitate tile).

Edges and joints of enameled hardboard shall be protected by moldings of the type and pattern indicated on the drawings. Moldings over panel junctions shall be enameled strips 5/16 inch thick of the same material, color and finish as the enameled hardboard. Other moldings shall be manufacturers standard aluminum molding, colored to match the enameled wallboard. Provide curved sections to fit the edges of bathtub. Adhesive for attaching enameled hardboard shall be a waterproof, rubber base adhesive recommended by the manufacturer of the hardboard. Attach moldings over panel joints with chrome plated oval head screws 3 inches on center.

Section 3, WOOD PRESERVATIVE TREATMENT

1. To prolong the life of sills of laundry buildings and to omit references to wood sash, the section should read as follows:

Door frames and doors in exterior walls, wood porch posts and wood window frames shall be preservative treated and bear the Seal of Approval of the National Woodwork Association or be accompanied by an affidavit from the manufacturer certifying that they have been fabricated from all heart lumber or have been treated in accordance with the Minimum Standards established by the National Woodwork Association. Brush coat cut surfaces with a 5 percent solution of the same preservative.

Lumber for plates, aligners, blocking and any other woodwork in contact with concrete floor in laundry buildings shall be all heart lumber or shall be submerged for ten minutes in a 5 percent solution of the same preservative.

Section 5, WOOD FOUNDATIONS

1. In order that buildings may be provided with better anchorage, concrete foundations shall be installed on all projects and all reference to wood foundations deleted; consequently, omit Section 5 entirely.

Section 6, FABRICATION

1. To clarify the specifications, omit the last sentence of subsection b and substitute the following:

Millwork and trim shall be sanded smooth on surfaces and edges with the sharp edges of corners sanded off. Surfaces shall be true and straight, free from torn grain and other defects that impair their appearance and serviceability.

2. The wood molding formerly specified at the top and ends of the bathtub has been replaced by a metal molding and the interior finish of the bathroom has been revised; therefore, subsection c,(3) shall read as follows:

(3) Provide solid blocking around three sides of the bathtub at the level of the top of the tub and down to the floor at the ends of the tub to provide support for the wallboard finish and the metal molding at the top and ends of the bathtub.

3. Because the width of windows has been reduced, horizontal joints in the exterior siding and interior wallboard will be difficult to avoid; therefore, Section 6, subsection c, shall contain an additional paragraph stating the following:

(3) Avoid horizontal joints in siding and interior wallboard except at window sills and heads. All horizontal joints shall be made over solid blocking and a Z shaped metal flashing inserted in the horizontal joints in siding to shed rain water.

4. To provide for the erection of the enameled wallboard in kitchen and bathroom, the following paragraphs should be added to subsection g.

Enameled wallboard shall be unpacked, seasoned and sprinkled as recommended by the manufacturer of the board. Wallboard to which the enameled wallboard is to be applied shall be straight, true, plumb, clean, wall fastened to studs and dry.

Adhesive shall be evenly applied to the back of the enameled wallboard with a toothed trowel at the rate of 60 square feet per gallon. Moldings and wallboard shall be applied to the walls in strict accordance with the printed instructions of the manufacturer of the wallboard. Calk between edges of moldings and bathtub and under moldings at interior corners with a white waterproof cement. At completion, the enameled wallboard shall be flat, true, solidly glued to the backing at all points and free from defects in material and workmanship. Joints in work above the tub shall be watertight.

5. To improve the quality of the flooring, Section 6, subsection i, shall read as follows:

i. Flooring shall be sorted or cut before laying to exclude any of the following defects: voids on finished edges, rot, knotholes over 3/8" in diameter, unsound knots, shakes, heart checks, split ends that cannot be drawn tight, torn grain and defects which will not sand smooth. After application of floor insulation, lay flooring perpendicular to joists with joints close. Strips of flooring shall bear on at least two joists. Blind nail with 8d flooring nails to each joist. Joints in soft wood flooring shall occur over joists only. Stagger ends of hardwood flooring so that ends in any joist space are separated by at least one through strip. Stagger ends of soft wood flooring on alternate joists.

(1) Sand floors parallel to grain until smooth, finishing with fine paper.

(2) Provide oak thresholds where shown.

