

CONTENT AREA: CODES + REGULATIONS

Government + Regulatory Requirements + Permit Process

Vocabulary:

- **Zoning:** uniform standards of construction originating in NYC in 1916 to protect the health, welfare and safety of people. Regulates the use of land, light, air, and open space while protecting property values and protecting against nuisances (factories in residential areas), undesirable businesses (porn shops by schools) and dangers (hazardous chemicals in public areas).
- **Incentive Zoning:** encourages private developers to provide amenities for public use in exchange for opportunity to build larger or taller structures on a site.
- **Nonconforming Use:** building is no longer permitted by the zoning ordinance. Typically allowed to stay unless it's unsafe.
- **Conditional Use:** a building that is permitted in an area that it is not zoned for, to benefit the public (e.g.: an elementary school in a residential neighborhood)
- **Variance:** applied for by an owner on a private site to ask to deviate from an ordinance in order to avoid hardship.
- **Spot Zoning:** a change in the zoning ordinance for a particular area
- **Ordinance:** a municipal law
- **Setbacks:** required open space measured between property line and face of building. Used to preserve light, air, and spaciousness
- **Building Line:** utilized by communities principally to achieve planned street patterns. They help insure that buildings will not be erected in the bed of projected streets or of potential street widenings.
- **Easements:** legal right of government or another land owner to use one's property for a specific purpose
- **Scenic Easement:** Prevents development that upsets something scenic to the public
- **Prescriptive Code:** Building code that specifies techniques, materials and methods to be used. Cut and dry and simple to administer by the official
- **Performance Code:** Building code that describes functional requirements, but leave method to achieve decisions up to the designer.
- **Fire resistance** values for how long a separation can resist the passage of fire. Stated in terms of hours and can be increased with the use of sprinklers. (eg: walls, doors, windows, floors, etc.)
- **Flame Spread Rating/Smoke Developed Ratings** measures the amount of flame and smoke a material generates. (e.g. Carpet, fabrics, etc)
- **Area of Refuge:** a location designed to hold occupants when evacuation is not safe or possible. Has a steady supply of outside air, passive fire protection, electrical integrity/emergency lighting, two way communication/call box to 24 hr manned, or outside line

Facts/Rules:

Road/Street Design

- Roads consist of straight sections (tangents) and simple curves
 - Avoid intersections that are slightly offset (like Leiser/McGloughlin)
 - Avoid intersection where the angle of roads is less than 80°

- Cartridge Roads are loop distributor-collector drive with access to the local road
- At intersections with more than 750 cars per hour, a traffic light is required
- At intersection with more than 3,000 cars per hour, grade separation is required
 - Cloverleaf: two level interchange
 - Direct left turn: where two expressways intersect
 - Diamond: expressways intersect secondary roads
- Maximum length of a block = 1,600' (that's 8 Portland Blocks!)
- Cul-de-Sacs = 400' max w/ 80' turn around
- 2 lane highway w/ 9'-0" shoulders = 40'-0" - 42'-0"
- Typical Surface Streets
 - Made of concrete, asphalt, grave, or decomposed granite
 - Width = 11'-0" - 12'-0" wide
 - Heavy Traffic Streets = 6" concrete curb and gutter
 - Minor Streets = 4" roll curb or gravel
 - Minimum curb radii @ minor streets = 12"
 - Minimum curb radii @ major streets = 50"
 - Landscape strips = 7' w/trees or 4' wide w/ground cover

Parking Design

- Spaces are typically 9'-0" wide and 18'-0" - 20'-0" long
- Accessible spaces are minimum 8'-0" wide with access alley 5'-0" wide for cars or 8'-0" wide for vans adjacent to the space
- Allow 290 sf / car when designing a lot
- Plan for 3,000 - 4,000 sf of parking for every 1,000 sf of shopping space
 - Clearance between cars = 20"
 - Circulation Aisle = 12'-0" wide
 - In lots with attendants = 8' x 18' stalls and 20' aisles
- Angle of parking affects projection and bay width of double loaded aisle:
 - 30° parking = 15'-7" projection = 43'-2" bay width
 - 35° parking = 16'-7" projection = 45'-2" bay width
 - 40° parking = 17'-6" projection = 47'-0" bay width
 - 45° parking = 18'-2" projection = 48'-4" bay width
- 90° parking is most efficient = 11 cars/100 lineal feet of curb
 - makes for easy two-way traffic and can accommodate most cars. The only disadvantage is that it can be difficult to maneuver
- 60° parking is pretty efficient = 9 cars/100 lineal feet of curb
 - Relatively economical and allows easy access to and from parking spaces
- 45° parking is pretty efficient = 8 cars/100 lineal feet of curb
 - Relatively economical and allows easy access to and from parking spaces
- 30° parking is least efficient = 5 cars/100 lineal feet of curb
 - Uneconomical.
- Slopes in parking lots should be 5% max
- In multiple story lots, ramps should be 15% max, with 8' transitions

Pedestrian Circulation

Area of a person	=	3 sf
Easy movement	=	13 sf
Crowd movement	=	7 sf
No movement	=	3 sf

Sidewalks	=	5'-0" wide min
Collector walks	=	6'-0" - 10'-0" wide min

Public Transit

- Collective Transit System: needs at least a population density of 30 persons per acre.
- Max distance to walk to a stop is 1/4 - 1/2 mile
 - Local Bus (short trips in city/long trips in burbs) = 15 - 30 mph
 - Express Bus (between medium density areas) = 40 - 60 mph
 - Rail (between areas with high density) = 40 - 70 mph

