

A photograph of a garden pond. The pond is filled with water lilies, including large green leaves and several pink flowers. The pond is bordered by a rustic stone wall on the right side. In the background, there is a wooden bridge with a railing on the left, and various green plants and trees. A light blue banner is overlaid across the middle of the image, containing the text "Water Ponds and Features".

# Water Ponds and Features

# Ponds

- Ponds add a relaxing and peaceful aspect to the garden while attracting an abundance of wildlife such as birds, butterflies, dragon flies, frogs, lizards...

# Location, Location, Location

- Visible from the home or patio
- For most pond plants – plan for five to six hours of sun
- A way from trees—tree roots may puncture the lining or crack the concrete and the leaves cause decline in water quality and can plug up the filtering system

# Location continued

- Avoid low areas—run off from pesticides, herbicides, and fertilizer can cause problems
- Water run off can build up under the liner
- If you must build in a low area—plan to build up the sides of the pond
- Slopes are great for stream and waterfall construction.

# Inside city limits/subdivisions

- Check local codes for:
- Does it need to be fenced if so height of fence/gate access restrictions
- Depth restrictions
- Permits required

# Design

- Professionally designed and built

or

- Do it yourself

# Determine the size of the pond

Space available for the pond

Budget

Plan to build the pond large so you do not have to enlarge it next year

One lily can cover 6 to 30 square feet

Fish—Koi like a minimum of 2 feet deep and 2 feet deep deter raccoons

# Waterfall

- Height
- Width

# Pond size

- The width, height, and depth of the pond are a big consideration
- Roof liner EDPM comes in 20' width and so the maximum width would be 13 to 14 feet wide
- EDPM can be special ordered in more sizes but this may increase cost

# Stream

- Ground contour
- Slope

or

Build with pond excavating

# Filtering

- Mechanical filtering at the waterfall—may be more labor intense with weekly maintenance needs
- Skimmer –catches the leaves/debris but again may be more labor intense with daily maintenance needs

# Filtering continued

- Biofilter—back flush weekly and can be incorporated into the water fall
- UV light \$100 to \$400

# Bogs for Filtering

- Natural
- 20% to 30% of the ponds surface area
- Labor saving
- Bog plants use up the Nitrates and other nutrients which limits algae growth in the pond.

# Filtering need for Show Koi

- If planning to have a pond for show koi then the designs usually include larger filters to lessen the stress on the koi

# Pond Construction

- Pond building materials

Concrete

Gunnite

EPDM liner (most common material)

45 or 60 mil

- Preformed Ponds

# Pond Digging

- Dig by hand
- Rent a backhoe
- Hire someone else to do the digging

# Digging the Pond



# Using the Fill From Pond Hole to Build Waterfall Feature



# Padding



# Liner



# Rocks



# Waterfall and stream

- Waterfall filter box or rocks only
- 1 foot liner overlap to stream or bog
- 1 foot liner overlap from stream/bog to pond
- Sides of stream/bog must be built high enough to keep water from overflowing

# Bog

- 12 to 18 inches deep
- Many builders install pipe manifold to force water to bottom of the bog
- 1 foot liner overlap to or from the bog
- Use 3/8 minimum pea rock

# Filling the pond

- Temporary hold top overlap edge with bricks or rock
- Smooth out the liner as water fills

# Pump installation

Submersible pumps may be done before filling the pond or may be done after the pond is filled.

Raise the pump 4 to 8 inches off the bottom and install opposite from water inlets (stream/bog) to achieve best water circulation

# Size of Pump

Need to turn pond water over 1 to 2 hours—I prefer 1 hour

Pump gph (gallons per hour) are listed at 1 foot of head

So a bigger pump is needed for a higher waterfall

# Size of pipe

Install largest pipe possible to reduce friction loss

Example: 1200 gph pump

1 inch pipe—friction loss 21.75 per 100ft

2 inch pipe—friction loss 0.76 per 100 ft

# Covering Liner with rocks

- Rocks

Mortar

Stacked

if stacking foam can be used to solidify  
and then camouflaged with paint

# Rocks on Edge



# Planting the bog



# Rock stacking



# Planting Ponds

- Hardy Water Lilies

Need to repot these if they become root bound and must fertilize regularly

Pond tabs—2 tabs every 2 weeks

Agriform 10 gm 2 every month

Agriform 21 gm 1 every month

# Hardy Lilies

- Bloom during the day from about 9am to about 4 pm
- Winterizing these is easy just drop the pots to the bottom of the pond

# Tropical Plants

- Plant when the water temperature is 70 degrees.
- Fertilize same as hardy lilies
- Bloom about 8am to 8pm and there are some night blooming tropical plants that bloom from 9pm to 11am

# Tropicals and wintering

- Greenhouse
- Tank with heater 60 degree minimum
- Even in the winter some of these plants still need 10-14 hours of full spectrum lighting

# Submerged Aquatic Plants

- Provides shade, shelter, and spawning cover for fish
- Anacharis
- Hornwort
- Parrot Feather

# Floating Plants

- Water poppies
- Frog bit
- Sensitive Plant
- Snow flake
- Water hyacinth (illegal can be fined for possession in Texas)

# Bog Plants/Marginals

- Canna
  - Swap lily
  - Horsetail
  - Water mint
  - Pickerel weed
  - Lizard tail
  - Thalia best in pot in pond
- Umbrella Palm
  - Taro
  - Blackmagic Taro
  - Louisiana Iris
  - Yellow Flag Iris
  - Dwarf Cattail

# Fish

- Stocking level—1 square foot will support two inches of fish
- Feed no more than can be consumed in five minutes

# Types of Fish

- Koi
- Goldfish (several varieties)
- Shubunkin
- Rosy Reds (mosquito larvae control)
- Game fish not advisable because of disease transmission and overly aggressive

# Fish Predators

- Blue Herron (use a decoy)
- Raccoon –depth of 2 feet minimum and side walls should not be tapered so they can walk into the pond
- Snakes can eat the fish

# Finished Pond

