ST. HAROUTUNE ARMENIAN CHURCH

SOUTH MILWAUKEE, WIS.

CHURCH BUILDERS in its contract price agrees to furnish the necessary labor and material to construct the above captioned edifice:

Necessary blueprints, architectural services, supervision, excavation to proper depth, footings drain tile, concrete floor, footings basement wall 8'8" high, all necessary fol-doors as manufactured by American Fol-door, South Bend, Indiana. All basement partitions clear span pre-stressed or pre-cast concrete ceiling over basement, 2" topping over.

Water connections to present system.

Electrical fixtures, allowance of $1200, 200 amp service.

Either cedar or spruce 3" deck ceiling.

Way lite blocks or equal for interior walls.

Brick for exterior walls.

Heating of hydronic type with a 3 pump system, take care of lower level, upper level and pastors office, heating church 70 degrees when exterior is minus 20.

All necessary Oak trim, sash, doors. Corbin hardware, art glass as manufactured by Kokomo Opalescent Glass Company.

Rough grading 25' from building.

All plastic sky lights over flat section. Roofing on vaulted section to be 275# asphalt shingles, flat section to be 4-ply, gravel covered, All sheet metal, valleys, gutters, downspouts, interior stud walls to be plastered two coats over rock lath.

Exterior woodwork to have two coats of paint, color selection by owner.

Interior woodwork sand stained, and varnished.

All block walls on first floor to be painted two coats.

Asphalt tile "c" grade on both floors. Boiardi tile in narthex and toilet floor, Boiardi tile on fixture walls in toilets. Vinyl asbestos tile in kitchen.

Pews to seat 200.

Alter in ~~[illegible]~~. BRICK.

Kitchen cabinets formica top.

One coat of plastic underside of basement ceiling.

All necessary area wells.

SPECIFICATIONS

CHURCH BUILDERS, INC.

161 WEST WISCONSIN AVENUE

MILWAUKEE, WISCONSIN

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GENERAL CONDITIONS

SECTION I

1. The Contractor is to comply with all city rules and pay all city and state fees. Work, materials and construction to comply with the regulations of the Inspector of Buildings, State Building Code.

2. CONTRACTORS LIABILITY INSURANCE:

All contractors shall maintain such insurance as will protect him from claims under workmen's compensation acts, public liability and property damage and from any other claims for damages for personal injury, including death, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them. Certificates of such insurance shall be filed with the Owner, if he so requires, and shall be subject to his approval for adequacy of protection.

3. PERFORMANCE OF CONSTRUCTION:

The Contractor is to do all work necessary to the completion of his contract. He is to furnish all transportation, labor, materials, apparatus, scaffolding and utensils needed to perform his work.

4. COOPERATION:

The general contractor is to coordinate with all other contractors, if any, on the building.

5. PROTECTION:

The Contractor shall be responsible for the good condition of his work and materials, both while stored at the site and after being incorporated in the work, until such time as the work is entirely completed and accepted by the Owner.

6. FIRE INSURANCE:

The Owner shall effect and maintain fire insurance and extended insurance upon the entire structure on which the work of this contract is to be done to eighty (80%) percent of its insurable value thereof, including materials in place or to be used as a part of the permanent construction. Owner note: This insurance should be contracted at time project starts and shall include fire, wind, flood, hail, etc., insurance.

EXCAVATION - BACKFILL - GRADING

SECTION 2

1. SCOPE OF WORK:

The work under this heading consists of furnishing material and equipment and performing labor necessary to do all excavating, grading, backfilling required to permit and complete the construction of the building as shown on the Drawings, or herein specified.

2. EXCAVATION:

The Contractor is to do all necessary excavation to fully carry out the work herein described. Excavate to the size and depth indicated by the drawings. Excavations shall be cut to sufficient size to allow for form work and all installations of work to the best advantage. Footing excavations shall be cut to size and meet, as far as practicable, level on the bottom, and in all cases the trenches shall be left so that footings will rest on undisturbed soil.

The Contractor shall take every possible precaution to protect his excavations against cavings, slides, influx of water or any other cause. Soil shall be stored to be used for filling in.

The Contractor will perform all trench digging for water, sewer and storm sewer inside the building, not more than 45 feet from the building.

3. PROTECTION:

The Contractor shall keep the excavation free from water and shall protect the work from flood, and he shall remove trees and shrubs that interfere with building but not without approval of the Owner.

4. EARTH HAULING:

The Contractor is to remove all usable topsoil before excavating and stockpile it for use in landscaping after the building is completed. Surplus earth shall be used for backfill and to level the sides to grades indicated on plot plans. Not responsible for dirt to be hauled in or out.

CONCRETE WORK

SECTION 3

1. SCOPE OF THE WORK:

The work in this contract shall include the furnishing and placement of all concrete called for on the plans and as described in these specifications.

2. MATERIALS:

Portland cement shall conform to the latest "Standard" Specifications and Tests for Portland Cement of the American Society for Testing Materials.

Sand shall be washed, and of clean, hard, strong, durable grains, free from salt, loam, clay, or other impurities. Sand for concrete shall be well graded from fine to coarse.

Coarse aggregate shall consist of suitable gravel or crushed stone having clean, hard, strong, durable particles, free from clay, loam, fine sand, or dust. Stone shall be washed and uniformly graded for size. Coarse aggregate for foundation, heavy walls, etc. shall be graded from 1/2" to 1-1/2" in diameter. Aggregate for thin slabs shall not exceed 3/4" in diameter.

