PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Underfloor radiant heating and cooling.

1.2 SUBMITTALS
A. Submit product data under provisions of Section 01 33 00 – Submittal Procedures.
B. Submit schedules of equipment, typically indicating length and number of loops, manifold, fittings and other auxiliary items required for a complete installation.

1.3 DELIVERY, STORAGE AND HANDLING
A. Deliver products to site.
B. Store and protect products.
C. Protect units from physical damage by storing in protected areas and leaving factory covers in place.

1.4 SEQUENCING AND SCHEDULING
A. Install the underfloor radiant heating and cooling within the concrete slab. Avoid damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - UNDERFLOOR RADIANT HEATING AND COOLING
A. Wirsbo
B. Watts
C. Zurn
D. or equal.

2.2 UNDERFLOOR RADIANT HEATING AND COOLING
A. Complete packaged system including under slab tubing, control panels, temperature sensor, and other accessories.
B. Tube: Tube shall be cross-linked polyethylene, rated at 180 degree F maximum working temperature, and 100 psi working pressure. The tube shall be manufactured in accordance with ASTM standard specification F876. The tube shall be of cross-linked polyethylene manufactured by the "Engel method". The tube shall have an oxygen diffusion barrier capable of limiting oxygen diffusion through the tube to no greater than 0.10 g/m3/day @ 104 degrees F water temperature. The tube dimensions shall be: 5/8-inch nominal inside diameter (3/4-inch outside diameter) in accordance with ASTM standard specification as above. The minimum bend radius for cold bending of the tube shall not be less than six times the outside diameter. Bends with a radius less than stated shall require the use of a bend support as supplied by the tube manufacturer.

C. Manifolds: Manifolds shall be of cast brass construction, manufactured of alloys to prevent dezincification, and shall have integral circuit balancing valves. Manifolds shall be able to vent air from the system, manifolds shall be provided with support brackets and tube bend supports. Manifolds shall be isolated from supply and return tubing with valves that are suitable for isolation and balancing.

D. Fittings: Fittings shall be manufactured of dezincification resistant brass. These fittings must be supplied by the tube manufacturer. The fittings shall consist of a barbed insert, a compression ring and a compression nut.

E. Supply and Return Piping to Manifolds: Piping where buried shall be Copper-gard by Ricwil piping systems and shall be metal elsewhere. Fittings shall be compatible with the piping material used.

F. Provide all accessories for a complete installation including tube, fittings, manifolds and other ancillary items as manufactured by Wirsbo Company or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hydronic radiant tubing loops shall be installed in accordance with the manufacturer's recommendations and the details as shown on the contract drawings.

B. All fitting should be accessible for maintenance. Tubing loops shall be installed without splices, as a minimum, from the point at which the tubing enters the panel to the point at which it exits the panel.

C. Installation shall follow the shop drawings for tubing layout, tube spacing, manifold configuration, manifold location and controls. All notes on the drawing shall be followed.

D. The tubing system shall be pressurized, with water or air, in accordance with applicable codes, or to a pressure of 60 psig 24 hours prior to encasement in the radiant panel. The tubing system shall remain at this pressure during the panel installation, and for a minimum of 24 hours thereafter to ensure system integrity. The contractor shall provide the water or air for the pressurization of the tubing system. The contractor assumes all liabilities for suitable safety precautions and testing, including the use of compressed air, when applicable.
E. At start-up time, the contractor shall follow the manufacturer’s recommendations for system water and temperature balancing, record balance settings at each manifold location, and deliver to the owner a complete record of these settings for inclusion in the operation and maintenance manuals.

END OF SECTION