Integrated Design Procedure

Integrated Design takes every relevant factor into account, optimizes the connections between systems, and adapts the design closely to the context for best overall, life cycle performance—ecological, economical, and social. It recognizes and enriches relationships between all elements, with a design horizon that encompasses the project, the watershed, and the global cycles to which they are connected. It is to know the story of a place, and our role in that story. In short, Integrated Design is to—

Do what makes sense in the context.

How?

- Assess context
- Get clarity on goals
- Inventory resources
- Define issues
- Creatively use resources to address issues
- Have fun doing it

=Assess Context=

Develop and use design vision that is—
Wide angle—Take every relevant factor into consideration, e.g., water supply, water security, elevation relationships, soils, sun, regulatory environment, culture, economics, climate and microclimate, fire, flood, earthquake, landslide, high winds, slope and solar exposure, neighbor relations, etc. etc.

High resolution—Zoom at will into relevant details such as microclimate, changes in soil perk through the profile, boundaries of subwatersheds, etc. etc.

Accurate to scale—Anchor where possible with hard data, fill in with good estimates. It is better to be roughly right than precisely wrong. Put numbers in understandable formats; An ordinary car doesn't use the energy of several cyclists, it uses the energy of about 700; a column 4 abreast and half a mile long.

Rewindable—What is the story of this place? Develop your ability to divine the past from it's tracks in the present. What's the geology doing? What is eroding, depositing? Where are the old landslides? What is the high water line? What plant community was here before? The languages spoken here?

Fast forwardable— What will this look like in 5, 30, 200 years? How will it fail? How can it be maintained? Who will do it? What is the ultimate disposition of the materials? Run a simulation in your mind on every single scenario you consider, checking against reality and refining your simulations as the system you went with ages over time.

X-Ray vision—To hidden qualities. What is happening underground? Inside the system? Picture it in your mind's eye. Books, classes, internet etc. are great, but your own experiences and senses are the best data stream. Vision is 10% data, 40% post-processing, 50% corrolation with memory; can consciously practice and improve these brain visual processing firmware extensions to see hidden processes.

=Get clarity on goals=

Clarity on goals and context is key— Who are the stakeholders? How will they change over time? What is the culture? How much are they willing to adjust behavior? Changes in goals and behavior have the greatest cost/benefit ratio and can have huge effects on the design. How much do they want to have to conserve? What is the Perfection standard? Hygene standard? How much Idiot proof-ness, pampered-ness, system resiliency, Self-reliance, Educational or research value, Privacy, Legal precedent, policy change, Fire safety, Earthquake safety are desired? How concerned with debt load, liability, legal compliance, resale value, quality of life and spirit?

=Inventory resources=

Who is available to help? What materials are on site? What is abundant? What is scarce?

Nature is the best inspiration for solutions.

=Define issues=

Accurate definition of the issue is key to useful action. Is the issue "Need a cistern?" or "Need dry season irrigation" or "need plants" or "need visual screen between us and the neighbors." Each of these could be a description of the same underlying issue, but each could lead to a different solution.

=Creatively use resources to address issues=

The problem is often the solution. Context is king. The main opportunities for improvement are in the connections between systems. Be realistic; it's better to aim low and hit the target. Helpful tools: Site plan, scale drawing of elevations of important water elements, etc.

=Have fun & grow while doing it=

We only have this one short life to enjoy…

Accumulated Wisdom and truisms

Ecological design, above all else, is context-specific. A change in one of any number of variables can change the whole design.
The more ecologically you live, the more illegal it is.
The map is not the terrain.
Type 1 errors: Can't fix it, only redo it completely or mitigate (e.g., house on wrong slope aspect)
If it ain't broke, don't fix it.
If you can live equally well without it, don't do it.
Don't do it until or unless it is necessary.
Do it once, or do an extremely quick draft/ test installation first, then do it once.
Always have someone involved who knows how to do the thing if anything of significance is at stake.
Wait until the design functions perfectly until building anything
Keep an eye on the bigger picture; watershed, transportation, local and regional economy
Design for future adaptability.

Defer finalizing the design until as late as possible in the building process
Always keep the whole in mind; each new element supports the new whole.
Sequence construction for maximum efficiency
Consider building in phases so the savings from ecological features can accumulate to fund the capital cost of more ecological features.
Start high in the watershed
Start at your back door
Go for the inherently most simple solution, with the best possible execution
Rain: slow it spread it sink it
Make each site it's own watershed when possible.
Minimize the square feet per person
Avoid pumps; use gravity
Site house uphill from area to be irrigated—this is basic, like facing the building south for solar heating.

Plumb everything as high as possible in elevation and conserve fall along the whole length of the pipes.

Prioritize fruit trees near the house, greywater goes to fruit trees by priority

Make all utilities accessible

Make everything serviceable

Design landscape, greywater, rainwater,

Create community Development patterns can either inhibit or contribute to the establishment of strong communities and neighborhoods. Creation of cohesive communities should be a high priority.

"The most dangerous thing we could possibly do is continue business as usual" —David Eisenberg