The water used shall be free from acids, alkali or organic matter.

3. PROPORTIONS AND MIXING:

Concrete shall be mixed in proportions as hereinafter specified, in a batch mixer or ready mixed of approved type, which will insure a uniform distribution of the materials thruout the mass.

The cement-water ratio shall be minimum possible for the type of concrete required.

4. REINFORCEMENT:

All slabs resting on earth shall be reinforced with 6" x 6" 10 ga. welded wire temperature reinforcing mesh.

5. PIPE SLEEVES, ANCHOR BOLTS, ETC:

The Contractor shall set and build in all pipe sleeves, anchor bolts, etc., called for on the plans or required for the work.

6. FORMS:

Forms shall conform accurately to the shape, line and dimensions of the concrete as indicated on the plans. Dressed lumber, plywood or steel shall be used for all concrete surfaces.

Forms shall be substantial and sufficiently tight to prevent leakage of mortar; they shall be properly braced or tied together so as to maintain position and shape.

Before depositing concrete, debris shall be removed from the form reinforcement secured, and forms and reinforcement inspected.

Forms shall be handled from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. It shall be placed as nearly as possible in its final position, to avoid rehandling or flowing.

Concrete, during and immediately after depositing, shall be thoroughly compacted and spaded by means of rods or other suitable tools.

Subgrades shall be properly moistened before placing concrete.

All floor slabs resting on grade shall be laid over a 6" bed of tamped, clean bank gravel or crushed stone.

7. PROTECTION OF GREEN CONCRETE:

Exposed surfaces of concrete, subjected to premature drying, shall be kept moist for a period of seven days.

8. CONCRETE MIX:

The following mixes are to be used for the work.

Footers, 3,000 pound per square inch compressive strength, 1 part cement, 2 parts sand, 4 parts gravel using not more than 6-1/2 gallons of water.

Slabs, walks, steps, floors, etc., 3,000 pounds per square inch compressive strength, 1 part cement, 2 parts sand, 4 parts gravel using not more than 6-1/2 gallons of water.

No mix shall contain less than 5-1/2 sacks of cement per cubic yard of concrete when in contact with the ground or less than 5 sacks when in a protected location.

9. SLABS AND FINISHES:

All concrete shall be poured monolithic and floor finishes are to be troweled with pressure to give a smooth finish.

All surfaces where asphalt tile is to be laid is to be brought to a smooth, even, level surface. All other surfaces are to be troweled with a steel trowel to a smooth surface and sloped evenly as noted. All steps and walks shall be troweled with a wood float to an even level non slip finish. Where underground heating ducts occur the concrete shall be worked around ductwork so that they are completely encased in concrete.

10. CONCRETE STEPS AND WALKS:

The Contractor is to build all exterior concrete steps and platforms indicated on Plan and 210 square feet of sidewalks which is to be 4" thick.

11. BASEMENT CEILING:

Ceiling over basement to be of Dox Plank or equal and to comply with load-bearing requirements of the state. Ceiling to unfinished Dox Plank on underside.

Joists shall consist of steel reinforced pre-stressed concrete beams of Dox Plank or equal to be surfaced with 2" of concrete reinforced with wire mesh 6" x 6" #10 wire.

MASONRY

Section 4

I. SCOPE OF THE WORK:

This contractor shall include the furnishing of all material, labor and equipment necessary for the complete installation of the masonry as shown on the plans and described in the specifications.

2. GENERAL:

All blockwork below grade, if any, shall be concrete block. All partition or backup block above grade shall be cinder or lightweight aggregate concrete block. Header block shall be used to bond brickwork to block backup.

3. MATERIALS:

Concrete masonry units, shall conform to the physical requirements (compressive, absorption and moisture content) of the local building code. In the absence of a local building code the current A.S.T.M. specifications covering the particular use or construction in which they are employed shall apply.

All masonry walls shall be true and plumb and built to the thickness and to the bond or pattern indicated on the plans. Where no bond or pattern is indicated the wall shall be laid in straight uniform courses with the units in the courses above regularly breaking joints with the courses below. All workmanship shall be of the highest grade.

Contractor shall provide and place such special units (corner blocks, door and window jamb block, fillers, veneer block, etc.) as may be required to form all corners, returns and offsets using the required shapes and sizes to work to corners and openings and maintain a proper bond throughout the length of the wall.

Where interior concrete masonry partitions meet other interior partitions or meet exterior walls, a firm mechanical bond shall be provided with masonry.

Mortar joints shall be not more than 3/8" thick with full mortar coverage on vertical and horizontal face shells. Vertical joints shall be shoved tight.

Face-shell bedding shall be used with complete coverage of face shells, Furrowing of the mortar shall not be permitted. Extruded mortar shall be cut off flush with face of wall and the joints firmly compacted after the mortar has stiffened somewhat with a rounded tool having a diameter slightly larger than the thickness of the joint (tooling of joint may be omitted where walls are to be plastered). Backfilling of foundation walls will not be permitted until first floor is in place.

In construction below grade or where walls come in contact with earth or other fill, concrete masonry shall be laid in a Portland Cement Mortar consisting of I part Portland Cement and not more than 3 parts of damp, loose mortar sand (I:3) mix to which plasticizing agents may be added.