6. To delete all references to wood sash, screens and storm sash from this specification and to correct clearances for doors omit subsection k beginning with "Doors sash, screens and storm sash" and substitute the following:

k. Doors shall be fitted to frames at the factory complete with hardware attached. Clearances at top and sides of doors shall be 1/8 inch, 3/16 inch at bottom over threshold and 3/4 inch at bottom from floors. Remove door knobs and any other hardware projecting more than one inch from the surface, tag for identification and ship boxed with similar items. Apply dunnage strips to panels as necessary to protect frames, trim, wallboard and hardware from damage in handling and shipment.

7. To eliminate reference to cabinets from subsection 1, omit subsection 1 entirely and substitute the following:

1. Closets, shelving, storage racks, counters, ironing boards and miscellaneous millwork items shall be fabricated from sound dry lumber with members not less than 3/4" thick, except as otherwise shown or specified, and wide enough to insure sturdy rigid construction.

(1) Details of construction shall be as indicated on the drawings. Closets shall be nailed and glued.

(2) Shelves shall be solid stock not less than 3/4 inch thick. Support shelves on cleats securely fastened to adjacent construction.

(3) Doors shall be 5-ply plywood or hard pressed fiberboard not less than 1/2 inch thick, edge lap type, or paneled with solid stiles and rails with plywood panels.

(4) Drawer fronts shall be straight grained stock 3/4 inch thick. Partition one drawer for cash pockets.

(5) Laundry work tables shall be made of 1 x 6 inch boards on 2 x 4 supports. Cover tops of tables with 3/16 inch hard pressed tempered fiberboard or 1/4 inch plywood, interior type, Grade B-D.

(6) Ironing boards shall be one piece wood or stock expanded metal boards of size indicated on the drawings, fastened securely to the laundry table with screws or stove bolts.

8. To provide for factory built kitchen cabinets, include the following subsection o:

o. Kitchen base and wall cabinets shall be factory made cabinets of wood or metal, meeting good practice standards of the trade and substantially meeting these specifications. Dimensions shall be approximately as indicated on the drawings but minor adjustments to meet manufacturer's standards will be accepted provided such changed dimensions do not interfere with other furniture or equipment. Shop drawings shall be furnished for kitchen cabinets and approval of the Contracting Officer obtained before fabrication.

(1) Wood cabinets shall be constructed of hardwood unless otherwise specified of a minimum thickness of 5/8" for primary members and 3/8" for drawer backs and bottoms. Base cabinet tops and splash boards shall be 1/16" thick Consoweld or Micarta or approved equal manufacturer's standard color as selected by the Contracting Officer, factory bonded to 3/4" waterproof fir plywood with a backing layer of similar plastic bonded to the underside of the plywood. The sinks shall be mounted flush with the top. All edges of base

cabinet tops and splash boards shall be protected with stainless steel moldings set in waterproof cement. Completed cabinet top and sink assembly shall be watertight. Doors shall be 1/2" plywood or hard pressed fiberboard with lapped edges. 1/4" plywood may be used for tops and backs of wall cabinets and backs of base cabinets. Vertical members shall be rabbeted to receive horizontal members. All joints shall be nailed and glued.

(a) Hardware consisting of hinges, catches and door and drawer pulls of matching pattern, chrome plated, shall be provided and attached at the factory.

(b) Wood cabinet work shall be sanded smooth and finished with a prime coat and manufacturer's standard white enamel.

(2) Metal cabinets shall be of furniture steel not less than 22 gage except that backs and door backs may be 24 gage primed with rust inhibitive paint finished on interior and exterior with two coats of enamel separately baked on. Cabinets shall be factory assembled, complete with hardware. Color shall be white. Hardware shall be similar to that specified for wood cabinets.

(a) Base cabinet tops and splash boards shall be as specified above for wood cabinets.

(b) Doors shall be hollow and filled with sound deadening fiberboard.

(c) Assembly shall be by means of spot or projection welding. Exterior surfaces shall be smooth.

Section 8, ERECTION

1. Since cabinets will be factory made, subsection n should read as follows:

n. Office counters shall be constructed in accordance with the specifications for closets and shelving and as follows: (including existing subsections (1), (2), (3) and (4).)

2. Since the application of weatherstrip to metal casement sash is not necessary, change subsection s to read as follows:

s. Weatherstrips for entrance doors shall be spring bronze or stainless steel strips not less than .01 inch thick, manufacturer's standard type providing a weathertight seal on all edges of the doors. They shall adjust themselves to the swelling and shrinking of the doors without impairing their efficiency. Use copper or brass nails or screws for attaching bronze strips and cadmium plated or stainless steel for attaching stainless steel strips.

