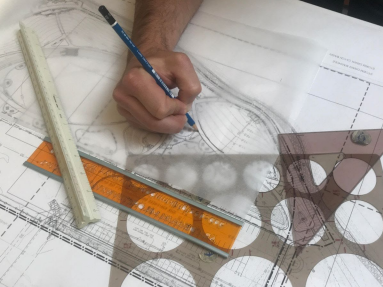
**LARE 2023 Blueprint Review**

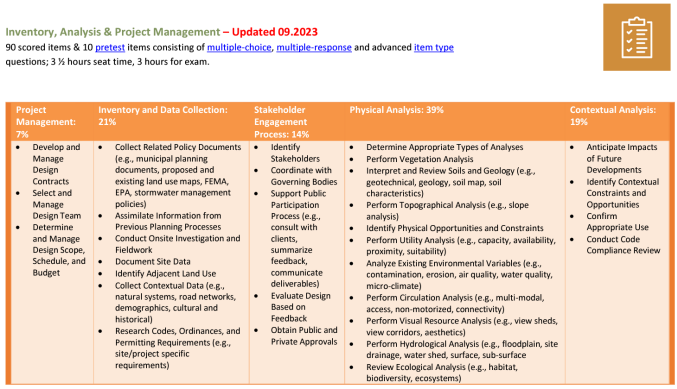
**Inventory, Analysis & Project Management **

Sarah Gronquist, ASLA

SGLA Technical Training

www.SGLATechnicalTraining.com



Inventory and Analysis Topics

1.1 Develop and Manage Design Contracts

**General Contract Method**

Owner will execute two separate contracts – one with the design team and one with the construction team. Prime Consultant manages the design work, and Prime Contractor/General Contractor manages the construction work. This is the most common form for project contracts in the public sector. Also referred to as Design-Bid-Build. Gives the Owner a clear idea of the final cost of the total project before construction begins but may take longer to complete.

**Separate Contracts Method**

Owner serves as General Contractor and has many separate contracts with designers and construction specialists. Owner is responsible for scheduling and managing the teams. Owner assumes more risk.

**Self-Performance Method**

The owner may perform some of all of the work in-house, using their own designers and installers.

**Design-Build Method**

Owner executes a single contract that includes both design and construction, to be performed by the same company. Also known as design-construct or turnkey. This format is often selected to minimize design costs and accelerate the project schedule. Hinze says these contracts may be 20-30% faster than the General Contract method.

**Professional Construction Management Method**

Owner hires a firm with construction expertise to act as their agent in managing design and construction. Construction manager may expedite scheduling by fast-tracking the project through skillful management of the various design and construction team members.

**Construction Management At Risk**

Variation on the Professional Construction Management Method that puts responsibility for completing the project on time and within budget on the Construction Manager.

Arrangements for Payment

• **Percentage of Cost Agreement:** A contract where the fee for services is based on percent of construction cost.

• **Time and Materials/Hourly/Multiple of Direct Personal Expense Agreement:** A contract where the fee for services is a direct multiple of actual costs. Best for projects that are hard to scope or may be unpredictable. Most common in private residential work, or during the initial iterative phases of Schematic Design and Planning Review. Invoices generally include backup, or a record of how each hour was spent, for client review.

• **Flat Fee Agreement, Fixed Price or Lump Sum:** A contract where the fee is fixed in advance of beginning work. Payment must be linked to contract-defined deliverables. Due to the somewhat uncertain nature of the design and construction process, this type of contract must be accompanied by a very tightly written scope of work. Best for very well defined projects. Invoicing can be simple.

• **Time and Materials with a Maximum Not to Exceed/Cap/Guaranteed Maximum Price (GMP):** Provides Owners with more security. Removes much of the potential for profit.

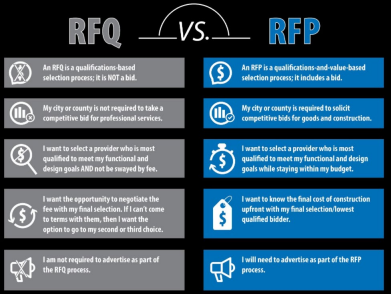
• **Cost Plus Fixed Fee:** Hourly costs plus a negotiated fixed “Profit” amount that does not vary wth actual costs. Uncommon.

