will not be allowed Right of Rejection: No exterior or interior finishing shall be done onditions which would jeopardize appearance of work in any way. Architect shall have the right to reject all work which is unsatis-

factory and to replace such work at contractors expense

nished Areas: within the interior of the building where painting of walls and ceilings is excluded, Contractor shall include the priming, under-coating, and enameling of doors, trim, and items of black iron, i.e., pipe, brackets, hanger rods, etc.

Equipment provided with a factory gloss finish need not be painted. des not pertain to ceiling and wall registers. (Galvanizing shall not be considered as factory finish).

Rejected Materials: Remove from the site immediately upon notification from the Architect.

<u>Thinning</u>: Paint materials thinned only as directed by manufacturer's printed instructions. At completion of work all paint work which does not show uniform color and texture will be deemed to have been incorrectly thinned and Contractor will be required to apply additional coats until uniform results are obtained.

Colors and Shades of Colors of all coats of paint, enamel, stain or arnish as directed by the contracting officer. Each coat of paint of slightly different shade, as directed. Allowance shall be made for multi-coloring, so that certain work such as ceiling beams, dadoes. wood trim or walls may be finished in more than one color. The color may vary from each wall of each room in addition to dadoes, columns and ceiling colors.

<u>Cleaning</u>: In addition to requirements of the General Conditions:

- A. Rubbish, waste, or surplus material removed from time to time, and all adjacent surfaces and items cleaned of paint material before it has time to dry.
- B. The use of thinners and solvents on hardware or other finishes done with care so as to avoid possible damages or removal of protective coatings or finishes

GENERAL REQ MECH WORK

1.0 GENERAL CONDITIONS

The requirements of Section 1 are herein made a part of this Section. The following are minimum requirements and shall govern except as exceeded by requirements of other Contract Documents or Building Laws, Codes and/or Ordinances having jurisdiction at the job site.

2.0 PERMITS AND FEES

A. This Contractor shall obtain and pay for all permits and inspections necessary for the work described in these Specifications and Drawings. Certificates of Inspection required by local authorities shall be delivered to the Architect. Application for these services shall be made in writing by this Contractor in the name of the Owner and written records of the application forwarded to the Architect. 3.0 CONTRACTOR'S RESPONSIBILITY

A. This Contractor shall be dully responsible for the good condition of all materials and equipment until final acceptance by the Owner. This Contractor shall assume full resoonsibility for safety, loss or injury to persons or property resulting from neglect by carelessness of his

4.0 SHOP DRAWINGS AND RECORD DRAWINGS

match the adjoining work.

shall be 24 inches minimum cover.

A. Submit in accordance with requirements of General and Supplementary Conditions. 5.0 SUPERVISION

A. This Contractor shall do all cutting and patching as required by the Architect for proper installation of the work in this Contract. All

6.0 EXCAVATION AND BACKFILLING A. All excavation for work to be done under these Specifications shall be done by this Contractor. All underground lines outside building

patching shall be of same materials, workmanship and quality and shall

B. Backfilling of trenches, etc., shall be in six inch layers of dampened, tamped earth. Each layer shall be tamped separately to the density of the adjacent compacted material

C. Puddling will be permitted for backfill six feet or more outside of the buildings but not under paved areas or at locations of the electrical conduit. Density shall be as specified above. conduit shall not be run in excavations provided for the

Sewer and water shall each have a separate trench where possible. Where a common trench is used, the water pipe shall rest on a solid shelf at one side of trench with 12 inch minimum from top of sewer pipe to bottom of water pipe.

7.0 CLOSING IN UNINSPECTED WORK

A. If any work is covered or enclosed before approval has been given, this Contractor shall uncover this work at his own expense. 8.0 HANGERS AND SUPPORTS

A. This Contractor shall provide all foundations, hangers and supports required for proper installation of equipment and materials under this Division of the Contract. 9.0 CLEANING UP

A. Perform in accordance with the requirements of the General and Supplementary Conditions. All exterior surfaces of equipment and pipng, etc., shall be thoroughly cleaned of dirt, grease, cement, etc. All surfaces requiring painting shall have all rust, grease, and ilspots thoroughly removed. All fixtures and plated trim shall be thoroughly cleaned and polished.

10.0 CONTINUITY OF SERVICES

A. This Contractor shall furnish and install any temporary services required.

1.0 PRELIMINARY OPERATION

A. This Contractor shall operate any portion of systems and equipment at the request of the Owner. This operation shall be under the supervision of the Contractor. Preliminary operation shall not be considered as acceptance of any work under this Contract nor shall it affect the guarantee period for equipment so operated.

12.0 SITE CONDITIONS

A. Before submitting a bid, this Contractor shall examine the job site and familiarize himself with all site conditions. No allowances shall be made to this Contractor for failure to comply with this require-

13.0 SPECIFICATIONS AND DRAWINGS

A. It is intended that Specifications and Drawings shall be correlated with one another. Anything represented on one but not the other shall be considered as presented on both Specifications and Drawings. 14.0 GUARANTEE

A. All materials and equipment installed under this Contract shall be guaranteed free from mechanical, electrical and workmanship defects for a period of one year from date of final acceptance. This Contractor shall be responsible for all damage on the premises caused by leaks of breaks in pipe and fixtures installed under this Contract

15.0 LOCATIONS

A. The work as laid out is to some extent diagrammatic and the location thereon indicated may be approximate only. The Contractor, therefore, shall install all equipment, apparatus, pipe runs and the like as

1. Adhere to the location indicated as far as possible. 2. Maintain ample headroom in all rooms and passageways, clearance around all apparatus and equipment and under pipelines for unrestricted passage and for easy servicing of all apparatus, equin-

ment devices, and the like.