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3. To provide for the mandatory use of skirting and to change the skirting to 3/16" tempered hardboard, change subsection t to read as follows:

t. Skirting shall be 3/16" hard pressed fiberboard conforming to Federal Specification LLL-F-311, Class B. Nail to framing with galvanized 3d or 4d nails, four inches on center.

4. To eliminate the wood molding around the bathtub and to provide a curtain track on ceiling between the 3rd bedroom and the living room, change subsection u to read as follows, and add a new subsection v, as follows:

u. Curtain track on ceiling shall be a stock metal molding similar to Kirsch No. 9035, finished with chrome, or bronze plate, or baked enamel. Curtain carriers shall be brass or nylon similar to Kirsch No. 9405 or No. 9406, spaced not over six inches apart. Attach track to ceiling where indicated on the drawings not over one foot apart with wood screws penetrating joists not less than one inch. Avoid joints between panels.

v. Non-combustible partition shall be composed of three layers of 1/2" gypsum wallboard conforming to Federal Specification SS-W-51a, Type A, secured together to form a partition 1-1/2 inches thick by means of stove bolts and washers not over 18 inches apart or more than 3" from edges. Exterior layers shall be in one piece.

DIVISION DHS-4, THERMAL INSULATION
No change.

DIVISION DHS-5, ROOFING, COMPOSITION
1. To correct the roofing specifications to provide for the change of roof deck from fiberboard to wood, change subsection 3,j and section 4 to read as follows:

j. Roofing felt shall turn up not less than 4" against any curbs around chimneys or other vertical surfaces.

4. APPLICATION OF COMPOSITION ROOFING

a. Coal tar pitch or asphalt composition roofing shall be 3-ply applied as follows: (See GENERAL REQUIREMENTS in this Division.)

b. Lay strips of sheathing paper 12 inches wide over panel joints and nail in place with roofing nails through metal discs 12 inches on center along each edge.

c. Sheathing paper shall be laid over entire area of sheathing board (not plywood) roof decks under coal tar pitch roofs. Lap joints two inches and nail sufficiently to hold in place.

d. Apply one layer of 30 pound felt over the entire area lapping each ply four inches over the preceding ply and nail at laps sufficiently to hold in place.

e. Two plys of 15 pound felt shall then be laid over the base felt lapping each ply 19 inches over the preceding ply, mopping with 25 pounds of bitumen per square over the base felt and between plys so that in no place shall felt touch felt. Nail each ply at from two to four inches from the upper edge with roofing nails through metal discs not over 12 inches apart.

f. Coat the surface with a uniform poured coat of 75 pounds of bitumen into which, while hot, embed 300 pounds of slag or 400 pounds of gravel per square.

DIVISION DHS-5a, ROOFING, SHINGLES
No change.

DIVISION DHS-5b, SHEET METAL WORK
1. To provide gutter and downspout at front door as indicated on the drawings, add the following subsection e to Section 4, INSTALLATION:

e. Gutters and downspouts shall be not less than 28 gage galvanized steel of sizes and details as indicated on the drawings. Provide elbow at bottom of downspout.

DIVISION DHS-6, BUILDERS HARDWARE
1. The references to balances for double hung windows in subsection a of SCOPE should be removed since double hung windows are not used.

2. Section 7, LOCKS
It is intended to omit tubular locks from the specifications and to prohibit the use of die cast parts. To accomplish this end, subsections d and e should read as follows:

d. Mortise or cylindrical locks and latches shall be used. Lock sets shall be complete with escutcheons, knobs, roses and similar items as required and specified. Where two numbers are given under any one type of lock both items shall be provided.

e. Lock Schedule	Mortise Locks
Front and rear doors keyed alike	194 - 185
Bedroom doors	3 D
Bathroom doors	3 B
Storage doors and other doors not otherwise specified	194 - 185

Series 160 cylindrical case locks and latch sets may be furnished in lieu of mortise lock and latch sets described herein when they provide substantially the same performance in operation and control and have substantially the same quality of construction and wrought trim as the mortise lock and latch sets for which they are substitutes.

Bathroom locks shall have an emergency access device and the locking mechanism shall release when the knob is turned or when the door is closed. The emergency lock shall be operable by an emergency key or by straight tools such as a knife blade, a small file or a nail.

The use of die cast parts in any lock is not permitted.

Section 8, SHELF AND MISCELLANEOUS
1. Since cabinets C-5, C-6, C-7 and C-8 are not included and all other cabinets will be factory made and include necessary hardware, and since wood sash, wood screens and wood storm sash are no longer part of the work, reference to hardware for those items should be omitted. Specifically, the following subsections should be omitted: d, e, f, j, k and l.