Egress Requirements

- Typical common path of travel = 75'-0" max per path
- Typical distance to an exit = 250'-0" max
- Exits cannot pass through:
 - Kitchens
 - Storerooms
 - Closets
 - (or spaces used for similar purposes)
 - Through rooms that can be locked to prevent egress
- One **Fire Tower** is required in buildings over 75'-0" (one exit, minimum)
 - Non combustible construction that is connected with mechanically vented vestibules on backup power or balconies
- Doors must swing in the direction of travel
- The number of exits is based on the number of occupants
 - Typically spaces with more than 50 occupants must have 2 exits
- Required width of exits is determined by occupants on the floor plus an allowance for occupants from floors above
- Elevators are not a means of egress
- Escalators provide a conduit for smoke and are not an approved exit
- Ramps may constitute a portion of the required legal exits
- Revolving doors must collapse to be part of required legal exit

Ventilation Systems

- Minimize the circulation of smoke by:
 - Isolating the circulation system of each fire area
 - Shifts from normal to top exhaust when there's a fire
 - Increasing air pressure to prevent flow of smoke and fumes

Standpipes

- Required for buildings with 3 or more stories
- Must be in working order during construction
- **Wet Standpipe:** continuously pressurized with water from a public supply. Hose cabinets are located at fixed distances, and hoses can be operated by occupants
- **Dry Standpipe:** not connected to a constant water supply, the firemen connect to an outside hose connection point. Cabinets are located in smoke proof stair towers and hoses are used by firemen
- **Combination:** both wet and dry. Must deliver 35 gallons/minute from each of two outlets simultaneously.

Fire Alarms

- Instal both local alarms and alarms connect to the Fire Department.
- The one to the fire department can be manual or can be through automatic fire sensors.
- Sensor types:
 - Fixed Temperature
 - Smoke Detector
 - Product of Combustion

Water

- Dual water mains service both sides of the street = 6" residential or 8" high density
- When density is less than 1,000 people/square mile there's typically no public water supply
- Valves are located so that no single break in a line impacts more than 500'-0" of water
- Main water supplies are installed in a branch or gridiron system
- Main Wastewater lines are located at the center of the street
- Do not put wastewater/water lines adjacent for fear of contamination if a break/leak
- Wastewater lines on site need to be designed first to accommodate pitch and gravity
 - To convey solid material, must have up to a 2% slope, with velocity of 2 - 10 ft/second

Concepts/Goals:

- **Zoning Codes** vary between every city, and influence building design through the regulation of land, function, size, and exterior elements.
- If zoning ordinances and building codes give different maximum heights or areas, the lower of the two takes precedence.
- **Fire Resistance** is intended to permit safe egress, maintain structural integrity, limit the spread of fire help extinguish blaze, limit damage, and avoid collapse

Processes:

- **Determine Occupancy**
 - Establish one or more occupancy categories for a building and understand how the code treats different configurations and the relationship between different occupancies
 - **Incidental Use Areas:** areas treated as incidental must be separated by a one-hour fire barrier that have self-closing doors with no air transfer openings and/or have a fire suppression system
 - **Accessory Use Areas:** to be considered an accessory, an area can't exceed 10% of the total floor area allowed by the height/area table
 - **Mixed Occupancy:** if occupancies in a building are too large to be considered incidental/accessory then the building is considered to have mixed occupancy.
- **Identify Thresholds and Fire Areas**
 - Code emphasizes the importance of installation of an automatic fire suppression system. The threshold limit for fire suppression is based on one or more of the following:
 - The fire area or building are in which the occupancy is located
 - Where the occupancy is located in the building
 - The number of occupants in a building or fire area
 - Fire areas are enclosures that provide a certain number of hours protection based on the risk associated with the occupancy. e.g.: High Hazard (H) = 4 hrs, Utility (U) = 1 hr
 - Each fire area must be surrounded by firewalls, fire barriers (floors and walls) or exterior walls and roof.

- To avoid installing fire suppression within a space, a fire area separation can be used to subdivide a single occupancy.
 - As long as the fire areas with a building fall below the limits, no fire suppression is needed
- Sprinklers are required for any windowless stories, building taller than 55'-0", and underground structures with the lowest level below 35'-0" from the lowest level of exit discharge
- **Identify the Type of Construction**
 - Determining the limits on building height and area is tied to several factors, including the occupancy and if the building is fully sprinklered.
 - Classified according to degree of Fire resistance and determined by fire zone it is located and intended use
 - Buildings are allowed to have a one story and 20'-0" height increase if the building is protected throughout by a sprinkler system (does not apply to H occupancies)
- **Determine the Means of Egress**
 - Includes the path from any occupied space in a building to the public way, broken down into three elements:
 - **Exit access:** distance a building occupant must travel from the most remote point in the occupied portion of the exit access to the entrance of the nearest exit
 - Travel distance within a space is typically limited to 75'-0" before two distinct paths are required.
 - When a building requires two exits, the travel distance is only measure to one of the exits, not both
 - The overall travel distance from any space within a suite of offices to an exit is 250'-0", which includes the 75' of travel distance to an exit
 - **Exit:** a door that opens directly to the outside or a protected stair/ramp
 - Enclosed stairs are required to provide a fire-rated enclosure for 1 hour (2 hours if stair connect 4+ stories)
 - No limit on distance traveled within an enclosed exit
 - 50% of exits can discharge through a lobby space on the level of exit discharge if protects and has a sprinkler system
 - **Exit discharge:** the path between the exit door and the public way.
 - No dimensional limits on the travel distance once outside the building (except if exits discharge onto a balcony).
- **Determine System Requirements**
 - Other elements of the code will influence the design, including ventilation, plumbing, structural, materials, etc.
 - **Ventilation:** HVAC limits are based on minimum requirements for recirculated and fresh air required in a building from operable windows and openings. Mechanical ventilation is not required in any building, except when natural ventilation is not met.
 - Environmental issues like mold aren't addressed in building/mechanical code
 - Mechanical/Natural ventilation is required in crawl and attic spaces to prevent stagnant air
 - **Structural Design:** prescribes the minimum loads under various construction/load conditions.

