II. Centrifugally cast (CC) GRP pipes and fittings:

a) Resin

i. Vinyl ester shall be used in the internal resin rich liner of the pipe and fittings. Isophthalic or vinyl ester shall be used in the structural wall of the pipes and fittings, as per the design application requirements. All resins shall be tested in accordance with ASTM C-581or applicable standard. Provide resin systems to the requirements of BS 3532 type-B or to applicable standard.

ii. The resin used in the liner layer will be Vinyl ester and in accordance to BS/DIN/EN 14364 shall have a Glass Transition temperature of at least 75 °C. In addition a sample shall be tested for HDT in accordance with Method A of DIN EN ISO 75 - 2.

iii. Resins shall be cured to achieve 90% of the manufacturer's recommended Barcol hardness value and may be tested by external laboratories for their authenticity of type by random sampling, during the project.

b) Additives.

i. The use of additives such as fire retardant, UV inhibitors or coloured pigments or dyes shall be subject to the approval of the Engineer and will only be approved in exceptional circumstances.

c) Aggregates and fillers.

i. Sand aggregates shall be clean, graded silica sand containing no impurities and be in accordance with BS/DIN EN 14364.

ii. Fillers (other than sand aggregates) shall be permitted in accordance to BS/DIN/ EN 14364, provided the necessity is scientifically tested, justified and approved by the Consultant and the Client on all accounts of performance, including Qualifying Tests using Long Term type tests, at minimum a of 10,000 hrs.

iii. Note: Filled pipes and fittings shall only be allowed on a project once the satisfactory Long Term test results are in hand & all conditions as stipulated above are met in advance.

d) Wall construction