*Ramroth*

Prepare RFP>proposal / RFQ>SOQ

RFQ or SOQ (Request for Qualifications or Statement of Qualifications) • Prepared by an agency or client and published or distributed to design professionals. Only requires general qualifications/experience.

• May not be project specific, or might be the first round of a project process. Can be used to develop a list of consultants who are pre-qualified for project work for a fixed amount of time (one to three years is typical) – sometimes referred to as a bench.

RFP (Request for Proposals) 

• Prepared by an agency or

client and published or

distributed to invite design

professionals to submit

proposals for their services.

• Describes the location and

scope of work for the

project.

• Requires detailed scope and

fee.



1.2 Select and Manage Design Team

Often a specific project will be pursued competitively by several firms. Each team will try to assemble the most compelling package of qualifications.

• Local experience

• Experience with similar project type, scale, or budget

• Certifications required for the specific project, such as LEED • Special Qualifications/Equal Opportunity Requirements and Certifications: These are generally set by local governments or agencies as goals for the Contract.

• LBE (Local Business Enterprise)

• MBE (Minority Business Enterprise),

• WBE (Woman-owned), and DBE (Disabled or Disadvantaged). 

1.3 Determine and Manage Design Scope, Schedule, and Budget

Based on the Client’s goals, it is the responsibility of the Landscape Architect to identify the following:

• **Scope** (Services that will be needed or might be desired) • **Fee** (Associated cost, based on the firm’s staffing and billable rates)

Once this has been roughed out with the Client and the team, you can develop:

• **Schedule** (How long will it take? Also depends on staffing, but also on critical path milestones, City board meeting dates, funding deadlines, etc).

*Scope and Fee are two sides of the same coin.*

*If one changes, the other should change.*

**

LARE Steps in the Design Process?





Scope and Fee



2.1 Collect Related Policy Documents (eg municipal planning documents, proposed and existing land use maps, FEMA, EPA, stormwater management policies)

A partial list of permits and approvals you 

might be required to secure:

• **Environmental Impact Report** (EIR) – any

project requiring Federal review

• **Parcel Map Approval:** For new

subdivisions only. Does the new plat map

meet City planning and engineering

standards? Density standards in Zoning

code?

• **Planning/Design Review:** Does this project

meet the city’s zoning and planning

standards? Will it look nice from the

street? Parking, signage, architectural

style, fence heights and style, tree

removal/replacement, emergency and

trash access, stormwater filtration,

setbacks/density

• **Building Permit:** Ensures compliance with

the Building Code

• **SWPPP Permits:** Required before

construction. Control

erosion/sedimentation during

construction.

• **Occupancy Permit:** Required at the end of

construction before the Owner can occupy

the site. All code issues resolved to get this

permit. 

Planning 101

• **Police Power** – The right of government to establish 

laws to preserve order and promote public health,

safety, morals and general welfare. Examples: Stop

signs, zoning regulations

• **Corporate Power** – The right of the government to act

as a person in making plans and spending money for

the common good

Landowner rights, within the local planning legal

framework. The rights typically granted to landowners

are sometimes called ‘a bundle of rights’.

• Quiet enjoyment of the property

• Occupy the property and exclude others

• Sell, lease, donate or bequeath the property

• Subdivide or build or remove improvements

• Control the property’s use within the law

• Other rights that can be kept or sold such as mineral

rights or development rights



Comprehensive Plans

A Comprehensive Plan consists of a statement of development policies for a city or region and includes diagrams and text setting forth objectives, principles, standards, and plan proposals. The Comprehensive Plan sets the general direction, and then over time, the City’s staff translates this direction into the zoning and building codes that govern our work as designers.

This concept has led to a lot of confusion among test candidates because while every state has a version of Comprehensive Planning, the legal requirements and terminology vary greatly from state to state.

• California state law requires a **General Plan.**

• New Hampshire requires a **Comprehensive Plan** at the regional level and a **Master Plan** at the municipality level.

• South Carolina and Louisiana do not require **Comprehensive Plans** at all, but provide model language and assistance for municipalities that want to develop them. • In Canada, you may be familiar with **Official Community Plans (OCP)** or **Municipal Development Plans**.





Neighborhood Plan for the Near Northwest Neighborhood, South Bend, Indiana



Regional Plan for the Golden Horseshoe, Ontario

*Places to Grow*

regional plan

(“provincial plan”) for

the region of Ontario

around Toronto and

Hamilton



Local Development Restrictions

The Comprehensive Plan 

guides the exercise of police

power through zoning and

subdivision regulation and the

exercise of corporate power

through the provision of capital

facilities and improvements.