- The building and its components are considered “dead loads”. Occupants are considered “live loads”.
- Environmental loads account for wind, snow, rain, earthquake, and floods that may impact a building
- **Special local conditions:** local code and regulations that are so specialized they can't be included in a general code.
- **Material limits:** specifications for minimum quality standards and means for determine the strength of a member to resist a given load.
 - Typical materials include concrete, wood, glass, steel, masonry, aluminum, and gypsum
 - New materials are permitted if their preference level can be proven and accepted by the review board.
- **Plumbing Fixtures:** Sanitation is fundamental to health, safety, and welfare of occupants. Types and numbers of fixtures to maintain sanitary conditions within a building type are mandated.

Adaptive Reuse of Buildings and/or Materials (also see general discussion under Programming + Analysis Content Area)

Vocabulary: None

Facts/Rules:

- National Park Service Standards for Preservation:
 - Use a property as it was historically intended to, or maximize the rendition of distinctive materials, features, spaces, and spatial relationships if there is a change
 - History character of a property will be retained and preserved. Do not replace historical materials that are intact or can be repaired
 - A property will be recognized as a physical record of its time, place, and use.
 - Changes to property that are now also considered historical will be preserved (e.g. the minoan columns at Knossos that were painted red as an act of restoration)
 - Distinctive materials/features/finishes/construction or examples of craftsmanship will be persevered
 - Existing condition of historic features will be evaluated to determine the appropriate level of intervention.
 - Chemical/physical treatments will be gentle if absolutely required.
 - Archeological resources will be protected/preserved in place
- Tax incentives and federal/state/local grants stimulate market for preservation
- Buildings must be 50 years old to qualify for listing on National Register of Historic Places

Concepts/Goals:

- Protection, maintenance, and repair are emphasized while replacement is minimized.
- Preservation/Restoration occurs to buildings that are specifically significant (designed by a famous architect, housed an important historic event, etc). These buildings are typically on the National Register of Historic Places
- Rehabilitation occurs to buildings in a significant historic district, but aren't individually significant (and are more likely to be able to take on a new use).

Processes:

- Prior to undertaking any work, a documented plan for preservation should be developed.
- **Identify, retain, and preserve historic materials and features:**
 - Identify the features that are important in defining the building's historic character and which must stay in order to retain that character.
 - Includes building siting, materials used (wood, brick, metal), features (roofs, porches, windows), interior materials (plaster, paint), interior features (wainscoting, moldings, stairways, spatial configuration, structural and mechanical systems)
- **Stabilize deteriorated historic materials/features as a primary measure:**
 - Include structural reinforcement, weatherization, or correct unsafe conditions
 - Should be carried out that it detracts as little as possible from the building appearance
 - Not necessary in every project
- **Protect and maintain historic materials and features:**
 - Protection generally involves the least degree of intervention
 - Includes maintenance of historic materials (rust removal, caulking, limited paint removal), cleaning (gutters, yard/landscaping), installing protective elements (fences, alarms)
- **Repair historic materials and features:**
 - Stabilize, consolidate and conserve
 - Includes repointing with correct strength mortar, patching/splicing/reinforcing wood/metal
 - All work should be physically and visually compatible
 - All work should be identifiable upon close inspection and documented for future research
- **Limited replacement of extensively deteriorate portions of historic features:**
 - Only use if all prior steps proves inadequate
 - Use surviving prototypes to replace missing/deteriorated in kind
 - Includes using wood where there was wood, metal where there was metal, etc.
 - Excludes hidden structural reinforcement and mechanical systems
 - All work should be identifiable upon inspection and documented for future research
- **Address energy efficiency, accessibility, health and life safety issues:**
 - Take care not to obscure, damage, or destroy character defining materials or features when upgrading a building to meet code and energy requirements.
 - Asbestos/Lead abatement should be carefully done so that important historic finishes are not adversely affected.

Specialty Codes + Regulations including accessibility laws, codes, and guidelines

Vocabulary:

- **Americans with Disabilities Act (ADA):** law that prohibits discrimination based on disability
- **Building Owners and Managers Association (BOMA):** professional organization that for commercial real estate professionals
- **Fair Housing Act:** law that prohibits housing discrimination on the basis of race, color, religion, sex, disability, familial status, and national origin.
- **HUD:** US Department of Housing and Urban Development

Rules/Facts:

• **ADA Accessibility Guidelines:**

- All new design or new construction areas must meet accessibility requirements
- Includes all employee work area and temporary construction that is open to the public
- Some areas are not require to be accessible:
 - Temporary construction facilities (e.g. Job shacks, scaffolding, trailers)
 - Raised areas used for security/life safety (e.g. Security or life guard towers)
 - Non-occupiable service areas accessed infrequently for maintenance (e.g. Mechanical rooms, penthouses)
 - Tollbooths
 - Water slides
 - Non-public animal containment areas
 - Raised boxes and wrestling rings
 - Raised structures for officiating/announcing sports events

• **Dimensional Standards:**

Wheelchair Passage Width	=	32" clr at a point/36" clr continuous
2 Wheelchair Passing Width	=	60" clr min
Headroom	=	80" min
Turning Space	=	5'-0" circle min
Clear floor space	=	2'-6" wide x 4'-0" long min
Changes in levels	=	1/4" max w/o edge treatment
Beveled Edge Ok	=	1/4" – 1/2" w/ 1:2 max slope
Requires Ramp	=	1/2" or more
Doors	=	32" clr min when open 90 deg
Shallow Closet Doors	=	20" clr
Door clearance	=	1'-6" clr on pull side of door
Accessible route cross slope	=	1:50 max
Ramps	Slope =	1:20 min to 1:12 max
	Width =	3'-0" wide
	Length =	30'-0" max
	Landings =	5'-0" at each end (width of ramp)
	2 Handrails =	If rise is +6" or run is +72"
Handrail Height	=	34" min - 38" max
Handrail Cross Section	=	1-1/4" - 2" and 1-1/2" clr from wall
Handrail Extension	=	12" past top and 12"+ 1 tread bottom
Stairways	=	48" clr between hand rails min
Walkways	=	1:20 max (5%)
Curb Cuts	=	3'-0" flared sides:1:10 max/front 1:12
Car Parking Space	=	9'-0" wide min with 5'-0" wide aisle
Van Parking Space	=	11'-0" wide min w/5'-0" wide aisle
Parking Space Location	=	200'-0" max from building entrance
7 - 50 car lot	=	2 accessible spaces
51 - 100 car lot	=	3 accessible spaces
101 - 150 car lot	=	5 accessible spaces