Concrete masonry walls above grade shall be laid with Portland Cement-lime mortar consisting of I part lime putty or hydrated lime and damp, loose mortar sand equal to not more than 3 times the combined parts of cement and lime. Enough water shall be added to produce, after thorough mixing, a mortar of good working consistency.

4. STONE FACING:

The stone for facing all exterior walls is to be rock face limestone ashlar equal to stone from Fond du Lac, Lannon, or Sussex, Wisconsin; the stone shall show at least 10% rust or buff color. Heights of stone to range from 2" to 10", the length to be twice the height. All stone work to be pointed out with pecora waterproof cement or equal.

The Contractor shall do all cutting of his own work as required for the proper installation of his work as indicated on the drawings, or as is necessary for the work of various piping and other trades. The Contractor shall consult with such trades regarding the location of same. In case of his failure to leave or cut same in the proper places, this shall be done by the Contractor, at his own expense. Weep holes 3' intervals for bleeding.

After the above-mentioned work has been installed, he shall carefully fill and patch around same.

4. BRICKWORK:

This work includes the complete laying of all brick piers and bearings as indicated on the plans. All back-up brick shall be standard hard burned common brick. The contractor shall allow the sum of $_____ per thousand for furnishing to the job a dark red brick in a rough texture. Samples of the brick shall be furnished to the Owner's agent and approved by him.

Brickwork shall be laid up in full beds of cement mortar as specified with 3/8" joints struck with a round tool. Brickwork shall be built plumb, to a line and properly bonded.

All face brickwork shall be mechanically bonded to the backup with header block by means of flemish bond course every sixth course vertically.

MISCELLANEOUS IRON & STEEL

Section 5

1. SCOPE OF THE WORK:

This contract shall include the complete furnishing and installation of all miscellaneous iron and steel necessary for the completion of this work.

2. LINTELS:

This contractor shall furnish and install all lintels as called for on the plans or required for the completion of the work.

Lintels shall be of the sizes shown on the lintel schedule.

3. STRUCTURAL STEEL:

Where shown on the drawings and details furnish and install all structural steel of the sizes shown, necessary for the completion of the work.

ROOF DECK SPECIFICATIONS

Section 6

1. SCOPE:

This work to include all labor and materials required to install PetriCal Roof Deck Slabs.

2. MATERIAL:

Shall be PetriCal Roof Deck as manufactured by Fireproof Products, Inc., in the following sizes (select size): 2" or 3" thick x 32" wide x 96" length.

3. PERFORMANCE:

Structural Strength - Capable of supporting a uniform load of 225 lbs. per square foot for spans indicated.

4. NON-COMBUSTIBLE:

Shall be non-combustible in accordance with standards established by the National Board of Fire Underwriters.

5. INSULATION:

Insulation in combination with built-up roofing approved by manufacturer, shall have the following "U" value: 2" - .144 U factor; 3" - .103 U factor.

6. SOUND ABSORPTION:

Exposed under side of roof deck shall have noise reduction co-efficient of .70 or over.

7. INSTALLATION:

General - Installations to be in accordance with following specifications.

8. OVER WOOD BEAMS:

Slabs to be laid at right angles to beams. Ends to rest on center of supporting member. Butt ends to be fitted tightly. End joints of PetriCal Slabs in adjacent rows to be staggered. Nails, when used shall be 5 in number spaced on 6" centers at each crossing of slab over supporting member. 3/4" OD washers shall be used with 20d and 30d nails for 2" and 3" slabs respectively.

9. BULB-TEE SUBPURLIN

Ends of bulb tees to have minimum bearing of 1" and to be welded on both sides of tee to framing. Intermediate crossing points of bulb tee over supporting members shall be welded alternately.

Bulb tees are to be spaced accurately ( ) on centers plus or Minus ( ).

10. GROUT:

Shall be of a pourable consistency composed of one part by volume of Portland Cement to one of following - 3 parts Perlite or 4 parts stabilized Vermiculite. Grout shall completely fill area between PetriCal slabs and bulb tees and be flush with top side of roof deck slabs.

11. MATERIAL PROTECTION:

Petrical decking shall be protected from weather until installed. Care shall be taken to prevent damage while roof deck is in storage or being handled.

12. OTHER TRADES:

PetriCal decking shall be made water tight at completion of days work by application of built up roof or other means.

Wet slabs should be allowed to dry before applying built up roof.

Built up roofing to be applied over PetriCal decking according to roofing manufacturers specifications.

13. FUTURE PAINTING:

The exposed surface of PetriCal deck shall be done with non-filming paint, spray method preferred.

LATHING AND PLASTERING
Section 8

1. SCOPE OF THE WORK:

The work under this contract shall include all lathing and plastering as called for on the plans.

2. GENERAL:

All masonry walls called for in the plans as plastered shall be plastered using a 2 coat process to full 5/8" grounds. Over all stud walls and where ceilings are to be plastered use rock lath and plaster using a 2 coat process.

All plastering shall be in accordance with the best standard practices of the trade and applied by skilled workmen. All materials used shall be of the highest quality approved brands of patented plaster.

3. LATHING:

Apply over all stud walls and ceiling joist where called for on the plans rock lath with joints staggered and nailed with four lathing nails at every bearing. All pipe chases bolt heads etc. are to be covered with metal lath. Metal corner beads are to be accurately applied to all exterior corners, arch etc. tightly nailed in place.