*Land Use Planning, Zoning,*

*Subdivision, and Building*

*Regulations* are developed

from the Comprehensive Plan.





Zoning Map



Part of a Subdivision Plat Map



Building Codes, Regulations & Permits

• Building Code

• Plumbing Code

• Mechanical Code

• Electrical Code

• Fire Code

Most of the US and Canada has adopted the **International Building Code (IBC)**. It was a merger of several existing codes. Each state has the power to determine their prevailing building code. As of 2021, all 50 states had finally adopted the IBC.

For Landscape Architects, Building Codes typically set standards for the design and construction of:

• Walls and Steps

• Decks, Patios and Walkways • Swimming Pools and Spas • Fences, Arbors and Trellises

• Drainage Systems and Structures

• Fountains and Water Features

• Irrigation Systems

• Site Lighting

• Vehicular and Pedestrian Circulation Systems

Fascinating: https://www.iccsafe.org/wp-content/uploads/Code\_Adoption\_Maps.pdf 

Local Codes, Regulations and Permits

Regional Entities may have regulatory systems. Usually more related to planning than construction.

Cities: Cities set their 

own more demanding

codes that are responsive

to local conditions.

• Municipal Code

• Zoning Code



FEMA and the EPA

FEMA maintains flood hazard maps. 

There may also be more detailed state

maps but for insurance purposes (and

site inventory purposes) this is a good

starting place.

The EPA sets standards for clean air

and clean water. The US Army Corps is

charged with managing ‘navigable

waters’ which includes coastlines and

wetlands as well as major engineering

projects like levees and dams.



2.2 Assimilate Information from Previous Planning Processes

Review the Comprehensive Plan, any relevant Neighborhood or Regional Plans, and other documents that the city may maintain.

•Design Guidelines/Urban Plans

•Street Tree Planting Plans or Preferred Tree List

•Bicycle Planning

•Regional Transit Plans

•Standards for Public Schools



2.3. Conduct Onsite Investigation and Fieldwork

**Primary Data Collection** 

• Interviews

• Observation: windshield survey, transect, etc.

• Visit site and similar locations

• Other specialized field techniques

Some reasons for a Landscape Architect to visit a site in order to

collect data that is not readily available from maps, air photos or other remote information sources might include:

• Views

• Tree species identification and assessment of tree or vegetation health

• Identifying safe access points to the site

• Verifying the presence of unstable or poorly drained soils

• Identifying the presence of or rough limits of wetlands

• Evidence of shallow bedrock in some locations

• Individual details of hardscape conditions that may not show up on a survey

• Spirit of place

2.4 Document Site Data

Base maps generally show the following fundamental features:

• Legal conditions: property lines, easements, other

• Topography: contour lines, significant spot elevations

• Existing buildings, other structures to remain

• Proposed structures

• Existing hardscape (sidewalks, driveways, etc.)

• Significant subsurface features – underground lines, common trenches • Utility poles, boxes

• Existing trees to remain

• Other significant site features that should be protected – drainage swales, any areas to be off limits for wildlife, vegetation, or cultural protection

• If there is a common layout structure that provides coordination between the trades, that may be shown as well, ie. coordinate grid systems, station points or benchmarks.

A City or Agency client might require a ‘Basis of Design’ phase before design work begins to ensure that all site information needed has been gathered and included in the base maps.



2.5 Identify Adjacent Land Use

CLARB’s approach to designing relies heavily on the planning concept of adjacencies. Adjacency relationships among program elements will usually fall into these categories:

- Adjacency is essential - Adjacency is desirable but not essential - Adjacency is unimportant - Adjacency should be avoided

At the single family home scale, you can

consider program element adjacencies

with a simple functional analysis bubble

diagram. Common sense will get you 

through this process.

At the city scale, these considerations are

usually regulated through zoning maps. We

want to put compatible uses together and

separate incompatible uses.

