Terra Perma Design
permaculture education & design

Permaculture Design Process - A Lockridge CG Workshop

Permaculture emphasises the patterning of landscape, determination of function, and assembly of species. It asks where an element should be placed for maximum benefit in the system.
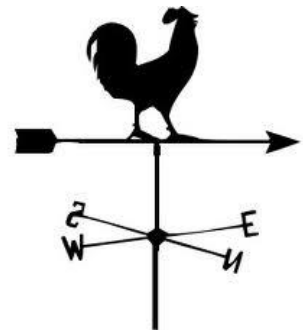
<u>Design</u>

Design is not to be confused with **technique**, which is how to do something, for example organic gardening, no dig gardening etc. Nor should it be mistaken for **strategy**, which is how and when to do something, for example crop rotation, moon planting, Fukuoka system. Design is the conceptual patterning of a multi-dimensional system and will involve many techniques and strategies as a consequence of its function.

Observation - whats already at the site & what resources are available?

Visioning - initial concepts start broad and are refined throughout the process. Start dreaming/visioning big with no restraints & go from there.

Planning - mulitple concepts & layouts.

Development - schedule & time line of stages. helps client break it down to handle each section physically & financially.

1. **Site observation and analysis -** Observe and note phenomenon. Research, collect and collate historical data such as soil and weather, land use, existing elements etc. Understand local trends and predictions. Infer and make guesses. Notice the priority requirements of the site. Choose techniques and devise a strategy. Survey site and produce map overlays for water, access, buildings topology etc.

2. **Consider element needs and functions -** Know the human, animal and plant needs of the system. See waste as a resource. Determine the functions and uses of elements required for a holistic system.

3. **Define zones, recognise patterns and guild connections -** See edge effect, stacking, guilds, ecological interactions, and land use patterns. Develop strategies for zone planning and efficient energy use. Choose the type and shape of garden beds for maximum production.

4. **Wild energy, local resources and materials -** Conduct sector analysis. Decide on the harvesting and storage of energy and water. Determine the renewable materials and energy, the embodied energy of existing on-site resources. Find other local resources and expertise.

5. **Increase biodiversity, stability and productivity -** Determine food and non-food production requirements. Plan a stable perennial food supply. Implement a soil building process through accelerated plant succession, fast carbon pathways and support species. Include integrated pest management. Harvesting and storage of food and materials.

6. **Design for catastrophe -** Account for the possibility of flooding, fire, pest plagues, climate change, severe weather, nutrient depletion and energy decline.

Designers Checklists

Use these checklists as a guide for creating your own, and review for each design to take into account location-specific information and issues

Client Interview

- Name of client (include names of all people resident or involved including children)

- Address (If client lives elsewhere, that one as well)

- Phone, fax or email numbers

- Property size

- Occupations of residents

- Lifestyle and eating habits

- Age, handicaps

- Financial situation

- On-site resources – time, skills, energy, facilities etc (natural resources see site checklist)

- Security of client (eg. mining leases, owner or renting, any mortgage)

- Legal – eg planning permission, rights of way

- Plans and drawings available

- Historical information and photographs if available or neighbours of long standing

- Known problems

- Level of food self-reliance required

- Importance of privacy

- Overall vision for site, Client's specific wants & needs

- Client's priorities

- What does the client like most about the site

- What does the client like least about the site

- Kind of design required – outline, first steps only, range of options, fully detailed design

- Addresses of local like-minded people

Questionnaire for you or a 'client'

Client: Date:

Address:

Email / Phone Number:

Resident Garden Users:

Amount of time each garden user can expect to spend tending to the garden each week:

Number of people who will benefit from the harvest of the garden:

Expected period of residence:

Soil type and any notes on prior experience with gardening in this soil:

Existing problems (noise, light, soil type, animals, pests, diseases, pollution, etc):

Positive elements that you would like to have enhanced or retained (most attractive spaces to users):

List of foods that gardeners normally eat, or would like to eat. Please include spices and oils.