E ABOVE BRAWINGS AND SPECIFICATIONS AND IDEAS, DESIGNS AND ARRANGEMENTS BEPE THE ABOVE SHAWNES AND SPECIFICATIONS AND ISSUE SEASONS AND ANHANGEMENTS THE SERVICE THE RECEIPED HE ARCHITECT. AND NO PROTECTION THE RECEIPED HE ARCHITECT. AND NO PROTECTION WITH ANY WORK OR PROJECT OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY MAYE SEEN PREPARED AND SEVELOPED WITHOUT THE WRITTEN CONSENT OFTHE ARCHITECT, VISUAL CONTACT WITH THESE BRASHESS OR SPECIFICATIONS SHALL CONSTITUTE CONCLUSIVE EVIDENCE OF ACCEPTANCE OF

PRITIEN BINEMSIONS ON THESE BRANINGS SHALL MAVE PRECEDENCE OVER SCALED BINER ON CONTRACTORS SMALL VENITTAND BE RESPONSIBLE TOR. ALL BINERSIONS AND CONDITION

N THE JUBAND THIS OFFICE MUST BE MOTIFIED OF ART VARIATIONS FROM THE BIMENSION

ICE FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION

3. In the event there is interference between this Contractor's work and the work of other trades, the Contractor may move or offset the work of any of the trades if specifically approved by the

4. Verify the exact locations of all fixtures and other apparatus or devices as indicated on the Drawings. In the event these Drawings do not indicate the exact locations for all such fixtures, apparatus or devices, the Contractor shall obtain the exact locations from the Architect.

16.0 ELECTRICAL HORK

A. <u>Automatic Electric Control Equipment</u>: It is the intent of the Drawings and Specifications that all automatic electric control equipment and materials pertaining thereto shall be furnished and installed under the Plumbing and Air Conditioning Sections of the Specifications. Automatic electric controls include such items as thermostats, solenoid and other electrically operated valves, transformers and starting switches. Materials, installation methods and workmanship shall conform to the requirements of the Electrical Section of the Specifications.

1. Conduit, wiring, conductors, outlets, disconnect switches, etc. will be furnished and installed under the Electrical Section of the Specifications.

Electric Power-Driven Equipment: It is the intent of the Drawings and Specifications that all motors and power-driven equipment connected with the work of these Sections shall be furnished under the Mechanical Sections of the Specifications. The installation of motors and power-driven equipment is included under the Plumbing and Air Conditioning Sections of the Specifications.

1. The Electrical Drawings and Specifications indicate and specify conduit, conductors, outlets, etc., disconnect switches, starters and making of final connections.

Starters: Starters for mechanical equipment as noted on the Control lagrams shall be furnished under Plumbing and Air Conditioning Sections for installation under the Electrical Section. Starters included with packaged equipment or as otherwise noted on the Control Diagrams shall be furnished under Plumbing and Air Conditioning Sections and shall be complete with suitable overload protection.

D. Responsibility for the proper operation of automatic electric controls and equipment and of electric power-driven equipment furnished under these Sections of the Specifications is included in the Plumbing and Air Conditioning Sections of the Specifications.

17.0 ACCESS OPENINGS

A. It shall be the responsibility of the Contractor to provide sufficient and convenient access openings, panels, etc., in the building construction where required for the maintenance or the adjustment of dampers. valves, installation and/or removal of all equipment, or other items of the various systems and equipment.

18.0 EXAMINATION OF DRAWINGS AND SITE

the Structural and Architectural Drawings for this work, along with Specifications for same in addition to the Drawings and Specifiactions governing the work in this trade. He shall also visit the site of the proposed construction and familiarize himself with all the site conditions. No subsequent allowances will be make to the Contractor because of his negligence in complying with the above, or his alleged inability to understand the requirements.

A. Before submitting his bid, the Contractor shall carefully examine both

A. The location of the existing water, sewer, gas and electric services shown on the Drawings is approximate and shall be checked by this Contractor for exact location. 20.0 SAFETY PRECAUTIONS A. In accordance with generally accepted construction practices, the

Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. B. It is understood that the responsibility for proper attention to the above stipulations is included under this work. In case of any doubt

The duty of the Architect to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction

as to what is intended or what must be provided in matters of public

safety, request such interpretations or clarifications from the

21.0 RULES OF LOCAL UTILITY COMPANIES

A. Comply with all rules of the utility companies or districts. Before submitting bid, check with each utility company supplying services to this installation. Determine from them all costs and requirements for the services and include <u>all</u> such costs in the bid. This includes services, meters, vaults, valves, sewers and all connecting fees.

PLUMBING

MATERIALS, FIXTURES AND EQUIPMENT

A. Soil, laste and Vent Piping Inside Building and Under Concrete: SHALL BE AFFRONCED
ABS PIPING OR STOWNEIGHT, coated cast iron soil pipe with bell and spigot fittings with neoprene compression joints or hubless fittings with neoprene gaskets and stainless steel shield and clamps. All cast iron pipe shall bear the cast iron label of the Cast Iron Institute. Sewi piping not under the building and not under concrete may be vitreous clay tile OR APPROXED FUCPIPING

B. <u>Vent Piping and Drain Piping Above Floors</u>: Sizes 3" and larger shall be standard weight cast iron, bell and spigot, pipe and fittings with lead and oakum joints. Vent piping and drain piping 2-1/2" and smaller

weight galvanized steel pipe with cast iron semi-recessed drainage Nater Piping shall be Schedule 40 galvanized steel pipe with galvanized malleable iron banded fittings, or type M copper w/copper FITTINGS. All exposed piping appurtenant to fixtures shall be chrome plated brass

fittings: Protect underground pipe BELOW T O. Gas Piping: Pipe shall be Schedule 40 black steel pipe with black malleable, banded 150 pound fittings or tube turn, or equal, welding fit-

tings. Protect underground sipe per 4.0 T.