Functional Analysis/Bubble Diagrams from *Basic*

*Elements of Landscape Architectural Design*, Booth



2.6 Collect Contextual Data

(eg natural systems, road networks, demographics, cultural and historical)**Use / Legal Land Descriptions**

•Land use, zoning maps – City/County planning department May show existing conditions, or allowable uses and densities •Tax Maps – Assessor’s Office

•Land Survey

Property lines

Utilities

Buildings, roads, and structures

Trees and major vegetation masses

Topography and spot elevations

•Aerial Survey: Topo, vegetation, etc. \_ less accurate than that obtained via ground survey.

•Aerial Photography

• LIDAR surveys

**Population Density and Distribution**

•US Census Bureau: Census Tract Data

•Public Health Department

•State, county, and local planning agencies

•Utility companies

•Crime statistics

**Urban Form**

•Plat map

•Aerial Photo

•USGS

•City Map / Road Map

•Figure Ground Drawing: A map showing building vs open space. Roads are not shown

**Streets, Highways, Traffic, Parking**

•Police Department accident files

•Other Transportation Agencies

•Parking Counts

•Traffic Counts, Traffic Modeling

**Infrastructure**

•Local Department of Public Works mapping

•Site Surveys

•Aerial Photos

•Historical or Archeological Surveys

•Sanborn Insurance Maps- found at city libraries and archives microfiche

•Historic USGS or other maps

•Temporal Changes in land use, environmental conditions •Utility Company and Utility Agency Mapping

**Tax and Land Value**

•Assessor’s Parcel Maps

•Lincoln Institute of Land Policy (price indexes for land and structures)



2.7 Research Codes, Ordinances &

Permitting Requirements

(eg site/project specific requirements)



Cities have many tools for controlling density, through minimum lot sizes and setback requirements. Measurements like dwelling unit/acre

(DU/acre) allow cities to permit more flexible patterns of development.

Note that the DU measurement does not include information about

building form – just density.



Alternate Patterns of Development

These site plans have the same DU/acre (0.2 DU/acre) but are arranged differently. In fact, the one on the right has been granted 2 bonus lots due to the amount of open space

that is being put under permanent protection.



3.1 Identify Stakeholders

There are several categories of stakeholders, each with a different contribution to make to the outcome of the project. You will work with your client to decide who to reach out to – and how to reach out.

**Technical Advisory Committees (TACs)**: may include City staff, organizations that will be servicing the project like trash, public transit, social workers, docents. These folks know the details that will make your project work or not work. They can also provide an early warning if there is a problem that will delay later permit review and approval.

**Specialists and Advisors:** Historians, local Chamber of Commerce, organized interest groups like bicycle advocacy, neighborhood watch, etc. provide advisory context. This group will need to be managed carefully so no one perspective dominates the project, but all have a chance to inform and participate in the process.

**General Public:** While a big part of outreach to the public is aimed at keeping them informed, for many projects you can gain valuable insight into activities and amenities that will be most valued. In extreme cases, if there is strong, organized public opposition to a project, the team should discuss finding ways to negotiate or reassure the public in order to avoid a long, drawn-out battle that may result in a failed project.



3.2 Coordinate with Governing Bodies

5 common forms of government in the US:

• **Council - Manager** An elected City Council oversees administration, makes policy and sets budget. A professional City Manager executes policy under direction of the Council. A Mayor is chosen from the council on a rotating basis.

• **Mayor – Council** Mayor is elected separately from the council and is often full-time and paid, with significant authority. The charter will define the mayor’s powers. • **Commission** Voters elect individual commissioners to a small governing board. Each commissioner is responsible for one specific aspect of government, such as fire, police, public works, health, finance. One commissioner is designated as chairman or mayor and presides over meetings.

• **Town Meeting** All voters meet to decide basic policy and elect officials to carry out the policies. Suited to small cities. About 5% of US cities. Marblehead, MA • **Representative Town Meeting** Voters select a large number of citizens to represent them at town meetings (selectmen), where only they can vote.



3.3 Support Public Participation Process (eg consult with clients, summarize feedback, communicate deliverables)

Who will use, maintain, and regulate the finished product?

• Neighbors

• Community groups

• Fire, Police departments

• Maintenance staff

• Elected officials

What are some ways you could collect their input?



3.4 Evaluate Design based on Feedback

**Integrated Project Delivery** is a collaborative approach to design and construction that involves stakeholders from the very beginning of a project.



3.5 Obtain Public and Private Approvals

A**rea variance** -most common type of variance

*Example:* Client wants to build a house on an oddly-shaped lot, that does not have a sufficient buildable envelope due to the lot configuration. A variance might be granted that permits the building to be closer to the property line than the standard setbacks would require, especially if the Comprehensive Plan is promoting infill development in that area.