DIVISION DHS-7 ASPHALT TILE
No change.

DIVISION DHS 8, PAINTING AND GLAZING
1. To provide for the elimination of wood sash, wood screens and wood storm sash, and for painting of chimneys and interior metal and piping, the following changes should be made in the specifications:

Section 4, GENERAL REQUIREMENTS
Omit subsection f.

Section 6, EXTERIOR PAINTING
Change subsection a to read as follows:

a. Exterior woodwork and exterior covering, including both sides of combination and screen doors, shall be painted as follows:

First coat exterior primer	TT-P-25	
Second coat exterior oil paint	TT-P-102,	Class A for white paint and Class B for tinted paint.

Both first and second coats shall be manufactured especially for two coat work. Spread at a rate of not to exceed 450 square feet per gallon for the first coat and 550 square feet per gallon for the second coat.

2. Change subsection b to read as follows:

b. Exterior metal including metal chimney and oil drum shall be painted as follows:

First coat on ferrous metal, red lead	TT-P-86a
First coat on galvanized metal, zinc dust-zinc oxide	TT-P-641
First coat on aluminum	Zinc chromate paint
First coat on asphaltic shop coats	Aluminum paint
Second coat exterior oil paint	TT-P-102

Section 7, INTERIOR PAINTING

1. Change subsection a to read as follows:

a. Interior doors, interior of exterior doors, trim not otherwise specified, and bathroom walls and ceilings, not covered with enameled wallboard, shall be painted as follows:

First coat (not wood sash) primer-sealer	TT-P-56a
Second coat enamel undercoat	TT-E-543
Third coat semi-gloss enamel	TT-E-508

2. Change subsection b to read as follows:

b. Walls and ceilings, except for prefinished wallboard on walls and except bathrooms and walls covered with enameled wallboard shall be painted as follows:

One coat resin emulsion	TT-P-88a

Prefinished wallboard which has become soiled shall be cleaned or painted as for unfinished wallboard.

3. To provide for painting of interior metal add the following new subsection f.

f. Interior metal including sash,(except aluminum or galvanized sash) fire protection guards, piping and pipe covering shall be painted as follows:

First coat on sash	Manufacturer's shop coat
First coat on galvanized steel, zinc dust-zinc oxide	TT-P-641
First coat on piping, zinc dust-zinc oxide	TT-P-641
First coat on pipe covering	TT-P-56a

Second coat on all items - same as finish coat on adjoining surfaces.

Section 10, GLAZING

1. To provide for the change from wood to metal sash, change subsections c and e to read as follows:

c. Putty and Glazing Compound

(1) For wood doors shall be a white lead-whiting putty containing not less than 10 percent of white lead by weight.

(2) Putty for steel windows shall conform to Federal Specification TT-P-781a, Type II. Putty used with galvanized windows shall match the color of the windows.

(3) Glazing compound for aluminum windows shall conform to Federal Specification 77-P-781a, Type I, shall be specially prepared for this purpose, shall adhere tightly to the surface, remain plastic, shall not require painting and shall match the aluminum for color reasonably well. The compound shall have been in satisfactory use for at least two years. The contractor shall furnish the names of two buildings where it has been used as near as practicable to the project site. Approval of the Contracting Officer shall be obtained before using the compound. The word "putty" when used in the following subsection e, shall apply to either putty or glazing compound, as applicable.

e. Glazing. Surfaces shall be dry and free from dust or ice before glazing. Dirty surfaces shall be cleaned with a cloth saturated with turpentine or mineral spirits before glazing. Putty shall not be applied in temperatures below 40°F. or during damp or rainy weather. Do not glaze wood doors until they have received a priming coat of paint as specified. Do not handle windows after glazing until the putty has set. Obscure glass shall be set with smooth side out.

(1) Bed glass completely in putty. Set with glazing clips. Apply face putty with sufficient pressure on the knife to insure complete adhesion to glass and rabbet. Cut off excess immediately after glass is bedded. Face putty shall be full, smooth and with accurately formed bevels having clean cut miters.

(2) Putty shall be used as it comes from container without adulteration and only after thorough remixing. If thinning is required, use only white gasoline and not more than one tablespoon per gallon of putty.

(3) Doors shall have glass completely bedded in putty and set with glazing beads.

(4) Ventilate building after glazing by opening windows slightly top and bottom sufficient to prevent condensation of water on the glass and bed putty. Maintain such ventilation until glazing compound or putty has set.