E. <u>Escutcheons</u>: Chrome plated brass with set screws. F. <u>Flashing</u>: 4 pound lead.

G. <u>Fixture Stops</u>: American Standard or Kohler.

H. Unions: Right and left couplings for fuel gas except that ground joint unions may be used at fixture connections. Unions for steel water lines shall be galvanized, 150 lb. malleable iron ground joint.

. Cleanouts: As shown on Drawings and shall be Zurn, Josam, Smith, Wade or equal, as follows:

Wall - ZN1440-1 with stainless steel cover; Finished Floor - ZN1405-1;

J. Yard Boxes: As shown on Drawings but not smaller than Christy #B16, $12'' \times 22-1/4''$.

K. Air Chambers shall be not less than 18" long and of the same material and sizes as pipes in which they are installed, install at each fixture or at end of header serving battery fixtures. . <u>Water Valves</u>: Steel Piping.

	Gate 2" & Less	Gate 25" & Over	Globe All	Check 25 & Less
rane	438	461	7	37
enkins	370	326	106A	92A
alworth	4	719-F	95	406
ennedy	427	058	89	440

Furnish "T" handle wrench for underground valves.

M. Gas Valves: Square head brass cocks with check, Crane #254, or equal. nish each valve with operating wrench, "T" handle wrench for under-

N. <u>Isolators</u>: Semco Isolators at each pipe hanger. F.N. Maloney Company galvanized pipe insulator at each ferrous to non-ferrous pipe connection. O. <u>Hose Bibbs</u>: As shown on Drawings.

P. <u>Pipe Hangers and Supports:</u> Grinnel Company #149 ring type, with 3/8" hanger rods, Unistrut and "V" support. Spacing of hangers and support shall not exceed 6'-0" for 1/2" pipe, 8'-0" for 3/4" 1" pipe and 10'-0' for pipe 1-1/4" and larger, and same shall be provided at each piping offset. Semco pipe isolators shall be provided around pipe at hange

Q. <u>Sleeves</u>: Standard weight pipe or 24 gauge galvanized iron. Greater n diameter by 1" than the pipe. Sleeves for copper pipe shall be Orangeburg Pipe. Any insulation or pipe protection on either side of the wall shall be carried through the sleeve.

R. Access Boxes: Karp, Zurn, Smith, or equal, 10" x 10" prime coat and

S. <u>Fixtures and Equipment</u>: As shown on Drawings. Fixtures on Drawings re specified American Standard for convenience only. Kohler fixtures of same quality, appearance and comparable catalog number as shown on comparison chart in the plumbing manual, "The Trade Book", will be accepted as equal without request for substitution except fixtures of one (1) manufacturer shall be used throughout. Mater heater shall be as indicated on drawings and equipped with a combination temperature-pressure relief valve having a capacity not less than the input capacity of the heater. Install thermal element in top six inches

Underground Pipe Protection: All underground black and galvanized steel pipe shall be protected with "X-Tru-Coat" brand extruded plastic or shall be machine wrapped with Johns-Manville "Printed Trantex" using a single wrap 20 mil thick with 1/2" overlap on straight pipe and two (2) wraps of 10 mil tape on fittings and field joints.

U. <u>Insulation</u>: All hot water piping shall be insulated with standard nick sectional pipe covering with integral fire retardent jacket,

V. Trap Primers shall be E & S Primer valve or Sloan as indicated on

GENERAL REQUIREMENTS A. <u>Piping Installation - General</u>: Pipe lines shall be constructed of full length sections of pipe as specified. No short sections shall be used except where length of runs require less than one full length of pipe. Short sections, where permitted, shall be fabricated from dimensions taken at the site.

Springing or forcing piping into place will not be permitted. Piping shall be installed in such a manner as to prevent any undue strain on the equipment.

Joints shall be smooth and unobstructed inside, and cut pipe ends shall be thoroughly reamed to remove all burrs. Each length of pipe and each fitting shall be carefully inspected and all obstructions removed prior to fabrication.

Screwed joints shall be made tight with tongs and wrenches. Any leaky onnection shall be remade with new materials. The use of thread cement or caulking to make joints tight is absolutely prohibited. Air chambers as specified shall be installed in a vertical position at the end of each run of water piping serving a fixture or group of fix-

Water connections to all equipment shall be full size of the connection up to the fixture stop or shut-off. Exposed fixture stops, piping and/ ir tubing, supplies, waste piping and traps in finished rooms shall be

Piping installed outside of building below grade shall have a minimum of 24" cover to finished grade. Close nipples shall not be used.

