COLOPHON

A Manual of Living Architecture

Issued from accumulated field record and standing horticultural practice.

For use by those undertaking structures whose completion may belong to another decade.

Methods described herein concern living material; climate, soil, and site circumstance remain controlling conditions in every case.

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A Manual of Living Architecture

I. Site Before Structure

A living structure begins with its ground. Before settling the form, survey the conditions that will continue to govern it.

Water, light, and wind will act on the work for decades, along with the soil and whatever is already growing there. An error in placement remains expensive long after its original cause has been forgotten.

Water

Begin after rain, while the ground is still showing what the storm did. Standing water, fresh channels, exposed roots, washed soil, and collected leaves make drainage visible in ways dry weather cannot.

Walk the site again in another season. A hollow that appears harmless in summer may remain wet through winter; a slope that drains freely in spring may become hard and dry by late summer. Both conditions belong in the planting decision.

Surface water is only part of the survey. Dig where important trunks may stand. Persistent saturation, compacted layers, and shallow rooting can leave a tree alive without allowing it to become a dependable structural member.

Wet ground can be used where tolerant material is suitable. Willow, alder, and comparable species may perform well there; species requiring firmer footing should be placed elsewhere. Irrigation is best reserved for establishment and exceptional weather, not the indefinite correction of a poor match between plant and site.

Light

Map light in more than one season. Winter sun passing through bare branches may make a place appear open that will be deeply shaded by midsummer.

Include the future spread of existing trees. A young canopy occupies little sky; ten years later it may govern an entire planting. Note where those crowns are moving and which proposed walls, roofs, or screens depend on dense growth below them.

Shade alters form as well as vigor. Branches reach toward openings, lower growth thins, and trunks lean toward dependable light. These tendencies may supply long, supple growth, but they will not produce an even wall branching from the ground upward.

Wind

Treat wind as a continuing load. Record the ordinary prevailing direction and the places where storms accelerate through gaps, over ridges, or around buildings.

Existing trees provide the longest available record. Repeated lean, broken tops, one-sided crowns, and old scars show where exposure has already done its work. Grasses, smoke, rain, and loose leaves reveal smaller channels that may be missed on a still day.

Fresh grafts, training frames, and newly bent leaders are especially sensitive to repeated movement. Place delicate work where it can establish without being shaken loose whenever the weather changes.

Allow also for the severe afternoon that may arrive only once in twenty years. By then the structure will be larger, heavier, and carrying substantially more leaf surface than it did when the site was chosen.

Soil

A full soil analysis may be useful. Begin with a shovel.

Dig in several likely planting positions and note depth, stone, compaction, drainage, root activity, and how the soil behaves in the hand. Existing roots often disclose hard layers and wet zones more clearly than the surface does.

Then look beyond the holes. Species already prospering nearby have completed a long local trial of climate, disease, insects, drought, and soil. Their success does not qualify them for every structural purpose, but it deserves more weight than a nursery description prepared for a broad region.

Existing Growth

Clear slowly enough to recognize what is already useful. A mature tree may provide shade, shelter, an anchor point, a boundary, or one side of a room. Selective pruning may turn a thicket into a screen, while a line of young trees may already contain the beginning of a wall.

Keep enough of the site intact to continue reading it. Once the ground has been cleared and replanted, evidence about moisture, wind, browsing, and competition disappears with the vegetation that recorded it.

Movement

Allow paths to be discovered before they are formalized. Carry tools, water, stakes, and cut material through the site; visit in rain and after dark. Routes that remain convenient under those conditions will usually continue to serve.

Future maintenance requires space around trunks and unions. A passage that appears generous between saplings can become narrow once stems thicken and lower branches accumulate. Provide working room for a ladder, a pruning saw, and a person carrying something awkward.

Scale

Mark the proposed footprint at mature dimensions, then walk it before planting.

Stand where the future walls may be. Allow for trunk diameter, shoulder-height branches, access for repair, and the removal or replacement of a failed member. Dense planting gives an immediate effect, but the mature structure still requires enough ground, light, and air to remain healthy.

