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|  | **4 Install pipe work, fixtures, and appliances: traditional and new**  The individual needs to know and understand:   * The uses and limitations of the specified bending and jointing methods, materials, and fittings in order to complete a leak-free installation * The range and characteristics of bending/jointing methods, materials, and fittings * Properties of the piping material available:  for example:   + Copper   + Black mild steel and Galvanised mild steel “GMS” (no heat bending or welding)   + Press fit: stainless steel, copper, or galvanized steel   + Cast iron   + Polymer pipe   + Plastic (single or multi-layered) * The handling, cutting, bending, jointing, and forming sub-assemblies * The safe operation of the cutting, bending, threading, soldering, and testing equipment provided, according to manufacturer guidelines * The applications appropriate to:   + Pre-wall installation systems   + Surface wall installation   + Hot water installations   + Cold Water Installations   + Heating installations   + Underfloor heating   + Gas installation systems   + Wastewater systems * Systems and installation requirements to contribute to United Nations Sustainable Development Goals   + Goal 6 - Ensure access to water and sanitation for all     - Rainwater harvesting or grey water system Installation of the piping system above ground level   Installation of appliances systems that reduce water consumption and provide access to safe water, sanitation and hygiene   * + Goal 7 - Ensure access to affordable, reliable, sustainable and modern energy and Goal 13 - Take urgent action to combat climate change and its impacts     - Heat pump systems, Ground Source and Air Source (Not Refrigeration Type)     - Hybrid Heating systems for conversion of older systems   + Solar thermal hot water systems |  |
|  | The individual shall be able to:   * Read and interpret drawing for a range of systems and appliances * Interpret drawings to facilitate pipe-work fabrication and the installation of appliances * Modify the area and surfaces, as required, to permit fixing and assembly * take and transfer measurements and angles from given drawings to surfaces and piping materials * Select suitable fixing methods for the available surfaces, appliances, and environment * Fix an appropriate number and diameter of pipe brackets/clips in the correct or specified configuration * Determine the optimal way to use given materials to complete assembly and installation of systems in a sustainable manner * Install systems to ensure they provide access to safe water, sanitation and hygiene standards * Create freehand sketches for the purposes of pipe bending and assembly * Limit the generation of waste through uneconomic use of materials to aid sustainability of natural resources * Determine and use the correct positions for cutting the piping material * Measure, set out, and mark the materials and pipework * Determine the correct positions for bending the piping material * Select an appropriate and safe method for handling, cutting, installing, and jointing the piping material * Utilize the chosen method to bend the piping material safely * Utilize the chosen jointing method to form the pipe-work sub-assemblies * Install the pipework utilizing the previously fitted brackets/clips * Install sanitary fixtures * Install appliances * Connect the pipework to the appliances/utilities * Install gas, water, heating, and effluent pipe work |  |