**Use variance/special-use permit/conditional use -** an owner wishes to build something that is not formally permitted in the zoning code, but it is found to be an acceptable exception.

*Example:* A church wishes to build in a residential neighborhood. This may be allowed as a special use in the zoning code, but would require a review process to confirm that it will not negatively impact the neighborhood.

The financial or personal situation of the applicant cannot be taken into consideration. When a variance is granted, any other property owner with similar site conditions should be able to obtain a similar variance; this criterion is often addressed by citing **precedent.**

If an owner is prevented from making full use of their property without just compensation, it results in a **‘regulatory taking’**, or a financial loss to the owner caused by poor public policy.



4.01 Determine Appropriate Types of Analysis

We are now shifting from data collection (Inventory) and moving into combining those facts into a story about our specific site, and our client’s specific goals for the site (Analysis).

You cannot perform an analysis without a point of view. Our inventory sets will be assigned values based on the program.

Example: You have a client who owns a steep, forested, north facing site. Is it a good site or a bad site? It depends on the program.

**Suitable for: Unsuitable for:**

Ski resort Big-box retail

Hiking Housing

Nature preserve



4.2 Perform Vegetation Analysis Sampling

Techniques: 

Relevé: ‘Sample stand’- soils and plants within

representative stands are

inventoried by a specialist

Quadrat sampling: Sampling within grids that 

represent the larger site

Transect sampling: Sampling along a transect line

(similar to a

section)

Aerial photography: Useful for

establishing cover but will not provide much more

information

Infrared

photography: areas where plants are producing

chlorophyll show up as dark red



4.3 Interpret and Review Soils and Geology (eg geotechnical, geology, soil map, soil characteristics)

Soils Inventory – Particle Size

Read all three axes – they should 

add up to 100%.

• A soil test indicates you have

40% clay, 10% silt, and 50% sand.

What kind of soil do you have?



Intepret Soils Test - Fertility

Minerals may be present in the 

soil but be unavailable to

plants due to the soil’s pH.

Low pH = acidic

High pH = alkaline

The widest range of nutrients

is available to plants at a

neutral pH of 7.

• N=Nitrogen

• P=Phosphorus

• K= Potassium

5-10-15 fertilizer has 5% N by

weight, 10% P, and 15% K.





4.4 Perform Topographical Analysis (eg slope analysis)

A Slope-Aspect Map 

4.5 Identify Physical Opportunities and Constraints

Site Factors that contribute to risk of fire:

• Degree of development.

• Fuel loading (type and condition of vegetative cover, forest/understory structure) • Seasonal weather patterns – rain, wind.

• Slope. Steep slopes are much higher risk due to wind acceleration and also much harder to access for fire crews.

• Aspect. Slopes that are dry, due to southern or western exposure, or that are exposed to heavy dry winds, are high risk, especially if assets are found upslope. • Accessibility to fire protection assistance (i.e., response time, availability of helispots, proximity of air tanker attack bases, availability of woods workers, etc.). • Proximity to communities or assets at risk.

• Historic fire data. State agencies keep detailed records of burn dates and areas. 

Assessing Site Risks: Landslides

**Estimation of Landslide Hazards – clues to look for on site** 

• Angle of repose – has the hillside been cut back, or natural slope?

• Type of material: most hazardous is loose granular materials

• Angle of parent material (bedrock) to slope

• Seepage of water along hill

• Colluvial soils: indicates past history of slides

• History of slope activity (recent slides)

• Structural Damage – cracks in walls and foundations

• Hummocky Topography

• Scarps and Cracks 

• Incongruent Vegetation: Patches of

Younger, Very Different Vegetation

• Broken Trees (pistol handled,

jackstrawed)

• Accumulation of Debris At

Toe of Slope

• Light Tones Along Upper Edges of

Stone Cliffs

• Changes in drainage patterns from

upslope neighbors

• Undercutting (streams, highways)



4.6 Perform Utility Analysis

(eg capacity, availability, proximity, suitability)

Different utilities have different connection and layout requirements. Wet and dry utilities are kept separate. Most wet utilities (except potable water) require positive drainage and get precedence if a conflict exists.