List of foods that the gardeners prefer not to eat?

Favourite flowers: Favourite herbs for tea, or other medicinal uses:

Favourite plants for interest in public areas:

Favourite scents/perfumes:

Any children? Is there interest in a children's garden?

Any interest in wildlife and bird observation? Any interest in native plants?

Is there any need for outdoor workspace or any outdoor areas (such as an eating area, sitting area, games area, play area, tool storage, etc.):

Compost? Recycling facilities, and common wastes that could be used as resources:

Any interest in commercial production?

Areas for car or vehicle access?

Any interest in animals?

What sort of budget is there? What sort of materials are needed to be purchased and used for this garden?

What resources can be used to get come of these materials at a lower cost?

Client Profile

What are the usual routines of the people who will be doing the gardening?

Do you feel overwhelmed in a heavy forest and prefer open spaces? Please describe your ideal mix of these two situations. What are your favorite colours?

Do you like active surroundings or quiet reflection? Which of these areas or combination of these would cause you to interact most with your garden?

Site Survey

For a detailed site survey guide one might use the Scale of Permanency Checklist, or a summary as given below. Remember all sites are unique, it is your job as the designer to stay impartial to the client and design a permaculture system unique to that sites individual opportunities and difficulties.

- Client interview complements designer's own investigations.

- Size of site, Topography – contours, slope, key areas, aspect, shading

- Soils - type, pH, texture, drainage

- Climate – rainfall, windrose, frost pockets, etc

- Water catchment – type, quality & size, Erosion

- Water – rivers, springs, marshes, drinking troughs, taps, downpipes, sewage etc

- Aspect

- Animals – wild and domesticated

- Roads and paths, Fences

- Buildings – including potential sites for future houses and other buildings

- Energy potential – water and wind power sites etc

- Other resources available

- Potential catastrophes (eg. fire, flood, frost, lava flow, cyclones)

- Archaeological sites, Sacred sites

- Views – positive and negative

- Unusual or interesting features – cave, waterfall

- Neighbouring activities – over the fence, upstream or upwind

- Available utilities (eg power, phone, sewerage, gas)

<u>Scale of Permanence Design checklist</u>

Adapted from P.A. Yeoman's by Dave Jacke - *For smaller designs and urban sites – select those that apply.*

Climate

- plant hardiness zone

- predicted future climate change status

- annual precipitation

- seasonal distribution

- latitude

- wind directions prevailing, seasonal variations, storm wind directions

- growing degree days (important for ripening nuts)

- average frost-free dates

- chilling hours (important for fruit tree dormancy)

- extreme weather potential: drought, flood, hurricane, tornado, fire

- heating/cooling degree days

Landform

- slope (steepness, rise/run in percent)

- topographic position (i.e., mid-slope, hill crest, valley floor, etc.)

- bedrock geology: permeability, depth, nutrient content, acidity

- surficial geology: type of parent material, permeability, depth, stoniness,

- nutrient content, acidity, suitability for various uses, etc.

- estimated seasonal high water table depth

- estimated depth to bedrock, hardpan or impermeable layers of soil

- elevation

- landslide potential

Water

- existing sources of supply: location, quantity, quality, dependability, sustainability,

- network layout and features (spigots, pipes, filters, etc.)

- watershed boundaries and flow patterns: concentration and dispersion areas, including

- roof runoff patterns, gutters and down spouts

- potential pollution sources: road runoff, chemical runoff from neighbors, etc.

- flooding, ponding and puddling areas

- possible sources of supply: location, quantity, quality, dependability, sustainability, cost

- to develop

- location of all on-site and nearby off-site culverts, wells, water lines, sewage lines,

- septic systems, old wells, etc.

- erosion: existing and potential areas

Access/Circulation

- activity nodes, storage areas

- pedestrian, cart and vehicle access points, current and potential patterns

- materials flows: mulch, compost, produce, firewood, laundry, etc.

