

- (b) Drawings and Submittals. See General Conditions. Contractors are invited to bid on available competitive makes of materials and equipment in addition to specified items. To obtain consideration, however, each item shall be listed as a proposed substitution, and difference in cost, if any, shall be stated. In addition, all proposed substitutions must be: (1) submitted within thirty days following award of contract, (2) shown to Architect to be equal or superior in all respects to material specified, (3) accompanied by shop drawings and/or complete descriptive information. All changes required by or resulting from substitutions shall be the complete responsibility of the Contractor and shall be made at no additional cost to the Owners. The Contractor shall make no substitutions of materials or equipment without written approval of the Architect.
- (c) Tests and Guarantees. In addition to any guarantee mentioned in these Specifications, this Contractor will leave installations in complete working order, free of defects in material and workmanship. He shall repair or replace at his own expense any part that may develop any defects due to faulty workmanship or materials. Tests shall be repeated after defects have been eliminated. Caulking screwed joints, cracks or holes will not be accepted. The heating equipment and system shall be adjusted for proper distribution of air temperature control and the elimination of drafts, noise, vibration, etc.
- (d) Layout. Layout of duct work, equipment, piping and fixtures shown on Drawings is diagrammatic and shows general arrangement only. Should a Contractor fail to consult with the Architect concerning any complications in layout work that conflict with the interest of other work, said Contractor will be subject to relocating his work without cost to the Owners. Each mechanical contractor (including electrical) shall furnish and place sleeves in forms for concrete work for passage of all pipe plus covering. Pipe and sleeves through foundation walls shall be caulked water-tight with PRC 5,000.

A. Heating Work. This work includes all labor, materials, equipment and services necessary for a complete job of heating as shown on Drawings and/or Specifications herein. All range wiring, gas, oil, and connections to motors and controllers will be furnished and installed by the electrical contractor. Directions of the equipment manufacturer shall be followed covering points not shown on Plans or Specifications. Copper fittings shall be soldered with 98-5 solder as directed by manufacturer. Hold all pipes and tubes in place with insulated adjustable ring hangers. Isolate all pipes and tubes from building materials with 3/8" hair felt (after compression) or equal. The entire piping shall be pressure tested @ 100 psi minimum, and accepted by the Architect before the slab is poured. Assist the electrician in wiring line voltage controls of the hot water system. Examine the job site. For heating plan, equipment and details, see Sheet # 8. The heating contractor shall guarantee his work as covered in the General Conditions and in the General Requirements under "Mechanical Work". In addition, this contractor, prior to undertaking this work, shall submit to the Owners a letter stating the above guarantee requirements, and that he shall repair or replace at his own expense any part of the heating system due to faulty material or workmanship and without evidence of damage or patching to existing surfaces.

B. Plumbing Work. Work under this contract shall be governed by the General Conditions and the General Requirements covered under "Mechanical Work" through Item # e. Work includes all labor, materials, fixtures and equipment required for the proper functioning of water and sewage systems. Coordinate plumbing work with other work specified and shown on Drawings. Collect vents so as to minimize the number of vents through the roof. Cut vent pipes at 4" above roof. All valves shall be the product of a single manufacturer: Crane or an approved equal (125 psi of steam service rated). Gate valves shall be Crane # 438 with lock shield keys. Keyed hose bibs are 3/4" rough brass. Unions are Mueller # C-107 in copper piping; Stockham Figure 694 in galvanized malleable iron, and Epco dielectric unions where copper connects to steel. Provide the necessary plumbing for equipment by Owners. Backfill and compact all excavations. Obtain and pay for plumbing permits including sewer connection fees.

- (a) Testing. Water piping shall be tested at 100 psi for 8 hours without drop in pressure. Fuel piping shall be tested at 50 psi air pressure for 8 hours without drop in pressure. Soil waste and drainage systems @ 10' head of water (minimum) shall be held for 2 hours in a 2" diameter stand pipe (minimum). Adjust and regulate all faucets, valves, water heating equipment, etc., and leave in perfect working order for Owners.

- (b) Piping. Insulate all hot water pipes out of slab from heater to fixture with "Rubatex" (3/4" wall thickness) or an approved equal. Take every precaution to minimize plumbing noises. Insulate supply and waste pipe from building materials with sleeves of "Rubatex" or 1" felt pads. Make changes in pipe sizes with reducing fittings rather than using bushings or street elbows. Install unions on each branch line adjacent to each screwed valve, and on all lines connected to equipment.