4. PLASTERING:

This contractor shall go over all lath and masonry surfaces to be plastered and see that all grounds, lath, etc. are accurately and firmly set, plumb, straight and true.

The first coat of mortar is to be applied with such force to form a good key with the backing.

The mortar for the brown coat shall be brought to a true uniform plane within 1/8" of the finish surface with a floating rule. Not less than 12 hours shall lapse between coats of patented plaster.

The finish coat in the Sanctuary and Entry shall be a sand float finish applied straight to all grounds. All other plaster shall be a smooth skim plaster applied straight to all grounds.

5. GENERAL:

Patented plasters are to be used throughout the job and mixed and applied in accordance with the manufacturer's recommendations. Use patented plasters as manufactured by Gold Bond, U.S. Gypsum Company or approved equal.

All joints shall be allowed to dry thoroughly (minimum of 24 hours) between each application of cement.

The tape shall be covered with topping, spread evenly over and slightly beyond the tapered edge area of the board and feathered at the edges. After the previous coat is dry it shall be covered with a second coat of topping with a smooth, uniform slight crown over the joint and the edge feathered slightly beyond the preceding coat. All dimples at nail heads shall receive three coats of joint cement, or topping, applied as each coat is applied to the joints.

PERF-A-TRIM shall be finished in accordance with the manufacturer's directions.

All coats shall be sanded as necessary after each application of joint cement or topping has dried. The final coat and subsequent sanding shall leave all gypsum wall board and treated area uniformly smooth and ready to receive decoration.

Note: Sheetrock to be applied only to interior stud partitions. PetriCal utilized in ceiling.

CARPENTRY WORK

Section 9

I. SCOPE OF THE WORK:

Contractor shall include the furnishing and erection of all carpentry and millwork as shown on the drawings and as hereinafter specified and including wood joist, nailing pieces, wood strips, trusses, wood doors and frames, all rough and finished hardware, wood partitions, and any other carpentry work shown and not specified but necessary for the completion of the building.

2. GENERAL:

The Contractor shall substantially erect all work in accordance with the plans. All work shall be framed, braced and spiked or bolted in the best and strongest manner.

3. MATERIALS:

The nominal sizes of all members shall be shown on the plans.

All materials required for the work shall be the best of their respective kinds. All lumber shall be thoroughly kiln dried and protected from the weather.

4. BLOCKING:

Suitable blocking shall be placed for fastenings.

5. DOOR JAMBS:

Exterior; Exterior door jambs shall be I-3/4" x 5- 3/4" rabbetted to receive I 3/4" doors with brick mold on the outside and 2-I/2" trim on the inside.

Door jambs shall be white pine.

Interior Main Floor. All interior main floor jambs shall be I I/8" white pine with I/2" stop.

6. DOORS;

Exterior. All exterior doors are to be I-3/4" thick of the sizes and design shown on the various elevations. Flush doors are to be stock solid core flush panel exterior doors. All doors with panels are to have solid white pine stiles.

Interior. All interior doors are to be stock I-3/8" flush hollow core birch panel doors.

Where sliding doors are shown they are to be same as specified mounted on a recessed track with nylon rollers.

7. FOLDING DOORS:

Where folding doors are to be installed it shall be a folding gate, accordian type with stock plastic leather covering. Door shall be as manufactured by the American Foldoor Co. or approved equal and shall be of the sizes shown on the drawings.

8. SHELVING:

Closets are to be equipped with ponderosa pine shelves of the number indicated with steel pipe hanging rails.

9. ACCESSORIES:

Furnish and install in each lavatory and wash room the following chromium plated accessories.

1 - soap dispenser
1 - toilet paper holder to each toilet enclosure
1 - paper towel dispenser
1 - 12" x 18" mirror over lavatory

10. HARDWARE:

The contractor shall allow the sum of
($) to furnish to the job all finish hardware necessary for a complete job.

11. CAULKING:

This contractor shall furnish all labor, material and equipment necessary to caulk around all exterior window openings where same meets the masonry and around all wood door frames. Caulking compound shall be light in color, elastic and waterproof, and shall not be injurious to aluminum, and shall not stain or bleed.

ASPHALT TILE FLOORS AND APPLICATION

Section 10

1. GENERAL:

The work included under this heading shall include the complete installation of all asphalt tile floor and base as called for on the plans.

2. PREPARATION:

Over all concrete floors where asphalt tile is to be applied the entire surface shall be given 1 coat of an approved brand of sealer recommended by the manufacturer of the tile to be used.

3. ASPHALT TILE:

Over all areas noted on the plans furnish and install 1/8" thick standard 9" x 9" block asphalt tile set in mastic. All rooms shall have black borders and 4" rubber tile base where called for. Asphalt tile shall be "C" grade.

Tile used shall be as manufactured by Kentile, Armstrong Cork Co. or approved equal.

PAINTING

Section II

1. SCOPE OF THE WORK:

The work to be included in this contract shall consist of applying and furnishing of all labor and materials for a completely finished job of painting as shown and specified hereinafter.

2. EQUIPMENT:

Furnish all material, scaffolding, ladders, ropes, etc. and all labor required for the full performance of the work as herein specified or reasonably implied, and execute the work as rapidly as is consistent with good work.