Rough-in shall proceed as rapidly as the general construction will permit and shall be complete and tested before any lathing, plastering or other work is started. Nork shall be fitted to the available space and shall be accurately roughed in Each piece of equipment and run of piping shall be anchored to struc-

tural supports to resist a lateral force of 50% of the equipment and/ or piping operating weight. This also applies to vibration isolators Sewer, Soil, Waste and Vent Piping: All vent pipes passing through roof shall extend at least seven inches (7") above the roof line and

shall be flashed and counterflashed with four (4) pound lead peened in Install cleanouts in all drainage lines, where shown and/or required by code, and in addition at each change in direction and at intervals not to exceed one hundred (100) feet in horizontal runs, unless otherwise shown on drawings. All cleanouts must be extended as specified. Lines must have a uniform continuous fall to the point of connection

mains and branches shall be set to grade by instrument. Vent pipe below grade shall be cast iron soil pipe. All horizontal vent lines shall pitch up to the vent stack at a minimum of 1/4" per foot. Vent piping shall be graded for proper ventilation and to allow piping to free itself quickly of condensation or water. Vents shall be ganged wherever possible.

with existing sewer and in general, this should be one-quarter (1/4)

inch per foot, unless otherwise shown on the drawings. All sewer

SPECIAL REQUIREMENTS

A. Tests: Perform all tests to the entire satisfaction of the Architect nd constituted authorities. Tests shall be made in their presence at a time suitable for them and shall prove all lines to be tight and free

Furnish necessary labor and equipment for testing and proving tight all

show no loss in pressure or visible leaks after a minimum duration of

parts of the work. Costs of making such tests and replacing and/o repairing any damage resulting therefrom shall be borne by the Contrac-Systems shall be tested in accordance with the following schedule and

System Tested	Test Pressure Psig	Test With
Soil, Waste, Drain Vent and Storm Drain	Fill with water to top of highest vent, allow to stand 'two (2) hours or longer, as directed.	Water
Hot and Cold Water	100 lbs.	Water
Gas Piping	1-1/2 times the working pressure with minimum of 100 lbs.	Air, Soap and Yater all Joints

four (4) hours at the test pressure indicated.

B. <u>Connections and Accessories for Equipment Furnished by Others</u>: Ascertain quantity and details of same, then rough-in, supply and install accessories and make connections as required to equipment furnished

lead and oakum joints. Vent piping and drain piping 2-1/2" and smaller and located 6" or more above the building floor shall be APPROXED AND PIPHE OF C. Equipment Data: Complete data covering physical dimensions and rough-in information shall be supplied to other trades working in connection with the work of this part. PLUMBING FIXTURES INSTALLATION

A. Within thirty (30) days after the Contract has been signed, the Contractor shall submit six (6) portfolios to the Architect for approval with full description and cuts of the fixtures to be used. No fixtures shall be installed until portfolios have been approved.

B. Plumbing fixture trim and exposed supplies and wastes shall be brass with polished chrome finish unless otherwise specified. Individual loose key or screwdriver stops shall be provided for all supplies, and unless otherwise approved by the Architect, shall be mounted under the fixtures. All wastes shall be separately trapped. Exposed supplies and traps to wall shall be furnished with escutcheons as specified.

.. Wall-hung fixtures shall be securely attached to a 3/8" thick x 6" wide steel plate which shall extend to at least one (1) stud beyond the first and last fixture mounting point. Plate shall be drilled and tapped at time of installation of fixture. Fixture hanger or arm shall be supported free of finished wall by means of jam nuts. For wood construction, study shall be notched and steel plate set flush with the surface. Plates shall be securely bolted to each stud crossed by two (2) 1/2" steel bolts on 4" centers with 1/8" minimum 1-1/2" backup plates. For steel construction, plates shall be securely welded to each stud crossed by a continuous vertical fillet weld of same size as stud thickness. Fixtures with back, specified with supporting arms, shall in addition to the above specified plates, have fixture hangers securely attached to 2" x 8" wood backing.

D. Floor-type water closets shall be set on Smith slotted cast iron floor flanges with Smith #569 impregnated gas gasket and shall be held in place with 5/16" solid brass bolts. Putty will not be permitted for

E. Piping supporting flush valves or hose bibbs shall be securely strapped to the building structure at each valve to prevent displacement through manual pressure applied to the valve.

F. Pipe size for fixture connections shall conform to that shown in the fixture schedule on the Drawings. G. <u>Equipment Connections</u>: Water and drain connections shall be provided for each piece of equipment requiring same as indicated on the Drawings. Gas Connections shall be provided for alligas-fired heating equipment

H. All Plumbing metalic and non metalic shall have detector tape -12". AIR CONDITIONING

FOUNDATIONS AND SUPPORTS

A. Except for the work included in other trades, this Contractor shall provide all foundations, supports and hangers and other items as required to install the equipment as specified or as shown on Drawings. Mechanical Contractor shall furnish mounting templates to other trades as required. All fans, air conditioning units and compressors shall have vibration isolators of the type indicated in all supports and/or bases and shall

not have any stays, guys or supports which will short circuit the vibration dampeners. All equipment shall be supported, braced and cross-braced in such a manner as to prevent sway and/or lateral move-STAGING, ETC.

A. Provide all staging, scaffolds, patforms, ladders or similar facilities required to properly carry on the work.

In addition to the requirements of Section — the following requirements A. The operation of all parts of the system shall be noiseless to the extent that no objectionable sound of operation will be heard in the

occupied portions of the building.

capacity to maintain all conditions as set forth in the Specifications and/or as shown on the Drawings. C. The sizes of all apparatus, piping, ductwork, etc., are minimum and the Contractor shall not decrease them in any way.

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. All apparatus or equipment shall operate in strict accordance with

detailed specifications covering each item, and shall be of sufficient

D. Air handling equipment shall be guaranteed by the manufacturer to operate without objectionable noise. The Contractor shall, at his expense, make any adjustments or changes required to produce a condition of quietness satisfactory to the Architect. Such adjustments or changes shall not reduce the equipment capacities called for on the

PAINTING

OPERATING INSTRUCTIONS

GENERAL REQ

and supplements.)

Contract.

PERMITS AND FEES

CONDUCT OF THE WORK

of his employees.

RECORD DRAWINGS

LOCATIONS

See General Conditions.

possible.

Architect.

VERIFICATION OF DIMENSIONS

thereof.

manner.