A First Survey

The first site record need not be elaborate. Mark slope, water, seasonal light, prevailing wind, soil character, established trees, animal pressure, paths, and likely planting zones. Date observations that may change.

Write observations in a form that can be compared. “Standing water four days after heavy rain, February” will be useful five years later; “wet ground” will not.

A sketch, a few measurements, and short dated notes are sufficient. Long projects are better served by a small record that is maintained than by a complete survey that is soon abandoned.

Trial Planting

Before committing an important area, make small trials. Plant several candidates under comparable conditions and watch them through more than one season. Compare establishment, browsing, storm damage, rooting, branching, response to pruning, and the attention each requires.

A year spent testing material is brief beside a structure expected to mature over thirty. Under uncertain conditions, a second year may cost less than a failed planting.

Placement

When placement is ready to be decided, the site will usually have narrowed the choices. Wet ground suggests one set of species, exposure another. Existing shade may serve a passage while weakening a screen. A path may belong ten feet from the place assigned to it on paper.

Use the accumulated evidence, leaving room for maintenance, replacement, and growth beyond the first drawing.

II. Species as Material

Choose species by behavior, judged at maturity.

The nursery tag gives height, spread, hardiness, and perhaps soil preference. Living architecture also asks how a stem bends, whether old wood produces new shoots, how readily a branch is

replaced, how a wound closes, how roots behave under close planting, and whether two stems will tolerate prolonged contact.

Begin the survey outside the nursery. Old hedges, abandoned orchards, stream edges, roadside plantings, parks, and neglected gardens show mature habits more reliably than young stock can.

A Working Comparison

Fast-growing trees give quick length and quick diameter. They also require frequent inspection. Ties disappear into vigorous bark, openings close, and one leader may overtake its partner in a season.

Slower trees allow a wider correction window. They extend the calendar and often reward careful early placement.

Fine-branching species suit screens and woven walls. Species that make long straight shoots are easier to use for arches, ribs, and overhead work. Trees that retain low branches can be useful at the base of walls; trees that shed them naturally are better treated as columns.

These are working tendencies rather than grades of quality. The suitable species is the one whose habits agree with the work required.

What to Look For in the Field

A mature specimen can answer several questions during one inspection.

Look at old storm wounds. Sound closure around an injury indicates useful wound response. Repeated splitting at narrow forks suggests a form that will need careful training. Long, unbroken laterals show one kind of structural promise; dense renewal from old wood shows another.

Look where branches touch. Some species remain separate for decades. Others fuse readily under pressure. Natural unions are especially useful evidence because they show what the tree does without assistance.

Look at the base. Surface roots, suckering, buttress development, and the spread of neighboring trunks all matter when several trees are expected to occupy one architectural footprint.

Neglected specimens are especially informative because they show the tree's preferences after regular human direction has ceased.

Flexibility and Recovery

Young wood should bend through the required curve without cracking, crushing, or forming a sharp fold. A useful test needs no instrument. Bend a fresh shoot gradually and note where resistance rises.

Flexibility changes quickly with age. A species that is easy to train at one-half inch diameter may become stubborn at an inch and a half. That change determines the useful training window.

Recovery matters just as much. Remove a small lateral from a test plant and watch the response over the next season. Some trees replace growth readily near the cut. Others retreat farther than expected or produce crowded weak shoots.

Where the work depends on repeated pruning, predictable recovery is a material property of first importance.

Roots and Competition

Several trunks planted as one structure will eventually occupy one root neighborhood.

Allow for mature spread. Close planting increases competition for water, light, and nutrients, and some species accept that condition better than others. Observe old hedges and coppice stools for local evidence.

Keep principal root zones out of paths used by vehicles, repeated digging, or heavy storage. A well-trained upper structure can be weakened years later by compaction around the base.

Nearby paving, drains, walls, and foundations also belong in the species decision. Root behavior that is harmless in woodland may be unacceptable beside masonry.

Pruning Character

Old pollards and hedges provide a practical record of repeated cutting.