A Joint Trench 

consultant will help the

design team lay out all

the utilities by

researching the

vertical/horizontal

separation requirements

for each utility with the

local utility companies

and agencies.

Typical Joint Trench analysis section



4.7 Analyze Existing Environmental Variables (eg contamination, erosion, air quality, water quality, microclimate)

How to do an Environmental Site Assessment 

per ASTM E-1528

• Transaction Screen

– Site walkthrough with checklist

• Phase I Environmental Assessment 

– A more intensive assessment of

contamination hazard

• Phase II Environmental Assessment

– Includes sampling and testing of soils,

suspect liquids and groundwater



Topography and Sun

• **Sun Angle:** The 

angle formed between

sun and the earth’s

surface.

• **Ground-sun angle:**

Takes local

topography into

account.

• **Incidence/Insolati**

**on**: The density of

light hitting the

surface; amount of

radiation per area



Solar Factors: SRI

The Solar Reflectance Index (SRI.) is a more modern measure of a surface’s ability to reject solar heat.. Materials with the highest SRI values are the coolest choices for surfacing materials.

Don’t memorize numbers other than maybe the SRI limit of 29 for LEED/SITES credit. Know that **low numbers are bad.**

**Material Surface Solar Reflectance Emittance SRI**

New asphalt 0.05 0.9 0

“White” asphalt shingle 0.21 0.91 21

Red Clay Tile 0.33 0.9 36

Lt Colored Honed Limestone 0.53 0.89 62

Aged concrete 0.2-0.3 0.9 19-32

New concrete (ordinary) 0.35-0.45 0.9 38-52

Colored Concrete 0.08-0.59 0.9 1-71

New white PCC\* 0.7-0.8 0.9 86-100

Masonry 0.9 1-65



4.8 Perform Circulation Analysis

(eg multimodal, access, non-motorized, connectivity)

Standards used

for traffic studies,

*Planning and*

*Urban Design*

*Standards*

4.9 Perform Visual Resource Analysis (eg view sheds, view corridors, aesthetics)

More recently this

type of analysis has

been performed using

Cone of Vision and

Foreground/

Middleground/

Background viewshed

analysis.

Planning and Urban Design

Standards



Visual Resource Analysis

**Class I Objective:** To preserve the existing character of the 

landscape. The level of change to the characteristic

landscape should be very low and must not attract

attention.

**Class II Objective:** To retain the existing character of the

landscape. The level of change to the characteristic

landscape should be low

**Class III Objective:** To partially retain the existing

character of the landscape. The level of change to the

characteristic landscape should be moderate.

**Class IV Objective:** To provide for management activities

which require major modification of the existing character

of the landscape. The level of change to the characteristic

landscape can be high.

This example shows a visual assessment for parkland in

Utah where there are landscape features of national

visual significance. The assessment was used to guide

placement of development to avoid degrading areas of

high visual character.



4.10 Perform Hydrological Analysis (eg floodplain, site drainage, watershed, surface, subsurface)



4.11 Review Ecological Analysis

(eg habitat, biodiversity, ecosystems)

• More biodiverse habitats are generally considered to be healthier ecosystems within habitat types (forests, meadows, grasslands, tundra, etc.)

• Presence and predominance of invasive species is an indicator of less healthy or less mature habitat types.

• Development can destroy or fragment habitats. Smaller fragments are generally able to support lesser populations of wildlife or less diverse populations of wildlife. • Removal of vegetation through logging, mining, or clearing for agricultural or other human uses can severely alter habitat suitability for both terrestrial and aquatic habitats.

• Wildfire and other catastrophic events can drastically alter ecosystems and return areas to pioneering stages in vegetation succession.

• Soil erosion severity can be impacted by removal of vegetation, winds, storm runoff, and slope steepness or slope instability.

• Pollution due to human uses can negatively impact soil health, surface and groundwater, and vegetation, wildlife, and human health.

• Rare and endangered species of plants and animals usually occupy fairly narrow ecological niches which is why they are rare and very sensitive to change in their environments.



Omernik Ecoregions

Omernik 

Ecoregions

EPA has mapped

the entire US and

categorized into

Levels I, II, III and

IV, with Level IV

the most specific

and small. Zones

are available as

GIS shapefiles or

PDFs.



Landscape Ecology

Matrix, fragmentation, patches and corridors are used to understand how much development can be permitted before an ecosystem ceases to function

The modern 

Greenway

Movement is a

result of

insights from

this discipline.