PRELIMINARY OPERATION

CUTTING AND PATCHING

FOUNDATIONS AND SUPPORTS

EXCAVATION AND BACKFILLING

REVISIONS

. 13.85 OSA CHANGES/REBIC

CONTRACTOR'S RESPONSIBILITY

. State Board of Healtn.

CAL-OSHA Regulations.

obtained and delivered to the Owner.

EXAMINATION OF DRAWINGS AND SITE

FLASHI:IG A. Wherever any part of the heating, ventilating and air conditioning system has to pierce the roofing or exterior walls, this work shall be done with care, and any openings shall be flashed absolutely watertight.

DUCTIORK A. General: The drawings are diagrammatic and indicate the sizes of pipes. icts and equipment. The exact location by dimension of all equipment, piping and ducts shall be governed by the Architectural and Structural drawings. This Contractor shall lay out the work in such a manner and at such times, as to be coordinated with the work of other trades. making arrangements for the installation of sleeves, hangers, anchors, etc., as required, so as not to delay the work of other Contractors.

B. Ducts and Sheet Metal Tork - Air Conditioning, Heating and Ventilating: 1. Ducts, plenums, access doors, supply and return ducts, fresh air intakes and exhausts shall be installed as indicated or required and shall be made up of sheets of galvanized steel of the following gauges:

Up to 12" diameter or largest side No. 26 Ga. U.S.S. 31" to 54" " " " " " 22 " " " " 55" to 60" " " " " 20 " " " "

2. Duct construction, joints, stiffeners, etc., shall conform to the requirements of the Uniform Mechanical Code.

3. Round ducts may be used for equal size rectangular ducts where structural conditions permit. Round ducts shall be sheet metal of gauges specified. 4. All changes in size of ducts shall increase gradually with a slope

of not more than one foot in three feet and one foot in five feet where possible. 5. Turns shall be made with a throat radius of not less than 1-1/2

times the duct width or shall have turning veins. Turning veins shall be double thickness air foil type. 6. All horizontal ductwork will be strongly supported with galvanized

hangers at not greater than five foot spacing. . Sheet Metal Connections: "Ventglass" connections shall be used to connect ducts to equipment.

D. <u>Dampers</u> 1. Balancing dampers where indicated or required for proper balancing of the system, shall be constructed of No. 20 gauge galvanized steel and shall be locked in place by indicating quadrants Duro Dyne No. KS145L. Dampers shall be grouped for easy access. Access doors or panels shall be provided in building construction where required for damper adjustment.

E. <u>Fire Dampers</u>: Shall be in accordance with Part #1, Section 132 MBFU Pamphlet No. 90A and shall be State Fire Marshal Approved. Suitable access shall be provided for servicing all the dampers. Refer to Drawings for detail of fire dampers and metal gauges. F. Under no circumstances shall hangers, supports or other pipes pierce the ducts. All hangers shall be firmly and suitably secured to the lding structure by the use of angle supports secured to wood struc-

ture with lag screws of the proper size. Vertical ducts shall be

strapped to the wall with galvanized iron bands secured to structural

G. All ducts shall be installed to clear beams, etc., even if Drawings do not indicate same. Contractor shall particularly check the Elec-

trical Plans so as to coordinate with this Trade. H. Duct systems shall be assembled, erected and adjusted in such a manner as to insure a minimum of noise and vibration in the operation. En tire system shall prove quiet to a reasonable degree satisfactory to Architect. Any adjustment required to produce quietness shall be made by the Contractor before work can be deemed to be finished and accepted

Such adjustment shall not reduce the specified air volumes. I. All transverse joints of supply and return ducts shall be taped with 4-inch wide 4-ounce canvas satumated with Arabol to produce air tight

REGISTERS, GRILLES AND DIFFUSERS

A. General: These items shall be of the types, sizes and quantities indiited on the Drawings and shall have the required capacities. All adjustments shall be made to deliver the required air quantities

B. Performance: Supply registers, grilles and diffusers shall provide the required air throw and spread with no apparent drafts area. Any air distribution accessories required to affect these conditions shall be provided and installed by the Contractor. Grilles, registers, or ceiling diffusers causing excessive air movement, drafts or objectionable noise, shall be replaced at no cost to the Architect.

DUCT INSULATION

A. General: Insulate all supply and return air ducts, mixed air plenums, and equipment as required.

1. Metal supply and return ducts concealed in attics except where an acoustic lining is to be used shall be 3/4 pound density Owens-Corning Fiberglas, or equal, duct insulation, 2" thick. Firmly wrap insulation around duct with all joints lapped a minimum of 2". Securely fasten insulation in place with 16 gauge soft annealed galvanized wire spiral wrapped 6" o.c. or with staples spaced not more than 12" on centers for straight runs and 3" on

centers for elbows and fittings. Sheet metal ducts with acoustic lining need no further insulation. 2. <u>Duct Lining</u>: shall be applied on all supply and return ducts for a length of 15-feet from the point of connection to the air conditioning units. All insulation and adhesive shall conform to Standard No. 90A of the National Fire Protection Association and NBFU and UL Approved, with a flame spread rating of 25 or less.

and a smoke development rating of not over 50. The duct lining shall be 3 pound density and 1-1/2-inch thick Owens-Corning PPG "Superfine", Johns-Manville "Micro-Bar" or CSB

"Ultra-Liner" The duct lining shall be secured to the duct interior with adhesive with minimum coverage of 50% of the metal surface, with the coated side facing air stream. Longitudinal joint shall be formed in one corner of the duct with all joints tightly butted and heavily sized with Lagfas or Arabol lagging adhesive to assure continuity of the surface. Exposed edges of insulation shall be coated with a heavy layer of mastic prior to installation in the duct system. Where width of ducts or casings exceed 18-inches, sheet metal screws and washers or adhered mechanical fasteners in addition to adhesive specified above shall be used, spaced not less than 18-inches on enters. Insulation may be applied to flat sheets and formed with

the metal in the brake. Lined duct shall be increased in outside dimension to allow for thickness of lining material.