3. RESPONSIBILITY:

Assume all responsibility for the work and leave the work in an approved cleanly condition. No other work shall be carried on in the building while the finishing coats are being applied.

All woodwork must be properly prepared by the carpenter before finish has begun. If the painter finds that the woodwork is not smoothly finished he shall notify the Contractor of the fact before starting work. The painter shall sandpaper any roughness that may appear before applying the first coat.

4. MATERIALS:

All paints, varnishes and stains shall be brought to the building in original packages and shall not be thinned down or otherwise adulterated.

5. WORKMANSHIP:

All knots, sappy streaks or pitch pockets shall be brushed with a coat of shellac not more than one hour previous to the application of the first coat, and all nail heads, cracks and crevices shall be thoroughly stopped with white lead putty colored to match the finishing coat.

All window frames and exterior millwork in masonry construction shall be given the first coat before being put on where practical and no painting shall be done when the woodwork is wet, either from rain or dew, or from any other cause. The painter shall, if required, make samples for approval before executing the work.

6. PAINTING:

A. Exterior

(1) Woodwork - 1 prime coat of lead and oil
1 coat gloss house paint

(2) Ironwork - 2 coats rust inhibiting paint

B. Interior

(1) Interior Doors and Trim
1 - coat stainfiller
1 - coat varnish

All paints are to be as manufactured by O'Brien, Pittsburgh Plate Glass Co., Esser, Devoe Reynolds, pratt and Lambert, Benj, Moore Co., or equal, unless otherwise noted.

PLUMBING

Section 12

1. SCOPE OF THE WORK:

The work included in this contract shall consist of all plumbing necessary to serve the fixtures shown. Provide for future connections in Kitchen.

2. SOIL AND WASTE LINES:

Install the necessary cast iron soil stacks required to care for all fixtures as shown on the plans and continue to one foot above the roof. All floor outlets for water closets shall finish at the floor levels. Closets shall be connected to soil stacks with cast iron closet bands. All soil lines for sewers outside the Building shall be terra cotta to the sewer connection.

3. JOINTS AND CONNECTIONS:

All joints in earthware pipe to have the joints between the hub and the small end of the next section completely filled with cement mortar, made of 1/2 Portland Cement and 1/2 clean sand, other joints shall be made gas tight with packed oakum and pure soft molten lead, bedded with hammer and caulking iron. The lead in each joint shall not be less than 1/2" deep in the hub of the pipe. All joints in other pipe shall be thread joints, made of red lead.

4. FLASHING:

Where soil stacks pass through the roof, they shall be flashed with 5 pound sheet lead and shall extend 10" in all directions from the pipe. Flashing shall be made watertight.

5. VENTS:

Install a 1-1/4" vent from each lavatory trap and a 1-1/2" vent from sink, bath traps, and carry above roof, and connect into nearest soil stack above level of the fixtures served by said stacks. These vent lines are to be of galvanized pipe with screw fittings.

6. SIZE OF WATER LINES:

Main line to water heater to be 1". Main line from water heater to be 3/4". Branches to Kitchen sink, 1/2" hot and cold; to lavatory 1/2" hot and cold and 1/2" cold to water closet.

7. DRAINING OF WATER LINES:

All water pipes shall extend to a point of drainage with a fall of 1/4" to 10'. Where hot and cold lines are run together they shall be run parallel.

8. CODES:

All plumbing to conform with local and state codes.

9. SEWER LINES:

All sewer lines shall be installed as to have uniform slope and sufficient grade to properly drain.

10. FIXTURES:

Men's and women's toilet room closet - Drexell 3-126.
Lavatories in women's and men's rooms - Oxford 1-125 ERS 17 x 17.
Urinal - Senator, single stall, 7-32 tank and flush type.
Drinking fountain - Clearstream 6-54.
Hot water heater - 40 gal, gas.
Sill cocks - Two (2)
Kitchen sink - per plan
Floor drain - per plan
Water softener - none

ELECTRIC WORK

Section 13

1. GENERAL CONDITIONS:

All work included under this heading shall be governed by all the General and Special Conditions of the entire operation and this contractor shall refer especially thereto.

2. DESCRIPTION OF WORK:

The work that shall be done under this specification and the accompanying drawings comprises the furnishing of all labor, materials, tools and equipment and the installation of such materials and equipment necessary to provide a complete electrical system in the Church.

The fan motor shall be wired from the sub- feeder switch at the service entrance to a fused cutout in the Furnace Room through the limit control in the furnace bonnet.

A service entrance shall be provided with main and branch switches and all feeders to panels.

Fixtures shall be furnished and installed by this contractor, of types and makes as later specified or similar in appearance and of equal quality. All fixtures shall be lamped and left in perfect operating condition.

3. CURRENT SUPPLY:

Electrical supply will be taken from the Light Company's secondary mains on a pole and will be 3 wire 115/230 volt for the main feeders to panels and 115 volt single phase for the lighting circuits.

4. SERVICE ENTRANCE:

Furnish and install a weatherproof pothead where required on a 1-1/4" conduit. Install three #2 wires to the entrance switch of 100 amps. leaving sufficient length of wire at pothead for attachments to the Light Company's service leads.

5. WIRING METHODS:

All wiring shall be installed with standard weight conduit where buried under floor, run in straight lines under or along beams or in BX cable when run concealed above the plastered ceilings.

