Calculate the size service (120/208 V, Three-phase) for a welding shop that measures 35m x 25m. The service will be underground with parallel runs (2 conductors per phase) of direct buried aluminum cable configured for diagram B4-1 (Detail 2). Service equipment is rated for continuous use at 80% of maximum load. Cable is installed in a vehicular area. The following loads are to be installed:

100 kW Electric Heat

10 kW Fixed Tools (Grinders, Drill press, etc.)

4.5 kW Water Heater

50 kW Welding machines

20 kW Yard lighting

Calculate the Service demand wattage, minimum conductor ampacity, main service size, size of service conductors, minimum trench depth without protection,