DIVISION DHS-9, SHADES
No change.

DIVISION DHS-10, SUSPENDED CHIMNEYS
No change.

DIVISION DHS-11, PLUMBING
The following changes in the specifications are required to conform the existing specifications to the revised drawings.

Page 11-i NOTES TO THE ARCHITECT OR ENGINEER. Change the fourth paragraph to read as follows:

DOMESTIC WATER HEATERS SHOULD BE INCLUDED FOR LAUNDRIES AND OTHER SERVICE BUILDINGS. FOR LAUNDRIES, SIZES SHOULD BE NOT LESS THAN 15 GALLONS STORAGE AND 25 GALLONS RECOVERY PER HOUR (100°F. TEMPERATURE RISE) FOR EACH LAUNDRY TRAY AND EACH WASHING MACHINE; SPECIFICATIONS SHOULD BE PATTERNED AFTER THOSE INDICATED HEREIN FOR THE DWELLING UNITS, BUT SEPARATE STORAGE TANK AND HEATER MAY BE NECESSARY. FOR OTHER SERVICE BUILDINGS SIZES SHOULD BE BASED UPON THE NUMBER AND TYPE OF FIXTURES REQUIRING HOT WATER.

Section 2, MATERIALS
1. Change subsection b to read as follows:

b. Underground drainage piping for dwelling units shall be extra heavy or service weight cast iron soil pipe and fittings or standard weight galvanized steel or wrought iron pipe with cast iron drainage fittings. Turns, when using steel or wrought iron piping shall be made with long turn 90 or 45 degree elbows.

2. In subsection r (1) change "3/4 inch preshrunk" to "1/2 inch preshrunk."

Section 4, DRAINAGE LINES
1. Change the second sentence to read as follows:

Underground steel and wrought iron drainage piping and all pipes passing through or under corrosive material, such as cinders or cinder concrete, shall be protected with a heavy coat of coal tar enamel and wrapped as specified in the National Plumbing Code.

Section 6, TRAPS AND CLEANOUTS
1. Change the schedule under subsection c to read as follows:

Water Closet	3	inches	
Bathtub	1½	"	
Lavatory	1¼	"	
Kitchen sink	1½	"	
Kitchen sink and tray	1½	"	
Service sink	3	"	trap standard
Laundry tray	1½	"	
Floor drain	3	"	

Traps in dwelling units for the kitchen sink and kitchen sink and tray shall have 1-1/2" x 2" swivel threaded ell outlet.

Section 10, WATER SUPPLY
1. Change the schedule under subsection a to read as follows:

	Cold Water	Hot Water
Water Closet	3/8 inches	---
Bathtub	1/2 "	1/2 inches
Lavatory	3/8 "	3/8 "
Kitchen Sink	1/2 "	1/2 "
Kitchen Sink and Tray	1/2 "	1/2 "
Service Sink	1/2 "	1/2 "
Laundry Tray	1/2 "	1/2 "
Hose Bibb or Sillcock	1/2 "	---

Section 11, INSULATION
1. Change subsection a to read as follows:

a. Cold water piping in dwelling units exposed to view and located in storage and closet spaces and behind cooking range, except supplies furnished as part of the fixture trim, shall be covered with insulation as herein specified. Hot and cold water piping shall be covered with the respective materials specified herein, when located in the following spaces:

(1) Laundry

(2) _____

(3) _____

2. Change subsection e to read as follows:

e. Drainage line under floor from water closet to stack and bathtub trap and drainage line from bathtub to stack shall be covered, wrapped, secured in place and painted, same as specified above for the service water line. Nominal thickness of insulation shall be two inches.

Section 12, PLUMBING FIXTURES
1. Add a new subsection m as follows:

m. Service sinks shall be roll rim type, 12 inches deep, with integral back, supported by a 3 inch cast iron trap standard with cleanout and grid strainer and a metal wall hanger. The supply fitting shall be 1/2 inch combination rough plated type with lever handles and short mixing spout having a pail hook and hose end. Sinks shall be cast iron porcelain enameled with rough plated rim guard, nominal size 22" x 18".

DIVISION DHS-12, SPACE HEATERS - GAS
Section 2, DETAILED REQUIREMENTS
Omit subsection b,(1)

DIVISION DHS-12a, SPACE HEATERS - OIL
Section 2, DETAILED REQUIREMENTS
Omit subsection c,(4)

DIVISION DHS-12b, HEATING - FORCED WARM AIR
No change.