The plans indicate the general method of installing the circuit wiring and the outlets thatare to be supplied from the circuits. Each circuit shall feed the outlets as indicated but should it become necessary to connect an outlet to a circuit other than shown, it may be done upon written permission from the Owner's agent.

BX shall be General Electric, Cresent Wire & cable or National Electric Products Company with type R. wire. Each coil of BX or cable shall bear the manufacturer's and Underwriter's labels.

Branch circuit wire may be No. 14 gauge Type R except as later specified. Splices in all wire shall be made only in boxes or cabinets, or conduiets. When a circuit run is longer than 50 feet one way No. 12 wire shall be used.

The entire system shall be thoroughly and effectively grounded in accordance with the light Company's and Underwriter's rules.

6. OUTLETS AND BOXES:

Each outlet indicated on plans shall be provided with an approved galvanized or enameled steel outlet box. Ceiling outlet and brackets generally shall have a 4" octagon box with hangers and fixtures stud. Switch and convenience outlets shall have switch box and support, and where more than one switch occurs at a location, they shall be ganged in the proper size box. Provide covers and plaster rings where required for all boxes and bushings and connectors for BX cable. Boxes shall be as made by National Electric or Steel City Electric Company. Conduiet shall be Crouse-Hinds or Appleton make.

The Owner's agent reserves the right to change the location of any outlet before same is installed without extra charge or if any outlet is located out of proper relation to beams, walls, or other building details, its location shall be corrected.

Splices in wires at fixtures may be made with solder and non-corrosive flux or with wire nuts and the splice properly taped.

All wire for fixtures shall be single conductor braid and shall conform to the specification for other wires. No wire smaller than No. I8 shall be used for fixture wires, and the two wires shall be of different color for polarity.

7. WIRE:

All wire shall be made of refined soft drawn commercially pure copper with conductivity of not less than 98%, Mathison's Standard. It shall be well annealed and properly tinned.

All wire shall be provided with rubber insulation and protective covering designed for 600 volt service and for circuit wiring shall be Type R. This insulation shall be homogenous and placed in a manner on conductor and of such thickness as required by the A.I.E.E. Standards. Feeders to panel, entrance service, and elsewhere as shown shall be Type RH. Wire shall be General Cable, National Electric Products, Cresent Wire & Cable Co. or equal.

All duplex wires shall have a protective braid over each conductor and an additional braid over both. All underground wires and wires to outside light outlets shall be an approved moisture resisting type and continuous from switch to outlet. No wire smaller than I2 B and S gauge will be allowed for light and power wiring and for all circuit runs longer than 50 ft. one way, No. I2 shall be used. No wire larger than No. I0 shall be duplexed, and all wire of No. 8 gauge or larger shall be stranded.

8. JOINTS IN WIRES:

All wire shall be continuous between outlet and outlet or from panel to first outlet. No splices will be permitted within the conduit.

Splices that become necessary in circuit work at outlets and all splices where fixture wires join branch circuit wires shall be made with solder and non-corrosive soldering flux or approved connectors, equal to Buchnan, and shall be taped with approved gum tape to a thickness exceeding the original insulation and then taped over with an approved friction tape.

9. PANELS:

Furnish and install where shown on the drawings the branch circuit distribution panel of the totally enclosed, single door safety type. It shall have three wire bus with main lugs and single pole 20 A tumbler switches in the branches with plug fuses. Panel shall be flush mounted.

The panel shall be mounted in a code gauge steel cabinet, with not less than four inch gutters. Front shall be code gauge cold rolled steel, finished with filler and lacquer or color selected by the Owner's Agent.

Panel shall be circuit breaker type as made by Frank Adams, Trumbull Electric or Cleveland Switchboard Company or equal.

10. WALL SWITCHES:

All wall switches shall be mercury toggle type switch or mechanical silent type as manufactured by Bryant, Steel City Electric or approved equal.

Furnish and install ivory bakelite switch plate for all wall switches.

11. CONVENIENCE OUTLETS:

At each wall plug receptacle outlet shown furnish and install the required duplex receptable as manufactured by Bryant, Steel City Electric or approved equal. These receptacles may be located approximately 8" from the floor. Install ivory bakelite face plates for all receptacle outlets. Floor outlets shall be Steel City Pullman pattern adjustable box with single outlet.

12. MOTOR WIRING:

Motor wiring shall be furnished and installed from the switch at the service entrance to the blower motor connecting thereto through a limit control in the furnace bonnet.

Leave the motor and controls in perfect operating condition.

Furnace will be controlled from a room thermostat located as shown and connected to the valve or other firing device through a limit control and safety pilot.

13. ORDINANCES AND CODES:

Nothing contained in these specifications or shown on the plans shall be so construed to conflict with any National Code, Municipal or State Laws or regulations or Public Service Company's rules governing the installation of any work specified herein. All such ordinances and regulations including the National Electric Code are hereby incorporated and made part of these specifications. All requirements shall be satisfied at no additional expense to the Owner by the Contractor.

14. FIXTURES:

The contractor shall furnish and install a fixture on each lighting outlet in the building. A total allowance of _____.

HYDRONIC HEATING

This contractor shall perform all labor and provide all material as specified herein for a complete heating system. This shall generally include the following: Boiler-Burner Unit, circulator, hot water specialties, baseboard radiation, copper piping, and all other work reasonably incidental to completing a first class system of heating.