A tree that has been cut repeatedly for fifty years shows how it handles recurring intervention. Note the size of old wounds, the attachment of replacement shoots, cavities, decay, and whether the crown remains vigorous.

Most cuts in living architecture should be made early and kept small. A forgiving pruning character nevertheless leaves room for storms, errors, and later repair.

Joining Character

Where the design depends on living unions, test before committing the whole structure.

Plant several candidates under similar conditions. Bring paired stems into contact. Try simple sustained contact on some and approach grafts on others. Label the pairs and leave controls untouched.

After two or three growing seasons, compare swelling, continuity, bark condition, and the amount of intervention each pair required.

A local test is more reliable than a species reputation brought from another climate.

Longevity and Sequence

An arch requiring fifteen years to establish should be made from material likely to remain sound well beyond establishment.

Short-lived species still have a place. They can provide early shelter, wind protection, temporary screening, or a first framework while slower trees develop. In a long project, different species can belong to different generations.

Mixed planting also reduces dependence on a single pest or disease response. Keep the mixture legible. One species may carry the main frame, another may fill lower screens, and another may be reserved for wet ground or replacement growth.

A Small Trial Plot

Set aside a short row or cluster for comparison before planting a large structure.

Plant candidates at the same age and record the source and year. Train some, prune some, and leave some alone. Note storm damage, browsing, dieback, branching, flexibility, graft response, and the attention each required.

Several seasons will usually make the important differences plain.

Retain the species that suits the site, the intended form, and the amount of maintenance that can actually be provided.

III. The Young-Tree Window

The principal shaping of a living structure is easiest while the material is young. Stems still bend readily, cuts remain small, and a few inches of guidance may prevent years of later correction.

This useful period belongs to growth rather than to a particular age. It moves outward each season: last year’s leader may already be stiff while the current extension can still be redirected with two fingers.

Establishment

Allow newly planted material to establish before asking it to carry a difficult form. Strong extension growth, healthy foliage, and good recovery from minor pruning are better signs of readiness than the calendar.

Once growth is reliable, establish direction early. A stem that hardens several feet from its intended line can still be corrected, though the work will be heavier and the resulting curve less clean.

Pressure

Training generally requires less force than expected. Broad, distributed pressure applied over time produces the safest bends.

Cord, webbing, padded wire, stakes, wooden spacers, and light temporary frames will serve most young work. Contact surfaces must be broad enough not to cut the bark, and every restraint must remain visible for inspection.

A tie that is safe in spring may become a girdle by summer. During active growth, inspect attachment points before the material has time to disappear into the stem.

Bending

Make large curves in stages. Set a moderate bend, allow growth to continue, and advance the line later. Several light attachment points will produce a cleaner arc than one hard pull near the middle.

Treat resistance as information. Flattening, creasing, or cracking shows that the useful bend for that session has been exceeded. Release the pressure and continue another time, or select younger growth.

Some springback is normal. Where species and form permit, a temporary frame may be set slightly beyond the intended finished line. Establish the allowance by gradual testing.

New Growth

New growth is easiest to place before it hardens. During the main growing period, inspect leaders and laterals while their direction can still be changed without force.

Select shoots that serve the form, remove clear competitors while the wounds are small, and redirect useful laterals toward future crossings. Intended openings should be kept free from the beginning.

A short period of summer training may prevent the need for a saw several years later.

Stakes and Frames

Stakes establish direction and frames establish repeated geometry. Neither should be treated as permanent.

Set supports firmly enough to survive ordinary wind without rubbing the trunk, and keep the tree accessible. A frame that conceals bark, joins, and ties imposes more difficulty than its geometry warrants.

When a living member begins to hold its line, remove support by stages. Loosen one tie or release part of the frame, then watch the response for several weeks. Material that continues to move can remain supported for another season.

Spacing

Spacing that appears generous among young trees will diminish as trunks and branches mature.

Mark doorways, paths, and working clearances at their eventual dimensions. Include the room required on both sides of a wall for pruning and repair, and allow for inward thickening around arches and tunnels.

Crowding may serve a woven structure when it is deliberate. Extra permanent trees planted only to finish the appearance of the first years generally create competition and removal work later.