1. Soil waste, drain and venting systems, use cast iron service weight underground and ABS plastic DWV. Connect waste system to the street sewer.
2. Water pipe: (a) Pipe under and within the building shall be copper, type K hardtemper for underground, and type L for above ground. Solder joints with 95-5 soft solder and flux. Fittings and unions shall be streamline wrought copper by Crane or equal. (b) Pipe outside the building may be PVC-1220 schedule 40 plastic pipe. (c) Install a pressure reducer valve at the main, close to building in addition to a water hammer arrestor. Use Absorbotron # 1485-2 as manufactured by Josam. Run a 1" water supply line from street to house and pool equipment.
3. Gas pipe: Fuel gas pipe from the L.P. tank to the pool heater and house boiler shall be black steel schedule 40 A-120 with 150# black malleable iron fittings. Dip wrap and connect to L.P. tank.

- (c) Plumbing Fixtures: (Kohler in Mexican Sand color.) Submit color chips for Owners' approval.

1. 3 W.C's "Bolton" # K-347 EAB
2. 4 lavatories "Brookline" # K-2202-F
3. 3 shower stall "Trinidad" # K-1436, with K-7226-T, K-7350, and K-9130.
4. 2 tubs 5'. "Seaforth" # K-745-S and K-746-S with K-7034-T and K-7172-R.
5. Sink "Lakefield" # K-5925-A
6. Bar sink "Addison" plus K-7894
7. H.W. HEATER. DAY & NIGHT # 7013-F (144L) OR EQUAL.

C. Electrical Work. Work under this Contract shall be governed by the General Conditions and the General Requirements covered under "Mechanical Work" through Item # e. Provide all labor, materials, equipment, services, etc. required for the complete and proper installation of all electrical work shown on Plans and/or materials including light bulbs and equipment not specifically mentioned herein or noted on Plans but which is necessary to make a complete working installation of all electrical systems shown on Plans or described herein. Compact and backfill excavation work. Electrical drawings are schematic but shall follow as actual construction and the work of other contractors will permit. All deviations from Drawings required to make the work of this contractor conform to the building as constructed and to work of other contractors shall be made by this contractor at his expense. The exact location of panel board, main switches and each outlet of each wiring system shall be as directed by the Architect. All material shall be new and listed by the Underwriters Laboratories as conforming to their requirements, and bearing their labels when furnished by that agency.

- (a) Tests. On completion of work and adjustment of all equipment, all systems shall be tested to demonstrate to the Owners that all equipment furnished and installed and/or connected shall function electrically as required.

- (b) Basic materials are as follows:

1. Conductors shall be in general sized so that a drop in potential under full load be less than 1 1/2% from service switch to outlets. Rate regular outlets at 100 watts each. Number 12 AWG shall be minimum size conductor except for low voltage wiring. All wire and cable shall be color-coded.
2. Breakers for branch circuits shall have trip elements of required sizes with On-Off "tripped" positions. Multiple breakers shall be common trip (no handle linkage accessories).

- (c) Electrical service system: Contractor shall verify termination requirements and pay all costs not paid by the Utility Company. The neutral wire of the total interior wiring system shall be permanently grounded to the water service near the point of entry to the building, and as directed by the Architect. Electrical service shall be 100 amperes, and underground to the house, 120/240 volt, 1 phase, 3 wire.

- (d) Branch circuit wiring shall be no less than # 12 type TW protected by 20 A circuit breakers. Use larger wires as required to reduce voltage drop.

- (e) Light fixtures, outlets, switches, fans, etc. shall be provided and installed in accord with fixture schedule. (See Sheet # 2). Provide 75 watt light bulbs, tungsten fluorescent tubes as manufactured by Sylvania.

- (f) Identification: Panel boards used for operating circuits, appliances and equipment shall be identified with name plates securely fastened in place, and with Dymo-Tape when necessary.

- (g) Communication systems: Contractor shall verify locations and termination requirements with Utility Companies and pay all applicable charges. Location of telephone and T.V. outlets shall be approved by Architect and Owners. Verify exact requirements with Telephone and T.V. Companies, and provide any labor and material required for the installation of telephones and T.V. outlets.

- (h) Electric power equipment: Connection requirements of every piece of mechanical equipment including pool equipment by Owners shall be coordinated and verified with other mechanical contractors. All automatic line voltage controls for heating and plumbing equipment shall be furnished by those contractors and installed and wired by the electrical contractor. All control wiring for heating and plumbing equipment shall be performed under the direction of those contractors. Provide a 3/4" conduit between the Hi-Fi closet and the speaker positions above refrigerator and ovens in the kitchen.

SPECIFICATIONS
SHEET NO. 10.

HOUSE FOR MR. & MRS. JAMES O'BRIEN 17-MILE DRIVE PEBBLE BEACH, CALIF.
MARK MILLER ARCHITECT FLANDERS DR. CARMEL, CALIF.

W. M. May '72