DIVISION DHS-12c, VENTILATING EQUIPMENT
Page 12c-i, NOTE TO THE ARCHITECT. Omit the second paragraph and substitute the following:

THIS DIVISION INCLUDES THE FOLLOWING ITEMS: (A) EVAPORATIVE COOLERS FOR USE IN HOT DRY CLIMATES, (B) WALL TYPE ELECTRIC VENTILATORS AND (C) CIRCULATING FANS TO IMPROVE HEAT DISTRIBUTION WHEN THE DESIGN TEMPERATURE IS MINUS 5°F AND LESS. ON THE BASIS OF HIS KNOWLEDGE OF CLIMATIC CONDITIONS FOR A SPECIFIC PROJECT THE ARCHITECT SHALL RECOMMEND TO THE PHA FIELD OFFICE THE INCLUSION OF ITEM A OR C TOGETHER WITH JUSTIFICATION THEREFOR AND SHALL NOT COMPLETE THE PLANS IN THIS RESPECT UNTIL HE HAS RECEIVED INSTRUCTIONS FROM THE PHA FIELD OFFICE. ITEM B IS MANDATORY IN ALL AREAS.

Section 3, WALL VENTILATORS
1. Change subsection d to read as follows:

d. Installation shall be on wall over cooking range, near ceiling, and in accordance with manufacturer's instructions; opening in wall is provided for that purpose.

Section 4, CIRCULATING FANS
1. Change the first sentence of subsection c to read as follows:

c. Installation shall be in partition separating living room from bedroom No. 3, near rear wall and near ceiling; air inlet side shall face living room; air discharge side shall face bedroom No. 3.

DIVISION DHS-13, INTERIOR ELECTRIC WIRING
Page 13-ii, NOTES TO THE ARCHITECT OR ENGINEER
1. Change the second paragraph to read as follows:

NOTE THAT THIS DIVISION INCLUDES SPECIFICATIONS FOR WIRING FOR EVAPORATIVE COOLERS, WALL TYPE VENTILATORS AND CIRCULATING FANS. WALL TYPE VENTILATORS ARE MANDATORY IN ALL AREAS. INCLUDE CONNECTIONS TO EVAPORATIVE COOLERS AND CIRCULATING FANS WHEN THEY ARE INCLUDED IN THE PROJECT. SEE NOTES TO THE ARCHITECT AND ENGINEER UNDER DIVISION DHS-12c.

Section 5, INSTALLATION OF OUTLET BOXES, COVERS, DEVICES AND PLATES
1. In subsection e, last line of schedule, omit the words "transfer switch" "4 feet 6 inches" and add the following: "water heater outlet" "1 foot" in the second column.

Section ( ) WIRING CONNECTIONS TO ELECTRIC WATER HEATER
1. Change subsection d to read as follows:

d. Locate 20 amp. wall type toggle switch accessible to and adjacent to heater.

DIVISION DHS-14, SITE IMPROVEMENTS (ROADS, WALKS, ETC.)
Page 14-i, NOTES TO THE ARCHITECT.
1. Disregard the fourth and fifth paragraphs entirely. Make all walks of concrete.
2. Omit Section 6, CONCRETE BLOCK WALKS and Section 7, AGGREGATE WALKS.
3. Include a new section as follows:

Section 16, SPLASH BLOCKS
Provide concrete splash blocks 12 inches wide by 24 inches long and 2-1/2 inches thick at thinnest point under each downspout. Blocks shall have raised lip approximately one to 1½ inches high on both sides and on one end. Bed splash blocks firmly with discharge flush with finished grade.

DIVISION DHS-15, UTILITIES (SEWERS, WATER AND GAS)
Section 5, WATER DISTRIBUTION SYSTEM MATERIALS
1. To provide for the use of copper tubing, add a new subsection b,(4), as follows:

(4) Copper tubing, seamless, annealed. Type K, complying with Federal Specification W-W-T-799a; fittings wrought copper or cast bronze of solder-joint or flared-tube type. Solder shall be of a composition recommended by the manufacturer of the fittings.

Section 6, WATER DISTRIBUTION SYSTEM INSTALLATION
1. Add a new subsection d,(5), as follows:

(5) Copper tubing shall be laid by experienced workmen and with jointing performed in accordance with the manufacturer's recommendations. Observe care not to scar or deform the tubing. In fills of cinders, rock or rubbish lay the tubing on and surround tubing with at least six inches of sand or other suitable soil.

DIVISIONS DHS-16 TO DHS-20, INCLUSIVE -- No changes.