AUTOMATIC TEMPERATURE CONTROL SYSTEMS A. Complete systems of automatic controls shall be provided for the sys-

tems of air conditioning, heating and ventilating. B. All disconnects, wiring and conduit, including low voltage wiring and conduit and other items so indicated on the drawings, will be furnished and installed by the Electrical Contractor. Controls shall be Honeywell, or equal. The installation shall be supervised by the controls

A. The Contractor shall test and make tight all work, furnishing all equipment and paying all costs of replacing and repairing any damage resulting from tests.

B. The system shall be free of objectionable noise and vibration: C. All tests shall be made in the presence of the Architect.

D. Systems shall be tested for the even destribution of heating and cool-

manufacturer or his representative.

DATE: PRINTS ISSUED FOR:

5.10.85 BOARD APPROVAL

5.20.85 OSA

5.23.85 BIDDING

ing and the proper functioning of controls and equipment. E. All systems shall be adjusted and tested by this Contractor prior to final inspection by the Architect, or his representative. Tests on equipment must be made under operating weather conditions, for both heating and cooling cycles, and regardless of the date of completion of the installation of the system, the Contractor for this work shall supply qualified workmen, equipment, instruments and the like, to adjust and place in satisfactory operation all heating and air conditioning. Tests of heating equipment shall be made under heating weather conditions and tests of cooling equipment under cooling weather

F. <u>Ventilating and Air Conditioning Systems</u>: After completion of the work, test and regulate all ventilating and air conditioning systems to conform to air volumes indicated on drawings. All tests and adjustments in apparatus and ducts for securing proper volumes and face distribution of air for each grille, register, ceiling outlet, shall be made by the Contractor. Where required or directed by the Architect fans shall be provided with larger or smaller pulleys, at no

MARK DATE

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additional cost, necessary to drive fans at the speeds necessary to give the indicated volumes. Furnish, to the Architect, 5 copies of a written air balance report showing all required and actual air quantities and the running amps of all motors.

A. Painting will be done under other Sections of the Specifications; how-

ing of damaged snop finishes shall be done by this Contractor.

A. The Contractor shall provide complete sets of printed operating in-

ever, this Contractor shall provide all necessary information and assistance for proper identification of piping and equipment. Repaint-

structions for each system involved. The Contractor shall also start

up and operate the systems and provide personal operating and main-

tenance instructions to the operator who will be determined by the

ontrol diagrams for the operation of the equipment and systems.

All work must conform to the requirements which fall within

the scope of the regulations in the Codes or under the

A. The California Administrative Code, Titles 19 thru 25.

B. The National Electric Code as applicable under current

state and local regulations, if any, (latest edition

Nothing in these Specifications, or shown on the plans,

shall relieve the Contractor from full compliance with

applicable portions of any of the above regulations

pertaining to work which he is installing under this

Pay for and obtain all permits, inspection fees, etc., as

required for the completion of all work included in this

Contract. Any inspection Certificates required shall be

Before submitting his bid, the Contractor shall carefully

examine the Structural, Mechanical, Plumbing and Architectural Drawings for this work, along with the

Specifications for same in addition to the drawings and

specifications governing the work of this trade. He shall

also visit the site of the proposed construction and

familiarize himself with all the site conditions. No

subsequent allowances will be made to the Contractor

because of his negligence in complying with the above or

The Contractor shall maintain on the job a competent

foreman or a superintendent at all times to superintend the

The Contractor shall be responsible for the safety and good

condition of all materials and equipment until final

acceptance by the Owner. He shall erect and maintain

suitable barriers, protective devices, lights and warning

signs where required for the protection of the public and

employees about the buildings. He shall be fully

responsible for any loss or injury to persons or property

resulting from his neglect or the carelessness and neglect

distribution equipment and lighting fixture catalog

cuts shall be submitted for approval in seven (7)

construction without prior approval of the Architect

may be reflected and if reflected shall be removed from

the structure and replaced with approved equipment or

Upon completion of the work in this Contract, the Architect

shall be furnished with a complete set of catalog data

which describes each piece of equipment installed under

this Contract. The catalog shall be bound in a set and

shall be clearly labeled as to each item of equipment used.

The work as laid out is to some extent diagrammatic

Adhere to the location indicated as far as

equipment, devices and the like

Maintain ample head room in all rooms and

3. In the event there is interference between this

4. Verity the exact locations of all fixtures and

A. The Contractor shall, as work progresses, verify the

B. where the work requires connections to be made to

dimensions of the spaces available for the installation

of the work and he shall assume full responsibility for

the proper locations and grading of each portion

equipment that is furnished and set in place by others,

the Contractor shall obtain exact rough-in dimensions

install the connections in a neat and workmanlike

from the manufacturer of such equipment and he shall

Should the Owner require through the Architect that any

portion of the systems or equipment herein specified be

operated prior to the final completion and acceptance of

the work, the Contractor snall consent. Such operation

snall be under the supervision and direction of the

Contractor, but all expenses therefor shall be paid by the

therefor of the Contract. Such preliminary operation, or

payment therefor, shall not be construed as an acceptance

approve any expense incurred by the Contractor before

This Contractor shall do all cutting and patching of the

work for the installation of the equipment and materials as

approved by the Architect and/or Engineer. All patching

This Contractor shall provide all foundations, supports and

hangers, etc., as required to install the equipment as

supported, braced and cross-braced in such manner as to

shall be done by this Contractor. Underground lines

cover of 24", except depth of utility services shall

barrel of the pipe. Any part of the trench excavated

below grade shall be corrected with thoroughly

outside the buildings shall be installed with a minimum

omply with respective utility company requirements.

even to afford bearing for the full length of the

When the bottom uncovered at subgrade is soft and, in

the opinion of the Architect, cannot support the

conduit, a further depth shall be excavated and

refilled to pipe foundation grade as required by the

specified or shown on the drawings. All equipment shall be

A. Excavating required for the installation of the work

B. The conduit shall be laid on firm soil cut true and

compacted material approved by the Architect.