Ties

Use ties that can be found and inspected. Soft, broad material is preferable at the bark; thin wire must not bear directly on a growing stem.

Label any restraint expected to remain longer than one season. The installation date is enough. Old hardware becomes dangerous chiefly after it has been forgotten.

Remove each tie when its work is complete, before growth begins to make it part of the tree.

Pruning During Training

Training cuts should have a stated purpose: to remove competition with a chosen leader, clear an opening, or encourage useful replacement growth. Retain enough foliage to maintain vigor.

Judge the work by the tree's response rather than by the neatness of the first cut. Revisit the area after new growth appears and adjust according to what the plant produced.

Protection

Young structural material is vulnerable to ordinary damage. Deer, goats, rabbits, mowers, trimmers, falling branches, and foot traffic can erase several seasons of work.

Protect important leaders, grafting points, and trunks until they can withstand the risks of the site. Guards should be visible and easy to remove. Temporary wind shelter may also assist establishment if it does not create lasting shade.

Uneven Growth

Paired members seldom develop at the same rate. One side of an arch may run ahead, one trunk in a wall may dominate, or shade may hold another member back for a season or two.

Manage the imbalance through vigor, light, angle, and timing. A planned junction can wait until both sides are capable of carrying it.

Annual Work

During active growth, inspect ties, guards, new leaders, abrasion points, and temporary supports. Redirect shoots while they remain supple and remove obvious competitors while they are small.

During dormancy, review the complete line. Make planned cuts appropriate to the species, repair frames, replace worn restraints, and record decisions that will govern the next season.

This period closes by degrees, as each season adds strength and removes flexibility. How much force a mature structure later requires depends largely on the attention it received here.

IV. Geometry That Grows

Living architecture is easier to direct when its geometry remains visible through growth.

A line can wander slightly and still read as a wall. An arch can thicken and remain an arch. A circle can lose one member and still hold the shape of a room. Simple forms tolerate the variations that living material introduces.

A small working vocabulary is sufficient: line, arch, circle, grid, tunnel, dome, and room.

The Line

Mark a wall with stakes and string before planting. Walk it from both ends and from the places where it will be approached. A line

seen from a distance can absorb small irregularities; a line defining a passage needs more exact spacing.

Set the trees for mature diameter. The planting may look thin for several years. Resist filling every gap with permanent material merely to make the wall appear finished.

A line becomes architectural through repetition. Regular trunks, repeated intervals, or a consistent woven plane are enough.

The Arch

Two young stems planted opposite one another can be trained toward a shared crown. The geometry is simple and the future clearance is easy to underestimate.

Lay out the opening at mature scale. Add room for trunk thickening, low branching, and the work of pruning from both sides. Broad curves distribute strain better than abrupt bends near the base.

Where a temporary frame is used, let it describe the curve rather than carry the trees indefinitely. Several light contact points are preferable to one hard pull.

The crown may be joined, crossed, or kept as two neighboring members, depending on species and purpose.

The Circle

Lay out a circle from a fixed center point with a measured cord.

Establish the radius and mark the planting positions before digging. The same ring can become several different things over time: a row of columns, a woven enclosure, a roofed chamber, or the lower order of a dome.

Decide which of these is intended because the pruning will differ. A columnar room keeps trunks distinct. A screen encourages low lateral growth. A future dome preserves leaders capable of turning inward.

Keep entrances wider than they first appear to need. Growth gathers at edges.

The Grid

A grid is useful wherever members must cross repeatedly.

Vertical stems can be planted in regular intervals and laterals trained across them, or two ranks can be woven together from the beginning. Some crossings may remain mechanical contact points; selected crossings may become living grafts.

The strength of the grid is replaceability. A failed member can be routed around or renewed without losing the whole pattern.

Dense grids create a large inspection burden. Every crossing is a possible abrasion point, trapped-bark pocket, or future union. Use the coarsest spacing that still serves the purpose.

Tunnel: A Repeated Arch

A tunnel is formed by repeating the arch.