- An Area of Rescue will be located on one of the following:
 - A portion of a stairway landing within a smoke proof enclosure
 - A portion of an exterior exit balcony located immediate adjacent to an exit stair

- A portion of a 1-Hr fire resistive corridor located immediately adjacent to an exit enclosure
 - A vestibule located immediately adjunct to an exit enclosure constructed to the same fire resistive standards as required for corridors/openings
 - A portion of a stairway landing within an exit enclosure that's vented to the exterior and separated by 1-1/2 Hr doors, minimum
 - When approved, an area or room which is separated from others by a smoke barrier
 - An elevator lobby when the elevator shafts and adjacent lobbies and pressurized as required for smoke proof enclosures
- **BOMA Standards to calculate rentable area:**
 - Rentable area includes a share of common restrooms and corridors
 - No deductions are made for columns or projection necessary to the building
 - When measuring from an exterior wall which is more than 50% glass, measure from the inside face of glass
 - Measure to the centerline of demising walls
 - Measure to the inside face of walls
- **Fair Housing Act Guidelines:**
 - Covers most housing (owner-occupied building with 4 or less units, single family houses sold/rented by owner, and housing run by clubs that limit occupancy to members are sometime exempt)
 - Landlords/Real Estate Agents/Lenders can't take any of the following actions based on race, color, national origin, religion, sex, familial status, or handicap:
 - Refusal to rent or sell
 - Refuse to provide information regarding loans
 - Refuse to negotiate for housing
 - Making Housing unavailable
 - Deny a dwelling
 - Set different terms, conditions, or privileges for sale or rental (e.g.: rates, points, fees, monthly rent)
 - Falsely deny that housing is available for inspection, sale, or rental
 - For profit, persuade owners to sell or rent
 - Threaten, coerce, intimidate, or interfere with any exercising a fair housing right or assisting someone who is
 - Advertise or make a statement that indicates a limitation or preference based on race, color, national origin, religion, sex, familial status, or handicap
 - A resident with a documented disability cannot be refused the opportunity to make reasonable modification to their dwelling/common use area (at resident's expense) for the person to be able to use it.
 - A resident with a document disability cannot be refused reasonable accommodation in rules/policies/precuts or services, if necessary for the resident to use the building (e.g. A complex with a "no pet" policy must allow a visually impaired tenant to keep a guide dog)
 - Housing doesn't have to be made to a person who is a direct threat to the health and/or safety of others (through the use of violence, illegal drugs, etc)

- Requirements for New Buildings with 4 or more units and an elevator:
 - Public common area must be accessible
 - Doors and hallways must be wide enough for a wheelchair (32"-36" min)
 - All units must have:
 - An accessible rough into and through the unit
 - Accessible light switches, electrical outlets, thermostats, etc
 - Reinforced bathroom walls to allow later installation of grab bars
 - Kitchens/bathrooms can be used by people in a wheelchair
 - These rules do not replace more stringent state/local codes
- Unless a building/community qualifies as housing for older people, it can't discriminate against pregnant women, anyone securing legal custody of a child, or families with one or more children under 18 who live with a parent/legal guardian/designee with written consent.
- **Life-Safety Code (NFPA 101) Guidelines**
 - Not a legal code, but written like one to facilitate adoption into law by cities
 - Addresses construction, protection, and occupancy features necessary to minimize danger to life from fire including smoke, fumes, or panic.
 - Does not address general fire prevention or building construction features that are normally part of fire/building codes.
 - Applies to existing and new structures
 - Is a source for determination of liability in accidents
 - Groups flame spread ratings (materials propensity to burn rapidly and spread flames) into 5 classes

Class A flame spread rating	=	0-25
Class B flame spread rating	=	26-75
Class C flame spread rating	=	76-200
Class D flame spread rating	=	201-500
Class E flame spread rating	=	over 500
 - A flame spread rating number is the relative rate at which flame will spread over the surface of a material, as compared with flame spread on asbestos-cement board (rated zero) and on red oak (rated 100).
 - Flame spread rating number is not the rate at which the flame actually spreads along the surface and is not an indication of the fire resistance of the material.

Concepts/Goals:

- Accessibility services scope can vary depending on the size of the client, their organization, and the project.
- Name recognition matters...large, public, visible companies are more vulnerable to lawsuits so need to be prepared for issues.

Processes:

- Identify client's potential accessibility problem areas and desired outcomes
- Identify strategies for correcting problems including a proposed implementation schedule and budget/cost analysis
- Develop prototype design details for implementation
- Prepare and administer surveys if required to assess population using building
- Prepare client training program manuals and facility monitoring documentation

CONTENT AREA: PROJECT + PRACTICE MANAGEMENT

Project Delivery Methods

Vocabulary:

- **Unbundling:** when an owner structures their own project teams, lead by a third party project manager.