DRAWN CHOICE

DATE 5.10.85

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CHECK'D MM

shall accurately match the adjoining work.

prevent sway and/or lateral movement.

of any of the work under the Contract, The Architect shall

Owner, separate and distinct from any money paid on account

and the location thereon indicated may be approximate

only. The Contractor, therefore, shall install all the

equipment, apparatus, conduit runs and the like as

passageways, clearance around all apparatus and

equipment and under pipe lines for unrestricted

passage and for easy servicing of all apparatus,

Contractor's work and the work of other trades,

the Contractor may move or offset the work of any

of the trades if specifically approved by the

other apparatus or devices as indicated on the

drawings. In the event these drawings do not

sufficiently indicate the locations for all such

fixtures, apparatus or devices, the Contractor

shall obtain the exact locations from the

A. Shop drawings of power and signal service and

material at the Contractor's expense.,

CATALOG DATA AND OPERATING INSTRUCTIONS

B. Equipment or material furnished or incorporated in

his alleged inability to understand the requirements.

jurisdiction of any of the governing bodies listed.

FOR ELECTRICAL WORK

ORDINANCES, REGULATIONS AND CODES

USPS. In addition to the above, the Contractor shall provide complete

manner approved by the Architect. F. Electrical conduit shall not be run in excavations provided for plumbing or heating pipes, unless separated by a minimum of 12 inches. G. Excavations for concrete encased ducts, shall be backfilled with sand, having the proper moisture content, around ducts and tamped with a pneumatic tamper. Sand fill may be terminated six inches (6") minimum above ducts and any additional fill required may be made as provided under supparagraph d.

D. Trenches and other excavations shall be backfilled in

electrical conduits occur.

No excavation below the level or, or adjacent to,

six inch (6") layers of dampened earth, each layer

tamped in a manner approved by the Architect, to the

density of the surrounding undisturbed earth. Any

surplus excavation resulting from these excavations

Architect. Puddling will not be permitted where

shall be distributed over the site as directed by the

foundations of footings small be made except in a

CLEANING UP

A. The Contractor shall keep the premises free from accumulations of his waste material or rubbish. At the completion of the work, he shall remove all his rubbish, tools, scaffolding and surplus materials from

and about the buildings, leaving the premises in a clean condition. B. All exterior surfaces of exposed equipment and material shall be thoroughly cleaned of all dirt, cement, plaster and other debris, including the exterior surtaces of all conduit, conduit fittings, conduit hangers, insulation and the like.

All surfaces to be painted shall be carefully wiped or otherwise cleaned; cracks and corners scraped out clean, grease and oil spots removed so that surfaces may receive paint without further preparation. D. All fixtures and plated materials shall be thoroughly cleaned and polished.

The Contractor shall be responsible for all damage to any part of the premises caused by breaks in conduit or fixtures furnished and/or installed by him under this specification for a period of one (1) year from date of acceptance of the project by the Owner.

SITE CONDITIONS

DAMAGE BY LEAKS

A. Where existing utilities are shown on the plans, extreme care shall be exercised in excavating near these utilities to avoid any damage thereto, and the Contractor small be held responsible for any such damage caused by this operation The general location and arrangement of piping, apparatus, etc., are shown n the drawings or herein

specified and all installations shall be made in

These utilities shall be removed or relocated as

directed by the Architect. An equitable adjustment i

the Contract will be made for the additional work

shall be suitably marked with warning signs,

accordance therewith. Information on the drawings relative to existing services is approximate only. Minor deviations required to conform to actual locations shall be made without additional cost to C. Should utilities not shown on the plans be found during excavations, the Contractor shall promptly notify the Architect for instructions as to further action. Failure to do so will make the Contractor liable for any damage there arising from his operations after discovery of such utilities not shown on the plans.

The Contractor shall use special precautions where excavations are made in the ireas near electrical jucts-since they may be high voltage jucts. All such ducts shall be exposed by careful hand excavation so as not to damage the ducts or cause injury to personnel and

barricades, etc. as required. STANDARD PRACTICE

connections to existing services.

trade. INTENT It is the intention to provide systems that are complete in every respect without further cost to the Owner. Anything not shown in drawings, or indicated in the specifications,

but required for complete operating systems shall be

included as part of this Contract. This shall include all

All work not shown in complete details shall be installed

in conformance with the best standard practice for the

Attention of Contractor is hereby called to all work covered by notes on the drawings. Work covered by notes must be furnished and installed whether it is specifically mentioned in these specifications or not.

Except as otherwise specified, all materials, apparatus and equipment furnished and installed under the Electrical Section of this specification shall be new and free from all detects. Should any trouble develop within a period of one (1) year from date of acceptance of the work, due to inferior or faulty material and/or workmanship, the trouble snall be corrected and material and equipment replaced by

the Contractor without expense to the Owner. The location of any existing utility services shown on the

Contractor for exact location.