Establish the path first. Place paired trees at measured intervals and complete each arch as an independent unit. Later growth can connect neighboring arches along the length of the passage.

This method allows the tunnel to be extended in stages and makes a damaged bay easier to repair.

The working clearance matters as much as the finished appearance. Leave room for ladders, tools, and winter access.

Ends usually need extra pruning because light encourages vigorous growth there.

Dome: A Circle Turned Inward

A dome begins with a ring of principal stems.

As the leaders gain height, turn them gradually toward an upper ring or distributed set of junctions. Bringing every stem to one exact point produces crowding and makes later inspection difficult.

Keep the lower frame open while the crown develops. Light must reach the interior long enough to maintain useful growth at the sides.

A dome often appears dense before it becomes structurally mature. Thin with the intended interior in mind.

Room

A room may be established with relatively little enclosure.

Four or five principal trunks can establish corners. A woven section can suggest a wall without filling it. Overhead branches can define a ceiling while leaving open sky between them.

Lay out human use before adding botanical detail. Stand where a chair might go. Walk the entry. Turn with a ladder. Look through the proposed window. Mark the places where sight and movement matter.

Place the planting around these uses.

Repetition, Variation, and Scale

The geometry should remain legible without requiring mechanical uniformity.

Repeated intervals give the eye enough information to understand a structure even when individual trees lean or thicken differently. Three arches establish a pattern. Ten turn the pattern into a walk.

Variation will enter through differences in light, soil, vigor, and storm damage. The underlying geometry must be clear enough to absorb those changes.

Allowance

Show mature trunks in the working drawing rather than the dimensions of nursery stock.

Mark doorways, path widths, ladder positions, and the likely inward growth of walls and roofs. A two-inch sapling can become a foot of trunk. A decorative branch can become a shoulder-height obstruction.

Openings are maintained from the beginning. Small annual cuts preserve a doorway more cleanly than a large correction later.

Load Paths

As living geometry matures it carries increasing weight. Leaves hold rain. Fruit and snow add seasonal loads. Long branches gain leverage as they extend.

Curves, multiple members, and distributed junctions carry this change well. Important spans should have more than one route back to the ground where the design permits it.

Reserve shoots near principal members can be trained as future supports or replacements.

Marking and Mock-Up

String, stakes, measured cords, bamboo, light lath, and simple templates are enough for most layout work.

For a room or tunnel, mock up the opening at full size before planting. Walk through it. Carry tools through it. Stand inside it for a while.

Revise the temporary geometry until it serves. Corrections made after planting will require time from both the trees and the keeper.

Complex structures are combinations of these simple forms; keep the components legible and leave growth room to complete them.

V. Joining Living Members

A living join begins as a temporary arrangement in which two stems are placed together, held still, protected from damage, and allowed time to produce new tissue around the contact.

Species and diameter determine the exact method, but the order of work remains substantially the same.

Before the Join

Use healthy, actively growing material. Weak stems close wounds slowly and are poor candidates for structural unions.

Choose a junction that will remain accessible for several seasons. Avoid placing an important join inside a tight fork, against a future pruning cut, or where the completed structure will make inspection difficult.

Bring the stems into alignment before cutting anything. Their natural spring should be modest at the intended position. A graft forced together under heavy tension remains difficult to stabilize.

Method A: Sustained Contact

In species that inosculate readily, sustained contact may form the required union without cutting.

1. Bring two young stems together at the intended crossing.

2. Arrange the contact so the surfaces meet cleanly without rubbing in wind.

3. Bind or clamp the stems with broad, non-cutting material.

4. Inspect through the growing season and reset the restraint as diameter increases.

5. Leave the contact undisturbed until swelling shows that the stems are growing around one another.

The process may require several seasons. Surface swelling alone does not establish a sound union; continuity and stability must also be present.

Method B: Approach Graft

Approach grafting allows both stems to remain on their own roots while the union forms.