Furnish and install where shown on plans baseboard radiation.
Units shall have 3/4" copper tube and aluminum fin with end caps, joining pieces, backplate through entire length of the cabinet.
Units shall have minimum capacity of 600 BTU/hr at 200° F. Average water temperature and 65° entering air temperature.
Design 70° inside 20° outside, boiler water average 220° .
Hot water specialties shall be Taco Manufacture or equal.
High head circulators application and complete with built-in over load protection.
Manual vents. --- Automatic feed valve.
Compression tank constructed for 30 PSIG pressure.

All piping in connection with the hot water heating system.
Galvenized piping from connection in domestic water line provided within boiler room to heating system.
Schedule 40 steel pipe from boiler to circulator.
Type M copper piping from circulator to heating system and return to boiler.
Copper to iron adapters where required.
Copper sweat fittings.
Make sweat connections with 50-50 solder.

Place system in operation and make all adjustments.
Make all replacements or repairs at no cost to the owner for a period of one year from date of acceptance.
Heating system to operate quietly and properly distribute and circulate hot water to all parts of the system.

HEATING WORK

Section 14

1. GENERAL CONDITIONS:

All work included under this heading shall be governed by all the General and Special Conditions of the entire operation and this Contractor shall refer especially thereto.

2. DESCRIPTION OF THE WORK:

The work that shall be included by this section of the specifications and as shown on the accompanying drawings, provides for the complete installation of a forced air heating system in the structure.

The complete system shall be tested, all required adjustments made to the air supply and turned over to the Owner in perfect operating condition.

3. FURNACE:

Furnish and install gas forced air type furnace of the capacity shown on the plans complete with blower, having capacity not less than that indicated. Furnace shall not be more than 6" in dimension larger than that shown on the plans and shall be as manufactured by Mueller, Sunbeam, Lennox, Crane, A.O. Smith, Bryant or approved by the Owner's Agent.

Furnace shall have adequate baffles properly spaced and located to provide for efficient heat transmission. The section of heavy gauge steel shall be complete with burners, thermostatic and ignition pilots, and all burners shall be connected to a manifold on which the thermostatic control valve shall be installed. Outlets of sections shall connect to the breeching through a draft diverter. Entire unit shall be enclosed in a finished casing with liner, baffles, connection to the fan and outlet to the sheet metal duct work as shown. Both connections shall be made through flexible asbestos cloth connections, or similar means to prevent the transmission of noise. The complete installation of the furnace and all piping shall conform to the local and fire underwriters codes.

BREECHING:

Connect furnaces to chimneys with Number 20 gauge black steel breeching not smaller than the combined area of the furnace outlets. Breeching shall be neatly and tightly fitted to draft diverter on the furnace outlets and to the chimney.

5. DUCTS:

Furnish and install the supply and return ducts as shown on the drawings.

All ducts shall be braced if necessary for stiffening.

Sheet metal ducts on the ceiling shall be so supported that there will be no vibrations. Gauges of ducts shall be as recommended by the A.S.H. & V.E. Guide. Bends shall be made with long radius elbows and if square turns are used turning vanes shall be installed.

Adjustable splitters and scoops shall be used at junction of branch supply ducts, operated by a quadrant and wing nut on the exterior of the duct.

Duct over 36" in width shall be braced if necessary to prevent sagging. Bracing may be 1" x 1/8" angles, or reinforced standing seams. Fan chamber, if separate from furnace casing, shall be equipped with necessary access doors to motor and filters.

6. REGISTERS AND GRILLES:

All air supply registers shall be set where directed and shall be Lima Register Co. or similar type air conditioning with damper back of register; if desired, damper may be located in the branch duct. In either case, damper must be capable of being held in any desirable location.

Return air grilles shall be of same pattern as supply grilles without damper.

Use proper transition fittings to connect the risers to the grilles and branch ducts to the trunk duct.

7. FILTERS:

Furnish and install in the fan housing on the return air side of the fan, glass wool or fireproof fiber throw-away type filters of number and size to permit a velocity through the media to accomplish adequate dirt removal. Access doors shall be provided so that the filters may be readily changed and the support shall be designed so that all the air will pass through the filters.

8. FIRE DAMPERS:

Install fire dampers to meet the requirements of NBFU. Pamphlet No. 90 where supply and return ducts pierce the furnace room wall. Doors for resetting dampers shall be readily accessible.

9. CLEANING:

At the completion of the job, contractor shall thoroughly clean the inside of the fan, furnace and ducts to remove all dust before starting the system.

Remove all rubbish and unused material from the premises.

Allequipment shall be protected during the progress of the work to prevent plaster or rubbish from entering the duct work.

10. TEMPERATURE CONTROL:

Install complete systems of temperature control in conjunction system as manufactured by Minneapolis Honeywell, Barber-Coleman, or equal make as approved by the Owner's Agent.

Acratherm or equal thermostats shall be installed where shown and connected to the oil valves of the furnace through a high limit control in the outlet duct to the furnace. Fans shall be controlled by furnacestats starting the fan motor when predetermined air temperature has been reached and stopping the motors when the temperature falls below the point.

A toggle switch with the plates marked Fan Control shall be installed near the thermostats and wired so that the fans may be operated when the heating system is not in use.