Facts/Rules:

- **Key Players:** owner - architect - contractor
- **Key Construction Delivery Methods:** Design-Bid-Build, Design-Build, Construction Management
- **Key Professional Delivery Methods:** Owner/Architect (with consultants, Multiple Prime, Joint Venture)

Concepts/Goals:

- The architect/consultant relationship may be established just for the project, or it could be a long standing working relationship
- Architect's coordination responsibilities should be limited to coordinating services with those of the consultants or other design professionals retained by the owner.
- All design professionals should be contractually obligated to coordinate their services with those of the architect, no matter who they contract with.
- The architect should never assume responsibility for internal coordination of any other design professionals work.
- **Architect-Consultant Agreement:** architect assumes primary contractual responsibility to the owner for the accuracy and completeness of the work of the architect's consultants.
 - If something goes wrong, the architect can be held liable.
 - Agreement should parallel owner-architect agreement
- **Multiple Prime:** a design professional holds an agreement directly with the owner or their project manager. The owner may:
 - Provide overall coordination of the multiple prime design professionals, including the architect, through in-house staff
 - Assign coordination to a project/program manager
 - Allocate coordination to one of the design professionals...maybe the architect
- **Joint Venture:** a contractual union between two or more firms for one or more specific projects.
 - Enables firms to combine key resources while allowing each participating firm to pursue other projects.
 - Essentially like a partnership
 - Retains no and pays no income taxes...it passes profits and losses and tax liabilities to its participating members.
 - Participating firms are individually and jointly liable to the client and others for the services offered by the joint venture.
 - Typically formed only for the purpose of seeking a specific project.
 - E.g.: a international firm joins with a local firm to complete a project

Processes: None

Project Budget Management

Vocabulary:

- **Preliminary Costs:** SF Cost Estimates; based on occupancy, size & type of construction
- **Detailed Costs:** Itemized break down
- **Utilization Ratio:** Used by firms to determine the amount of time spent on billable work as a percentage of total time the employee is compensated. $UR = \text{billable hours} / \text{total hours}$
- **Value Engineering:** process to get the best value for the project using similar, but more affordable materials and techniques
- **Pro-forma:** financial analysis of a building project which involves cost/return on investment
- **Cost of money or debt service:** principal and interest payments
- **Depreciation:** federal tax benefit with the idea that a building loses value as it ages
- **General Obligation Bond:** used to finance non revenue collecting facilities
- **Revenue Bond:** Used to finance revenue collecting projects (tolls, etc)

Facts/Rules:

- There are multiple methods of calculating fees for architectural services:
 - **Multiple of Direct Salary Expense (DSE):** everyone's direct salary/wages multiplied by a factor to cover fringe benefits (e.g. Employee health insurance), overhead, and profit
 - **Multiple of Direct Personnel Expense (DPE):** fringe benefits are included in direct salary/wages...that expense is multiplied by a factor to cover overhead and profit
 - **Professional Fee plus Expenses:** professional services are separated from the services from identified costs (reimbursables, consultants, etc)
 - **Hourly Billing Rate:** project is billed at standard rates for every hour worked. Often this is to a "not to exceed" value without consent of the owner.
 - **Stipulated/Lump Sum:** a specific amount is agreed upon for the total payment
 - **Percentage of the cost of work:** based on a percentage of construction cost
 - **Unit price contract:** based on acceptance and incorporation of unit price quotes for the various portions of the project
- Add a fixed percentage contingency (5-10%) in complex or remodel jobs to address any unforeseen problems or issues that come up during the design and/or construction
- Traditional design fees:

Architecture	=	10% of construction cost
Mechanical	=	15%
Electrical	=	12.5%
Civil	=	10.5%
Structural	=	9.4%
- Traditional contractor fees:

General Overhead	=	8-10% value of firm value
Project Overhead	=	4-10% of construction cost
Profit	=	15-20% small jobs 10-15% large jobs 5 - 10% very large jobs
- Traditional construction fees:

Construction Cost	=	Amount of \$\$ to build
Construction Budget	=	85% construction cost
Contractor's OH/Profit	=	15 - 40% construction cost
Surveys, testing, fees, FF&E	=	15%

- Traditional project budget:

Site Acquisition	=	not included in project budget
Utility/Off Site Construction	=	not included in project budget
On Site construction	=	10-20% of construction cost
Building construction	=	10-15% of construction cost
Contingencies	=	5-10% of construction cost
Professional Services	=	varies
Inspection and Testing	=	varies
Financing	=	varies

- It is normal practice to anticipate construction cost escalation on the basis of an annual increase projected to the midpoint of construction.

Concepts/Goals:

- Cost Projection Objectives:
 - Complete the project within the financial limits set by the owner
 - Provide an appropriate use of resources/value for the money within the budget
 - Optimize longer-term life cycle costs by examine alternative that offer the best balance between upfront costs and maintenance costs
 - Provide the owner with relative implications to the budget based on owner decisions throughout the project duration.
- Cost Projections for a project are based on four factors:
 - **Cost Factors:** what influences the project
 - **Project Scope:** what's included in the building
 - **Quality:** how nice the building will be (construction, technologies, finishes)
 - **Budget:** how much the owner can spend
- Typically architect estimates cannot account for inflation, market conditions, and contractor means and methods.
- Other factors that influence the construction budget include:
 - Availability of labor and materials (if there's no work, people will do jobs for cheap, if there is work, prices go up...basic supply and demand principle)
 - Labor rates fluctuate depending on cost of living, demand, project location, deadline
 - Material prices fluctuate depending on the market, where they ship from, etc
 - Convenience of transportation
 - The more remote the location the more expensive
 - Costs are less predictable in rural areas

Processes:

- The appropriate type of cost estimating for a building depends on the phase of the project it is developed to:
 - **Pre-Planning/Proposal:** based on unit costs (the cost per person, cost per bed, cost per sf, etc)
 - **Programming:** based on unit cost system (cost per sf) based on similar building types and/or functions of spaces
 - **Schematic Design:** based on the major elements of each building system (mechanical, electrical, plumbing, structure)
 - **Design Development:** based on detailed components (curtain walls, storefronts, lay-in ceilings, etc)

- **Construction Documents:** based on unit rates for construction competes, assemblies and systems. This estimate is what pre-bid cost checks and cost breakdowns are based on.