1. Select stems of similar diameter where practical.

2. Mark the contact faces while the stems are held in their final position.

3. On each face, remove a narrow strip of bark to expose fresh cambial tissue.

4. Match the exposed surfaces closely.

5. Bind firmly enough to prevent movement.

6. Protect the junction from drying and repeated flexing.

7. Inspect regularly until growth bridges the contact and the union remains stable when support is reduced.

Keep the wound no larger than necessary. Close, accurate contact is more useful than breadth of cut.

Restraints

Apply enough pressure to hold the work still without crushing the bark.

Soft ties, padded clamps, wrapping, and temporary braces are suitable when they can be inspected and adjusted. Thin wire directly against living bark is difficult to justify.

Every restraint has a limited working life. Rapid growth can turn safe hardware into a girdle within one season, so long-term ties should carry an installation year and remain visible.

Weaving

A wall may be woven without making a graft at every crossing.

Use young, flexible shoots and make broad turns. Pass laterals alternately across neighboring stems. Keep the pattern loose enough to allow thickening.

Review each crossing as the wall matures. Some can remain free. Some may be separated if friction develops. A few can be converted into deliberate unions where additional stiffness is useful.

Keep the weave simple enough for every crossing to remain accessible to inspection.

Braided Groups

Two or three young stems may be trained together where a thicker visual member is wanted.

Keep the arrangement loose. Tight braids create hidden surfaces, trapped bark, and pockets that are difficult to inspect once the stems enlarge.

Inspect the interior of the group with the same care given to its visible face.

Crossing Decisions

Give every crossing an intended condition.

It may stay free, remain tied for a limited period, become a graft, or end in a pruning cut. Unplanned crossings accumulate quickly

in walls and roofs and often become the least accessible points in the structure.

Mark intended junctions on the working drawing before the planting becomes dense.

Supporting a New Union

A fresh join should carry little structural demand.

Brace arches, bent leaders, and grafted crossings until the surrounding wood has thickened. Remove support gradually rather than all at once. A union that moves noticeably under ordinary wind needs more time.

Temporary braces must remain visible and removable. Hardware concealed by growth becomes part of the maintenance burden.

Signs of a Good Union

As a sound junction matures, it becomes less conspicuous. Growth thickens around the contact, bark remains healthy, movement decreases, and the two stems begin to carry load together.

Useful signs include continuous callus growth, even swelling, stable alignment, and normal vigor above the junction.

Photograph important unions from a fixed angle each year so that small changes can be compared.

Signs of Trouble

Persistent movement, cracking, darkened tissue, drying bark, trapped moisture, insect activity, and one-sided swelling deserve attention.

Release a restraint that is biting into the stem. Reduce load on a junction that is opening. Separate a crossing that is abrading rather than fusing.

Some joins fail cleanly and can be attempted again on new growth. Retain a nearby shoot until the principal union has proved sound.

After Establishment

A living joint continues to change after it has become structurally useful.

Diameter increases, load shifts, and surrounding branches alter the direction of force. Inspect principal unions as part of the annual maintenance walk, especially after storms and periods of rapid growth.

When a join has become part of the architecture, its care continues as ordinary tree care.

VI. Maintenance Over Decades

Maintenance consists chiefly of observation followed by small, timely work.

Use a schedule that can be repeated for years. A structure visited regularly will seldom require the kind of correction that begins with a chainsaw.

The Annual Walk

Begin the annual walk at a distance, where the complete form can be seen before its details take over.

Changes in lean, canopy density, symmetry, or height are easier to see from outside. Then walk the paths and inspect the places that carry the most consequence: principal trunks, arches, grafts, long horizontal members, entrances, and root zones.

Follow the same route on each inspection. Familiarity with the route makes departures from the usual condition easier to see.

Spring

Winter leaves many defects exposed.

Inspect split branches, storm-loaded arches, loose braces, displaced stakes, and damage around old unions. Check the ground for erosion or standing water that was not present in earlier years.

As growth begins, review ties and guards. Anything close in spring may be embedded by late summer.

Identify replacement shoots at the same time, marking useful ones before routine pruning removes them.

Summer

Summer work is principally the control of new growth.

Watch water stress. Maintain clear doorways and paths. Redirect vigorous leaders while they are still flexible. Thin only enough to preserve light and form.