Vegetation and Wildlife

- existing plant species: locations, sizes, quantities, patterns, uses, poisonous,

- invasiveness, weediness, what they indicate about site conditions, etc.

- ecosystem architecture: layers and their density, patterning and diversity, resultant

- habitat conditions, light/shade, character, quality

- habitat types, food/water/shelter availability

Microclimate

- define various microclimate spaces

- slope aspects (direction slopes face relative to sun)

- sun/shade patterns

- cold air drainage and frost pockets

- soil moisture patterns

- precipitation patterns

- local wind patterns

Buildings and Infrastructure

- building size, shape, locations doors and windows, exist. and possible functions

- permanent pavement and snow piles from plowing it

- power lines (above and below ground) and electric outlets

- outdoor water faucet, septic system, well locations

- location of underground pipes: water and sewer line, footing drain, floor drain and down

- spout drain lines, tile drains, culverts, other

- fences and gateways

Zones of Use

- property lines, easements, rights-of-way

- existing zones of land and water use

- well protection zones, environmental and other legal limits (e.g. wetlands regulations,

- zoning regulations, building setbacks)

- current uses by neighbors and passersby

- use history and impacts on land, current or future uses

Soil Fertility and Management

- soil types: texture, structure, consistence, profile, drainage

- topsoil fertility: pH, % OM, N, P, K, Ca

- soil toxins: lead, mercury, cadmium, asbestos, etc..

- management history

- soil testing: where to get it done, how to do it

Aesthetics/Experience of Place

- outdoor rooms, walls: define spaces (walls, ceilings, floors), qualities, feelings,

- functions, features

- arrival and entry experience: sequencing, spaces, eye movements, feelings

Local Knowledge and Maps

CREATING A MAP OR PLAN

For an aerial photo in google maps you put "your address" into googlemaps, and zoom in a little on satellite view to get a4 sized screen. At that point you can either print it out or as I prefer screen capture (your browser screen of googlemaps), paste into a picture editing software program or into word, and crop out all the adds and other stuff in the screen capture but leave the scale in bottom left.

This scale is not 1:100 like you might see on normal maps but the scale stays relevant/representative as you zoom in or reduce size which is good enough to get sizes and make calculations.
This is quick and easy for initial pre-site checks or permablitz sketches etc.

Your local council should have mapping software, in this case City if Swan has -
http://maps.cityofswan.com/intramaps70/ApplicationEngine/Application.aspx?project=City%20of%20Swan&
This is far better normally, you can see the shed etc so its much more recent than googlemaps.

SOLAR PASSIVE DESIGN - Here is the link to your home technical manual -
http://www.yourhome.gov.au/technical/index.html

PLANT AND SOIL KNOWLEDGE
AGDEPT of WA - AgDept has the best local resources for WA it is just a case of finding them, their website is terrible so you need to make specific web searches including 'western australia' or 'http://www.agric.wa.gov.au' or similar terms in the search.
This link is an example 4 page pdf specifically about citrus rootstock local knowledge (essential if you want to design/advise about perth citrus systems) -
http://www.agric.wa.gov.au/objtwr/imported_assets/content/hort/fn/cp/citrusfruits/ag%20dept%20fn539%20lores.pdf

LOCAL PLANT KNOWLEDGE
We can get very worried about not knowing enough about our options in the plant systems, but, the information is avaliable at http://www.agric.wa.gov.au/PC_93769.html?s=1778649118, http://wayback.archive-it.org/1941/20100524190008/http://www.wanatca.org.au/ , etc.

As a permaculture designer you need to start understanding the ecology and patterns that govern the suitable **types and families** of plants, so you can ask the right questions and search the right local information sources.

Designing a site and system is not an easy task while this workshop was to give you an overview of how you may do it yourself the workshop was also for our Permaculture Design Course (PDC) students, who do a 72 hr, 2 week course to develop these skills specifically. So good luck and start observing.