Project Schedule Management

Vocabulary: None

Facts/Rules:

- Typical phase breakdown for architectural services (programming is an extra service):

Schematic Design	=	15%
Design Development	=	15%
Construction Documents	=	35%
Bid/Negotiation	=	5%
Construction Administration	=	30%

 Sometime Project Closeout is broken out to about 2-5%
- Project calendar days = number of working days x 5 or 7
- Schedules are impacted and influenced by:
 - The size of the project
 - The complexity of the budget
 - The number of people working on the project
 - Client action/reaction time (and to an extent, municipal review time)
- Risks of extending the schedule:
 - Can increase costs due to inflation
 - Team members could change, causing a learning curve
- Risks of shortening the schedule:
 - Requires people to work overtime (costly/inefficient)
 - Requires the need to hire more people (learning curve to project and office standards)
 - If no employee changes are made, drawings can turn out poor, uncoordinated, etc
 - Generally causes higher costs for design and construction for a lower quality project

Concepts/Goals:

- Projects follow different types of construction schedules:
 - **Gantt/Bar Chart:** illustrates start to finish dates of a project broken out by activity.
 - They focus primarily on schedule management rather than the size of the project or the relative size of the work elements/activities.
 - Can't show the relationship between activities
 - **Critical Path Method:** all events expected to occur and operations to be performed in completed a given process are rendered in a form permitting determination of the optimum sequence and duration of each operation.
 - The diagram is called a **Network Diagram**
 - Circles are start and finishes, arrows are tasks, numbers show the time for each task to occur.
 - **Critical Path:** the path with the longest required time from start to finish is the basis for the schedule. Activities on this path are called **critical activities**.
 - **Float:** range of time during which non critical activities can start/end without affecting the overall schedule
 - **Total Float:** individual float times added together don't influence the critical path time
- **Fast Track Schedule:** Construction documents are issued in phases and construction begins while design is still being finishes.

- Requires coordination between architects, contractors, and construction managers
- Requires staged bidding, which might result in multiple contractors.
- Can reduce time of project by 10-30%

Processes:

- Scheduling the five phases of the design process varies depending on the project size and complexity, the quality of the client's program, the design team, and the decision making ability of the client. Generally the following applies:

Schematic Design	=	1 - 2 months
Design Development	=	2 - 6 months
Construction Documents	=	3 - 7 months
Bid/Negotiation	=	3 - 6 weeks (contractors: 2 weeks to bid)
Construction Administration	=	Varies
Contingencies	=	25-50% of length of project

Contracts for Professional Service + Contract Negotiation

Vocabulary:

Facts/Rules:

- Types of AIA Contracts:

A Series	=	Owner + General Contractor Agreements
B Series	=	Owner + Architect Agreements
C Series	=	Architect + Consultant Agreements (joint ventures)
D Series	=	Industry Standard Documents
G Series	=	Contract & Office Administration Forms

- **Division One:** The General Requirements Division of the specifications which establishes the administrative/procedural duties of the contractor, architect, owner during construction.
- **General Contract:** The agreements between the owner and the contractor for the construction of a project.
- **General Conditions:** The part of the contract documents which states the rights, responsibilities, and relationships of the parties involved (owner/arch/consultant/contractor/sub/vendor)
- **Supplementary General Conditions:** Additional conditions, included in the project manual, that are used to modify the General Conditions of the Contract for Construction in order to allow for any specific legal, climatic, or site conditions of the particular project.
- **Special Conditions:** Additional requirements to the Supplementary General Conditions of the Contract for Construction. These requirements are usually requested by government or local building agencies. Special conditions are used when supplementary conditions must be further extended.
- **General Requirements:** defines the specific procedures that a contractor must follow.
- **Single Prime Contract:** A contract for building construction under which one prime contractor is responsible for the entire project, in contrast to having separate contracts.
- **Separate Prime Contract:** One of several owner-contractor agreements for a project, each of which provides for constructing a major portion of the work (general construction, electrical, mechanical, etc.)

Concepts/Goals:**A101: Standard Form of Agreement Between Owner & Contractor:**

- Document Partners with AIA A201: General Conditions
- Contract Document the contractor agrees to are: Agreement, Conditions of the contract (general and supplementary), drawings, specs, addenda, and any other additional documents
- Contract supersedes prior negotiations, representations or agreements, written or oral
- The date of the commencement of work is date of agreement unless other date is listed
- Contract time is measured from the date of commencement
- Set the date for substantial completion
- Call out provisions for liquidated damages or early completion bonuses
- Liquidated damages are not a penalty to be inflicted on the Contractor, but must bear an actual and reasonably estimable relationship to the owner's loss if construction is not completed on time.
- If liquidated damages are to be assessed because delayed construction will result in actual loss to the Owner, the amount of damage due for each day lost should be entered in the Supplementary Conditions or the Agreement.
- Contract sum is called out in a lump sum amount based on alternates and/or unit prices
- Pay Applications are for 1 month ending on the last day of the month unless specified differently, and are based on the schedule of values supplied by the contractor.
- Typical progress payment = percentage of contract sum complete or stored on site + state sales tax (if applicable) – retainage – prior payments
- The last day upon which work may be included in an Application should normally be no less than 14 days prior to the payment due date, in consideration of the 7 days required for the architect's evaluation of the Application and issuance of a Certificate for Payment and the time subsequently accorded the Owner to make payment.
- Unless owner approve, contractor shall not make advanced payments to suppliers for materials/equipment which has not been delivered & stored on site
- Final payment issued when contractor has fully performed contract requirements (some minor punch list issues can remain) and final certificate of payment is issued by the architect
- Owner to pay w/in 30 days of the final certificate of payment
- Contract can be terminated/suspended by either party per the A201 General Conditions

**A201: General Conditions of the Contract for Construction
(notes from Schiff-Hardin Lectures)**

- Part of the construction contract
- Not a contract, there's no signatures, and it's not project specific. It's generic.
- Most important document in the industry
- Owner is responsible for determining the time limits for construction
- "Pro" contractor documents aren't included in the contract documents.
- No direct contract between architect/contractor, owner/subcontractor.
- Doesn't bind/contract architect for anything.
- Architect is intended to be a third party beneficiary in this agreement.
- Architect/consultants are owners of their respective instruments of services.
- Owner will designate in writing who will be the owner's agent with actual authority
- Architect is not the owner's agent for dealing with the contractor. Not directly responsible to owner except for what the architect has to do to complete their contract obligations
- Contractor's biggest worry is money and they have the right to ask the owner to furnish evidence that they can pay for the project.