Hydrogeomorphic Classification for Wetlands

Seven classes: 

• Riverine (rivers and streams)

• Depressional (ie. vernal pools,

pocosins, etc.)

• Slope (Artesian wells, seeps,

other places where groundwater

discharges to the surface but

does not accumulate)

• Mineral Soil Flats (dry lakes, etc)

• Organic Soil Flats (peat bogs)

• Tidal Fringe (ocean edges)

• Lacustrine Fringe (lake edges)



5.1 Anticipate Impacts of Future Developments

Cities prepare Framework

Plans to anticipate future 

development.

• They build on previous

planning efforts

• Aimed at setting goals

and standards for an

area defined by a single

issue

• Intended to be flexible

over time

• Leave some areas

undefined to allow for

future decisionmaking

based on opportunities

that may arise in the

future



5.2 Identify Contextual Constraints and Opportunities

5.4 Conduct Code Compliance Review

QAQC is ‘Quality Assurance/Quality Control’ and it is shorthand for one of the Prime Consultant’s most important duties. A knowledgeable senior designer sits down with a complete set, including drawings from all disciplines, and looks for coordination errors or holes in the documents. Checking for code compliance is part of this review. Some places where these errors are often found:

• Utility lines planned in tree root zones

• Grading errors around swimming pools or accessible routes

• Power supply for irrigation

• Drainage connections for drains behind retaining walls

• Drains under play surfacing, drainlines for fountains and containers on structure • Horizontal clearances at gates, ramps, and stairs

• Egress routes from fenced areas to public streets or assembly areas

How to Study

**ORGANIZE YOUR STUDY TIME**

It is best to set up a regular study schedule. Many short sessions are better than a few cram sessions. Can you devote 2-3 hours a week to study, in 30-60 min segments? Block this time out on your calendar and make it realistic given your work and family commitments.

Figure out how many weeks you have and assign a topic or two to each week. Make a study plan.

**Each session:**

• Start with something easy and pleasant – 5-10 minutes of flashcards is a good beginning. • 30-40 minutes of reading – review CLARB’s reference books first and then our additional recommendations. Skim for graphics and vocabulary if you have a hard time focusing on reading. Try to understand concepts rather than memorizing numbers or formulas (other than the ones we’ve reviewed today).

• 10 minutes of practice exams

**Do you have exam anxiety?**

We highly recommend some regular mindfulness practice to defuse the emotional charge around this upcoming event. I have been experimenting with the online course ‘Waking Up’ but also can recommend free lectures by Tara Brach available online. Regular exercise, relaxing with your family or pets, or forest bathing may work too. Be kind to yourself and find ways to enjoy this part of your life while you are doing the work. <3



Turbocharge your effort by

forming a Study Group!

A study group needs to be organized just like any project team. Someone needs to take the lead, but there are many online resources that can make this easier. We’ve set up a Google Sheet to organize this group’s contact information. Try to find a few people whose experience is different than yours, by region or by specialization. • It is often easiest to divide into groups by time zone.

• Schedule regular meeting times. It’s okay if you can’t make every session but commit to a regular time and set up a calendar invitation so that you won’t let it slide to the bottom of your to-do list.

• For each meeting, it works well to divide your time into two or three parts. Maybe start with a review of a reference document, and then move on to doing practice tests. Don’t worry about perfection. • Divide up time-consuming tasks like reading reference books. Take turns summarizing what you think is most important from the books on CLARBs and our list.

• Do practice exams before you meet, review them together and talk about what makes an answer right or wrong. You will learn a lot by just talking about practice questions – especially AIT questions. • Use CLARB’s online Demonstration Exam tools to do calculations and make notes during your practice sessions. Can you build comfort and speed using these tools before test day? Share tips and tricks. • Write practice questions for each other, especially if you struggle with being able to see what the purpose of a question is. Questions usually have one correct answer and several ‘distractors’ that are not quite correct. How would you write a fair but difficult question?

• Some study groups make summary sheets or flashcard decks. I have heard that the process of doing this for yourself is more valuable than just using one someone else has made. Make use of Quizlet or Anki. • Provide each other with positivity and support. Follow up after test day and encourage each other. • After test day you may find that your study cohorts become long-term friends and resources. I did. Don’t be

afraid to stay in touch and ask each other technical questions as you continue on with your career.