Dense structures can shade their own interiors. Weakening lower branches, sparse leaves, and long pale shoots often indicate that light is becoming scarce. Open small channels through the canopy rather than exposing a long-shaded interior all at once.

Check woven crossings and young grafts during the period of fastest diameter growth.

Autumn

Review weight before the season of severe weather.

Long laterals, heavy fruiting branches, and dense roof growth may need reduction. Clear dead wood over paths and occupied areas. Inspect drains and low ground before seasonal rain.

Record major changes while the year's growth is still easy to compare with earlier photographs.

Winter

Dormancy makes the principal geometry easier to read.

Review overall geometry, plan pruning, repair temporary frames, replace worn restraints, and decide where the next season's training will occur.

Many species tolerate planned pruning well during dormancy, though timing should follow local arboricultural practice and the needs of the species.

Update the site record during winter. A few minutes of notes may settle questions that would otherwise require speculation years later.

A Diagnostic Table

Opening narrowing — Remove young encroaching growth; check whether the original clearance allowed enough mature diameter.

Arch sagging — Reduce distal weight; inspect crown joins and the bases of the principal stems; consider a secondary living support.

Interior thinning — Review shade and canopy density; improve light gradually.

Tie disappearing into bark — Remove or reset immediately; record any retained embedded hardware.

Graft moving in wind — Restore temporary support and reduce load until more wood has formed around the union.

Repeated dieback on one member — Check root condition, drainage, disease, and competition before retraining the top.

Soil hardening around principal trunks — Redirect traffic and relieve the cause of compaction.

Water appearing where the ground was formerly dry — Investigate drainage changes before treating symptoms in the canopy.

Pruning

Before pruning, state the reason for the cut.

Typical reasons are dead wood, damage, overload, loss of clearance, competition with a chosen leader, obstruction of light, or preparation for a replacement member.

Early cuts stay small. Preserve useful shoots near important junctions until the structure has enough redundancy elsewhere.

Large wounds should be exceptional.

Root Zone

Treat the root zone as part of the structure.

Keep heavy traffic, repeated trenching, fill soil, and storage away from principal roots. Maintain the natural root collar. Watch changes in drainage caused by new paths, neighboring construction, retaining walls, or erosion.

Root damage often appears in the crown long after the original disturbance has been forgotten. Record significant work near the structure even when no immediate damage is visible.

Storm Work

After severe weather, make the site safe first. Secure hanging branches, unstable members, and blocked access.

Once immediate hazards have been secured, inspect the damage before clearing it.

A damaged section may contain useful living material for repair. Split branches can sometimes be reduced and retained. Nearby shoots may be capable of replacing a lost rib or wall member. Hasty cleanup can remove the best repair stock.

Photograph damage before major cutting when practical.

Repairs

Repairs should remain available to inspection.

Retraining, load reduction, temporary bracing, and living replacement growth should be considered before elaborate hidden hardware. Permanent mechanical support, when necessary, belongs under competent arboricultural design and continued inspection.

Keep repairs visible until their performance has been established.

Records

A useful maintenance record may remain small.

Keep dates for major pruning, failed unions, replacement planting, disease, storm damage, hidden metal, structural support, and unusual changes in water or soil.

Fixed-point photographs are especially valuable. Take them from the same places and, when possible, in the same season.

After ten years, such a record supplies observations that memory cannot.

Regular maintenance keeps the structure legible. That, more than any single intervention, is most of the work.

VII. Designing for Succession

Living architecture is most readily preserved when succession is included in the first plan.

A tree may live for generations and still lose the branch carrying a doorway. A disease can remove one species from a mixed planting. A storm can alter a roof in an afternoon. The structure continues through replacement, adaptation, and records clear enough for another person to use.

More Than One Age

Planting everything at once creates a structure in which every principal member enters old age together.

Where the site allows it, establish younger material near important older members. These trees may remain secondary for years. Their value appears when a wall thins, an arch declines, or a principal trunk must be removed.

Succession planting need not imitate the original exactly. The replacement has to preserve the useful function and the larger form.