- If contractor fails to do work, or correct work that isn't agreement with the documents, the owner can stop the work until the problem is fixed.
- If contractor does something wrong, and doesn't fix it within 10 days of notice, then the owner can pay someone else to do it, and reduce the contract sum by a CO to pay for the corrections.
- Signing the contract by the contractor that the contractor has visited the site, is generally familiar with site, and with the requirements of the documents
- If contractor finds a problem or error, they have to let the architect know (no sandbagging). They can't play dumb.
- Contractor not required to check drawings against code, but if they see something that doesn't comply they have to say something.
- Contractor is not liable for errors and omissions made by the architect.
- Contractor is solely responsible for means, methods, techniques, sequences, and safety procedures.
- Contract is responsible to the owner for acts and omissions of the contractor's employees, subs and other people performing work
- Substitutions can only be made with the approval of the owner.
- Warranty is like a guarantee which is being made to the owner and the architect.
- General warranties of quality have no time limit
- Contractor secures and pays for building permit
- If the contractor knows something is illegal and builds it anyway, they're responsible to fix it
- Type one concealed/unknown site conditions: drawings are wrong based on what architect or consultant were given.
- Type two differing site conditions: documents are silenced, typically something is missing
- If a concealed or unknown condition is found, then contractor gets an equitable (time and or money) adjustment.
- Indian Village Clause: if remains, archaeological sites or wetlands are found, work must stop until a federal solution is determined.
- Allowance: a placeholder for something not fully designed or specified (e.g.; \$5,000 for cabinets that haven't been spec'd at the time of bid)
- Contractors often cheat with allowances to look like the lower bidder. Have to take these out of bids so actual hard prices are being compared to determine lowest bidder.
- Contractor will supply a schedule of the work for the architect's information. Don't approve.
- Contractor rarely submits a submittal schedule.
- Submittals that are not required by the contract documents may be returned by the architect without action.
- Contractor isn't relieved from responsibility for deviating from the shop drawings if the architect misses a mistake that isn't called out by the contractor.
- Indemnification is used in the guise of contribution/allocation of fault.
- Architect will be an owner's representative when given explicit authority.
- Owner and contractor will try to communicate through the architect
- Architect has the authority to reject work and require to special testing/inspection
- Archie will interpret and decide matters concerning performance under and requirements of the contract documents. Decisions will be in writing and will be fair and impartial.
- Subcontractors operate under the same rules and procedures as the general contractor
- General contract remains liable to the owner for subs mistakes
- Subs aren't responsible for other subs (unless they're sub-subcontractors)
- If a contractor is not paid, they can place a lien on the property. They have 90 days to send a letter to the contractor, owner, and architect, and then 30 days to file the lien.
- If the general contractor is paid and the subs file a lien, the contractor is responsible to deal with it.
- Changes are modifications in the work
- Change Order (CO) is usually in writing, signed by the owner, contractor, and architect to say that the change complies with the design

- If owner wants a change but can't agree with the contractor, owner can give a construction change directive. The change can progress, but the price/time can be settled upon later.
- Architect has the authority to issue minor change in the work, that don't affect price/time
- Change orders can be additive or deductive (additive includes markup, deducts don't)
- Contractor is entitled to have a change order when the owner makes a change, there's an architectural mistake, or other times when the owner is responsible event.
- Excusable events (tornado, storm, force major events) that delay the project, but owner's aren't responsible. There's an extension of time. Cost is covered by an insurance policy.
- Inexcusable events are when the contractor is at fault and the contractor is not entitled to extra time or money.
- A cardinal change is something an owner doesn't have the right to make the contractor do. If they do, the contractor can terminate the contract without breach of contract
- Issues of delay are the biggest source of claims and fighting that goes on.
- Once the owner moves in at substantial completion, then the construction time has stopped
- There is always a trade off between time and money.
- Critical path through a project is the sequence of work that must be done in that order to complete the project. If you add a day to a critical path activity, then you add a day to the project.
- Contractor prepare schedule of values and includes and updated copy with each pay app
- Contractor warrants title to the work, or freedom from liens, for all work covered on pay app
- Contractor will pay subcontractors within 7 days of receiving payment
- Owner/Architect have no responsibility to ensure that subcontractor gets paid when general does
- Progress payments occur until about 95% complete, then it's substantial completion
- Contractor prepares punch list, architect makes an inspection and adds to it as needed
- Certificate of final completion means everything is done
- By accepting final payment, contractor waives all rights except those previously made in writing
- Retainage is typically 10% of the contract price
- Contractor is totally responsible for safety issues
- If contractors find hazardous materials, they'll stop work, notify owner/architect, get lab testing, and the owner will hold contractor harmless.
- Owner has the right to require a bond posted.
- One year warranty to come back and fix anything that's broken from the date of substantial completion
- No claim can be made after 10 years by either party
- Contractor can terminate with 7 days notice. Typical reason is for failure to receive payment, or the govt shuts down the project
- Owner can suspend/terminate for convince, but has to pay contractor for all work done and paid for lost profits.
- 21 days written notice for claims and disputes after occurrence
- Architect is typically the decision maker (but can be someone else) when dealing with dispute, unless owner/contractor decide to go on to mediation (then arbitration/litigation)

B101: Standard Form of Agreement between Owner + Architect (notes from Schiff-Hardin Lectures)

- Architecture agreements...by and for architects
- If services increase then so should your fees
- Architects do not make guarantees or warranties. They are professionals.
- Scope of Architect's Basic Services = most important article in contract
- Architect is responsible for basic services. (Architecture, MEP. Civil typically isn't)