LIST OF MATERIALS within thirty (30) calendar days after the award of the Contract, the Contractor shall submit seven (7) copies of a complete list of materials to be installed under this Contract, giving, in the case of each item of material to be used, the name of the article. All substitutes must be

drawings is approximate and shall be enecked by this

Conditions, paragraph 6d. ACCESS OPENINGS It shall be the responsibility of the Contractor to provide sufficient and convenient access openings, panels, etc., in the building construction where required for the maintenance of, installation and/or removal of all equipment, or other items of the various systems and

approved by the Architect as stipulated in the General

PURCHASE ORDERS AND ACCEPTANCE

NOTE:

A. The Contractor shall file with the Architect two (2) certified copies of all purchase orders, for materials, equipment, appliances and rentals thereof within two (2) weeks from date of Notice to Proceed with the ontract if requested by the Architect. B. The Contractor shall file with the Architect two (2) certified copies of acceptance of purchase orders for

manufacturer, distributor or wholesale house within six (6) weeks from the date of Notice to Proceed with the Contract if requested by the Architect. C. Failure to provide same within the stipulated time shall be deemed sufficient cause for the Architect to withhold certificates of payment for work completed or materials and equipment provided by the Contractor or his subcontractors toward the completion of their Contracts.

) PROVIDE FOR AN INSPECTOR

ESPCIALLY QUALLIFIED FOR ELECTRICAL & MECHANICAL WORK

SPECIFICATIONS

NEW PORTABLE CLASSROOM

BAKERSFIELD . KERN COUNTY . CALIFORNIA

FOR BAKERSFIELD CITY SCHOOL DISTRICT.

materials, equipment, and appliances by the

CHALKBOARD AND TACKBOARD

SCOPE OF WORK

a. The work of this Section shall include all labor, material, scaffolding and appliances required to complete the work indicated on the crawings

and/or specified hereunder b. See Details ON SHEET A-4

a. Chalkboard complete with extruded aluminum trim and eraser shelf (glue-

WORK INCLUDED

All tackboard complete with extruded aluminum (glue-on-board)

. All chalkboard unit panels complete with plywood backs, extruced aluminum trim and eraser shelf (unit board) d. All tackboard unit panels complete with plywood backs and extruded

Continuous map rails over all chalkboards and tackboard. All screws, toggle colts, rawl plugs and glue for application of boards Breaking in of all chalkboard upon completion of the installation. Cleaning of all chalkboard and tackboard.

Apply a one inch (l") spot of adhesive on center line of boards at two feet (2'0") on center horizontally and clamp boards in place twenty-four (24) hours for 5'-0" or higher chalkboards.

WORK NOT INCLUDED

a. All surfaces over which chalkboard and tackboards are to be applied b. All chalkboard and tackboard which are an integral part of cabinets

SE SHEETS A-FIGA-2

a. Chalkboards shall be 4thick compressed composition board with multiple applications of mechanically applied baked on enamel. Scribo as manufactured by Betstile Manufacturing Co., or approved equal. Color as

selected by the Archtiert b. Tackboards shall be full thick vinyl covered Fireneous Samper vinyl tackboard as manufactured Contrae Grown America Color as selected by the Architect Metal Trim shall be extruded aluminum minimum of 3/32" thick, etched and anodized. Scribo as listed or approved equal.

Edge Trim: 238 for unit boards and 236 for glue-on boards. 230 (slot bottom runner at 3'-0" on center to receive map hooks).

Map Hook: 240 (at 24" on center). Cement: Waterproof cement, Bestile or approved equal. crews: Phillips oval head countersunk chrome plated screws. Size

f. Plywood shall be Hothick interior C-D grade. SUBSTITUTIONS

and spacing as detailed.

Chalkboard Equals: Weber Costello "Vitoprest", Claridge #100 or 101. Koroseal as manufactured by A.B. Boyd Co., FabricorK manufactured by Claridge Products & Equipment. d. <u>Aluminum Trim Equals</u>; Moss #3 Chalk Rail.

a. Unit Boards: Chalk and tackboards shall be glued on to plywood backing and framed with extruded aluminum channel trim as specified. The CHALK and tackboards shall be fabricated in individual panels with a maximum length of $|\mathcal{C}| - \mathcal{C}^M$ b. Glue-On Boards: Chalk and tackboards shall be glued direct to finish walls and framed with extruded aluminum angle trim as specified. The chalkboards shall have a maximum length of 12'-O". The tackboard

shall be run continuous (without divider strips) between walls and/or chalkboards as detailed. Glue shall be applied to entire back of board GENERAL REQUIREMENTS

igurement of walls.

require extensive corrections.

<u>Inspection of Surfaces</u>: Surfaces over which boards are to be applied shall be inspected and if there is a-y reason why a perfect job cannot be obtained, notify the Archtiect before proceeding with the ASTANATION Installation: All surfaces over which the boards are to be applied shall be thoroughly clean and dry before application. Boards shall be installed per manufacturer's directions at such time as directed by General Contractor. The height at which the boards are to be installed shall be verified with the Architect and Owner immediately prior to starting installation. Holes for toggle or rawl plugs shall be neatly drilled so that the trim will properly cover and that unit boards may be easily proposed and really cover and that unit boards may be easily removed and replaced without additional drilling or dis-

Cleaning and Breaking-In: The entire surface of the chalkboard shall be "chalked-in" after installation by laying a piece of first quality chalk on its side and running it over the entire surface, then erasing with a clean eraser. The chalkboard and tackboard shall be cleaned of all fingerprints, dirt, marks, etc., upon completion of the WSTANATION Shop Drawings: Five (5) copies of blueprints of shop drawings shall submitted to the Architect for approval and distribution prior to

fabrication. Additional five (5) copies may be required if shop (000)