Complete wiring of these controls shall be done under this contract. Thermometers shall also be furnished and installed in the bonnets of the furnaces.

11. ADJUSTMENTS:

Make all necessary adjustments to hot air system, leaving all dampers locked in the correct position to give the amount of air noted to the various rooms, or as may be determined during the balancing of system to obtain a uniform temperature through the building.

12. SERVICE AND GUARANTEE:

This contractor shall return to the job at the request of the owner to adjust and balance the system so that all parts of the building may be heated to a temperature of 70° when the outside temperature is 0°.

LAMINATED ARCHES

Section 15

1. FABRICATION;

Structural glued laminated members shall be as furnished by Unit Structures, Inc., Peshtigo, Wis., and shall be fabricated in accordance with the Standard Specifications for Structural Glued Laminated Southern Pine adopted by the Southern Pipe Inspection Bureau, National Design Specifications, and the American Institute of Timber Construction Standards.

Fabrication shall be in accordance with the best practices, with adequate plant and equipment, and under the supervision of properly qualified personnel.

The fabricator shall provide adequate facilities and equipment so that laminations are prepared, selected, spread, laid up, clamped, and cured within the adhesive manufacturer's specified time limits. Laminations to be scarf jointed and glued end-to-end and cured to form continuous one-piece, full length laminations. Each full length lamination then to be surfaced to a uniform thickness to assure close contact of the wood surfaces.

Clamping methods shall be such that the pressure is as uniform as practicable over the whole area. Clamping may start at any point, but shall progress to an end or ends. Gluing pressure shall be at least 100-150 pounds per square inch.

2. MATERIALS:

Lumber - The laminating lumber shall be kiln dried Southern Pine, with a moisture content of 8 to 14% and of grades or combinations of grades which will provide working stresses as follows:

Stress in extreme fiber (bending)	"f"	2400 p.s.i.
Tension parallel to grain	"t"	2600 p.s.i.
Compression parallel to grain	"c"	2000 p.s.i.
Shear parallel to grain	"H"	200 p.s.i.
Compression perpendicular to grain	"Cl"	385 p.s.i.
Modulus of elasticity	"E"	1,800,000 p.s.i.

Visible outer lamination shall be selected for clearness, uniformity of grain, and other appearance characteristics (this provision required only where appearance of exposed face is important.)

Adhesives - Laminating adhesives shall comply with Federal Specifications MMM-A-125 for casein glue.

3. SHOP DRAWINGS:

The fabricator shall furnish a complete shop drawing showing necessary details and shall obtain the Architects' approval before beginning fabrication.

4. HARDWARE:

The fabricator shall furnish the connections for joining laminated members to each other and/or to their support, except for anchor bolts embedded in masonry or attached to structural steel, setting plates or items welded to structural steel.

5. APPEARANCE GRADE:

Exposed faces of members to have the following appearance grade:
Premium
1. Application - Premium appearance grade is for uses which require the finest appearance.

2. Specifications
   a. Laminations may contain the natural growth characteristics of the lumber grade.
   b. In exposed surfaces, voids which cannot be properly filled shall be replaced with clear wood inserts. This includes knot holes and loose knots in excess of 3/4" in diameter. Voids 3/4" in diameter and under shall have wood inserts or wood filler. At time of placement, insert shall be selected with special care to match grain and color. All such work shall be done by the fabricator.
   c. Soffit and face board material shall be clear and selected with reasonable care to match color and grain at scarf and edge joints.
   d. Exposed faces shall be surfaced smooth.

6. FINISHING AND SHIPPING:

Exposed faces of members to receive a following factory-applied finish Stained, Sealed and Spar Varnished.

First Coat - Stain as selected by Architect
Second Coat - Sealer
Third Coat - Spar Varnish
Arches and beams to be individually wrapped in a moisture resistant non-staining furniture wrap paper. Loaded material, including purlins, to be covered with a load wrap for protection in transit.

7. STORAGE AND ERECTION:

General contractor to store material at site in such a manner as to be protected from the weather. Roof sheathing and roofing to be applied as soon as possible after erection.

SPECIFICATIONS FOR SANFORD TRUSSES

GENERAL: Shop fabricated wood truss units using special connector plates as provided for roof and ceiling construction.

TRUSS UNITS: Trusses shall be wood frame units fastened with 20 gauge galvanized toothed gusset plates, having two 1/4 inch deep teeth per square inch of plate. (Sanford Gri-P-late)

The truss units shall be shop assembled so that the wood members have full bearing at the peak and heel joints. The toothed plates are fastened to truss members with 10 gauge, 3/8 inch diameter head, 1 1/2" long galvanized annular nails, and the truss is then passed through a press that forces the plates into the wood so that full penetration of the teeth is obtained without crushing the outer surface of the wood.

LUMBER - (TRUSS UNITS): Coast region Douglas Fir and Yellow Pine lumber shall have an allowable working stress of 1450 psi. in bending and 1200 psi. in compression shall bear the mark of a recognized grading association or agency to identify it as stress graded lumber. The 2 x 4 inch No. 1 coast region Douglas Fir members specified shall have an allowable working stress of 850 psi. in bending and 660 psi. in compression shall bear the mark of a recognized grading association or agency to identify it as a studding and blocking grade.

The size of toothed plates and spacing of nails shall be in strict compliance with the manufacturer's recommendations.