Temporary Trees

Fast-growing species may serve the early years well.

They may provide wind protection, temporary shade, privacy, or a first enclosure while long-lived material establishes. Their eventual removal should be part of the plan from the beginning.

A temporary tree left too long can become the largest and most difficult member of the structure. Mark its intended role in the site record.

Replacement Before Removal

A declining member often provides several years of warning.

Reduced extension growth, repeated dieback, cavities, poor leaf cover, fungal activity, or a worsening structural defect may justify beginning its successor while the old tree is still functioning.

Plant or select the replacement, give it light, and begin training it toward the required position. The old member can be reduced as the new one assumes more of the role.

This period of overlap allows the replacement to begin while the original member still performs its work.

Reserve Growth

A mature structure benefits from a limited amount of deliberate redundancy.

A secondary shoot near an important arch may become a future rib. Young stems behind a wall can replace older ones without reopening the entire boundary. A spare leader can be removed later if the principal member remains sound.

Mark reserve material clearly so that routine or overzealous pruning does not remove years of provision.

Access for the Future

Keep access to principal trunks and junctions usable.

Leave enough room to remove a failed member without destroying its neighbors. Preserve planting pockets where new trees can establish. Avoid creating an interior that can only be reached by climbing through the structure itself.

Maintenance access belongs to the architecture even when it is not apparent to visitors.

Records for Another Person

Keep the record clear enough for a competent stranger to understand the site.

Include species, planting years, important grafts, hidden hardware, principal load-bearing members, replacement trees, and any unusual intervention that would not be obvious from inspection.

Simple drawings are sufficient. Photographs with dates are often better than elaborate plans.

Write plainly. A note such as “young hornbeam behind west arch reserved as replacement” is more useful than a private symbol whose meaning disappears with its author.

Changing the Plan

Revise long projects slowly.

Before removing a large established member for a new idea, mark the proposed change and live with it. Watch the effect on light, movement, shelter, and neighboring trees. A season of observation is inexpensive beside the time required to replace mature wood.

Some parts of the original scheme will prove unnecessary. Others will become more important than expected. Keep the useful intention and let the drawing change.

Partial Loss

A mature site will contain gaps, scars, old wood, and rooms altered by growth.

Some dead or declining material can remain where it is stable and useful. It may continue to define a boundary, support habitat, or carry younger growth. Material that threatens occupied areas or principal structure should be removed with the same care given to any mature tree.

Allow the age of the structure to remain legible.

The Mature Site

After several decades, training occupies less of the calendar. Young bends have become trunks, temporary frames have gone, and some original joins can no longer be readily identified. The geometry remains, softened by ordinary growth.

The work at this stage is largely selective: preserving, lightening, replacing, admitting light, and deciding where another generation should begin.

Different parts of the site may now belong to different ages. One room may be mature while another is only being planted. A tunnel can be old at one end and young at the other. This unevenness is normal in work measured over decades.

Stewardship

The useful questions change with the age of the work. Early attention is given to the direction of growth; later attention is given to preservation, replacement, openings, and continuity.

Keep the site healthy and usable. Preserve enough young material to carry important forms forward, and leave access, records, and visible evidence of unusual interventions for the next keeper.

Living material should be allowed to show its age.

Continuity

Succession belongs in the design. Plant replacements early, retain younger growth near old structure, and allow one generation to support the next.

The work need not reach completion at a single moment.

Records and replacement growth allow the work to continue.

Afterword, C/04

At the time of writing, most of the world's population already lives in urban areas, and the proportion continues to rise.

This is not an argument against cities. Cities are efficient arrangements for many human purposes. They also place increasing numbers of people at some distance from the processes by which land, water, weather, growth, decay, and succession are ordinarily learned.

Living architecture belongs to those processes.

It asks for ground rather than platform, seasons rather than schedules, and materials that cannot be replaced merely because a newer version has become available. The work proceeds by observation, correction, and return. Some decisions will remain in place longer than the person who made them.

There is some irony in issuing such a manual during an age devoted to acceleration.

The irony does not alter the work.