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GENERAL SPECIFICATIONS FOR WATERFEATURE CONSTRUCTION

1.0 GFRC

1.1 Material
Refer to "Material specifications for artificial rock" for exact make up of GFRC panels.

1.2 Joining
GFRC panels shall be joined together utilizing 3.4lb galvanized expanded metal lath, mechanically fastened to GFRC panels. All joints shall receive a coating of mortar that will be textured to match adjacent GFRC panel surfaces.

1.3 Armature
An angle iron armature structure will be secured to existing concrete or framed structures utilizing a variety of mechanical attachments. This structure shall be used to hang and support the GFRC panels (refer to 8 1/2" x 11" attachment detail sheets.)

1.4 Attachment
Re-bar hooks, for attachment purposes, are cast/imbedded into back of GFRC panels. These hooks along with an optional "through panel" attachment will be welded to the armature structure for support of GFRC.

1.5 Concrete Backfill
The GFRC castings are to be used as the front face of retaining wall structures and shall be backfilled with concrete (as with any typical retaining wall). Concrete specification will be dependent upon structural specifications.

1.6 Color
The GFRC rock shall receive a series of acrylic based stains that will provide a naturalistic rock appearance. A high grade siloxan based sealant shall be applied over the acrylic stains for further protection against fading, discoloration and efflorescence.

2.0 WATERPROOFING

2.1 Ponds
All ponds and streams shall be waterproofed with a continuous 30 mil PVC membrane. Pipe penetrations shall be made water tight utilizing a butyl ribbon and stainless steel clamp system.

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2.2 Substructures
In applications where ponds are to be constructed on Substructures. It is recommended that a primary waterproofing system be installed on the structure that is adequate enough to handle the volume of water contained within the pond. The pond system shall also have a waterproofing system as outlined in section 2.1

2.3 Rockwalls
Waterproofing of GFRC in hollow structure applications shall be accomplished utilizing a liquid applied elastomeric or epoxy waterproofing. This coating shall be applied to the back side of the GFRC within the waterfall areas at a minimum of 2 coats.

3.0 MECHANICAL SYSTEMS

3.1 Pumps
Water mechanical system shall consist of (1) dedicated re-circulation pump and (1) dedicated filtration pump. These pumps will be either dry mount or submersible as deemed applicable. Standard voltage shall be 220 volt, single phase.

3.2 Filtration
Water filtration on smaller systems (1,000 - 10,000 gallons) shall be through a cartridge type filter. Systems in excess of 10,000 gallons or that will contain fish shall utilize a sand type filter. Typical turn over rate of filtration system will be a minimum of once every 8 hours.

3.3 Water Level Control
A constant water level within the pond shall be maintained by use of a float type water level control, to be located in the lower pond. This device will be controlled by standard water pressure. Use of electronic leveling devices are discouraged.

3.4 Overflow
A maximum water height in the lower pond shall be maintained through use of an overflow device. This device should be installed in an inconspicuous location, as far from sight of viewer as possible. In certain applications, this device will be located in a remote valve box adjacent to the lower pond.

3.5 Electrical
All pumps shall be protected through GFI circuitry. Both manual and automatic controls are recommended. If submersible pumps are used, a secondary disconnect must be installed within sight of the pump vault. Low and high pressure sensors are recommended in certain applications. State and local ordinances and codes must be considered by electrical engineer.

3.6 Water Treatment
The use of algaecides and anti-foaming agents are the recommended method for treatment of water in typical pond systems. Use of specific manufacturers should be considered when aquatic life is to be introduced to the system, some products are toxic. The use of chlorine's and acids is strongly discouraged due to their corrosive nature and adverse effects on equipment and other materials.