- Architect is entitled to rely on accuracy and completeness of services and information furnished by the owner/owner's consultants.
- **No Sandbagging Allowed:** no sitting on incorrect information that you discover. Promptly notify owner of an error or issue in writing.
- Architect not responsible for an owner's decision made without architect's approval. Usually initiated by the contractor for cheaper substations that might not be in the best interest of the project.
- Can't be responsible for filing with the city/govt because if something is held up by them, then you could take the blame.
- During schematic design you must at least talk about environmentally design options
- Architect typically only gets in liability trouble in two phases: CD's and CA.
- Architect has no control/responsibility over means, methods, techniques, procedures, and safety. Or for the contractor to be responsible for the contractor's failure to perform the work in accordance with the contract documents.
- A **site visit** is not a **site inspection**. Visits are eye-balling, looking at things in a general fashion...making sure that when fully complete the project is in compliance with the contract documents.
- Will report to owner any known deviations/defects that you are aware of (no sandbagging)
- Architect has authority to reject work that is not in compliance with the contract documents
- Will review submittals for checking the conformance with information given and their design concept expressed in the contract documents.
- In design build, engineers hired by the construction team must prepare, stamp, and seal documents. You can trust that their engineer is just as capable as yours.
- Cost of work = total cost of project, but does not include compensation to architect or architects consultants, cost of land, financing costs, etc.
- RFIs are turned around quickly.
- Architect will conduct **inspection** (a painstaking, detailed analysis) to determine date of substantial completion.
- Final Certificate of Payment = Project Over
- Contractor prepares initial draft of punchlist, and architect's adds what's missing.
- Prior to the one year expiration of the date from substation completion, architect walks the site with owner to review how the facility is working, without compensation. It's really a PR move to get your face in front of the owner again.
- Additional/Optional Services include programming, measured drawings, existing facility surveys, civil engineering, landscape design, BIM, LEED certification, FF&E...etc.
- Additional services necessary that are your fault must be done without additional compensation.
- There are limits on basic services, architect should't be penalized for faults of others (e.g.; 2 reviews of shop drawings are ok...any more and you're spending too much time dealing with the contractor's errors)
- Assumes that the owner is somewhat sophisticated. They'll provide information architect needs for design, including:
 - a written program.
 - Establish and update a project budget.
 - Identify a representative authorized to act on the owner's behalf.
 - Furnish surveys/geotechnical services
 - Owner will coordinate their consultants with you
 - Won't sandbag you if they find out something is wrong
 - Will fill architect in on anything communicated with the contractor

- Coordinate the architect's duties stated in the construction contract with what's in the architect/owner contracts.
- Architect estimates are different than contractor estimates. It's very rough.
- Surprised owners are the number one source of claims
- If architect's budget exceeds owner's budget, the architect will make recommendations to adjust the size/quality/budget and the owner will cooperate.
- If bids come in too high from budget, then architect/owner has different options. Including, architect must, for free, value engineer documents down to make the budget. Architect doesn't have to pay the difference of price of bid and budget.
- Intellectual Property: ideas are real and personal
- Architects and their consultants are owners of their instruments of service. Owner's are licensed to use the documents.
- Owner can only use documents for their project, if the owner doesn't pay, then they can't use the drawings under federal copyright law.
- If owner uses drawings without you, (e.g. Terminates architect but gives the documents to the contractor to build from) then they indemnify/hold architect harmless from any liability issues, and must pay any legal fees that arise from the use of the documents.
- Architect/owner waive consequential damages or remote damages that arise.
- Mediation required prior to arbitration or litigation
 - Mediation fees shared equally
 - Held in place where project is located unless agreed upon
 - Resolutions are enforceable as settlement agreements
- Arbitration – used when mediation does not resolve issue
 - Demand for arbitration cannot occur after legal proceedings have been started
 - Arbitration relates to owner and architect only under terms of agreement
 - Award rendered by arbitrator is final
- Agreement governed by law in the principal place of business of the architect unless otherwise indicated
- No responsibility for hazardous materials
- Owner will give professional credit to architect on owner's promotional materials for project
- Termination/Suspension:
 - Owner failure to pay is cause for suspension
 - Owner can suspend for their conveniences, without cause. Architect can't
 - Architect to provide 7 days written notice
 - Before resuming services architect shall be paid all sums due & expenses for interruption & resumption of work
 - If project suspended more than 30 days by owner architect is due compensation for all services performed prior to suspension
 - **Termination expenses:** expenses due to the termination of the project for which architect is not otherwise compensated + amount for anticipated profit on the value of services not performed by the architect (almost always taken out by owners during their review)
- No third party that will invest rights in the project.
- Architect has right to use photos/representations of their work for marketing
- Compensation type (lump sum, hourly, %) is defined & breakout of project phase % given
- If owner fires architect midstream and tries to keep using the documents with a different architect (cheaper, etc) then the owner will pay a licensing fee.
- Owner won't withhold amounts from architect's compensation unless architect is liable
- This is a total agreement and supersedes any previous agreement.

C141: Standard Form of Agreement Between Architect & Consultant

- Consultants are responsible for code compliance for their areas of work
- Signing of documents makes consultant responsible for compliance with applicable codes and regulation
- Consultants are responsible for the accurate production of their own drawings and specifications; should check own documents for consistency

Processes: None

Construction Procurement Process

Vocabulary: None

Facts/Rules:

- **Design – Bid – Build Construction Delivery Method:**
 - Most common of delivery methods... public work traditionally uses this method
 - Consists of three parties: owner, architect, and contractor
 - Two separate contracts: owner + architect and owner + builder
 - Established process with legal and procedural guidelines
 - Typically involves competitively bid, lump sum construction contracts based on complete and prescriptive contract documents
 - Work is conducted in a linear sequence
 - Final contractor selection based on lowest responsible bid or total contract price
- **Design – Build Construction Delivery Method:**
 - Two parties: owner and designer-builder
 - Consolidated entity provides design and construction services to the owner
 - Offers the owner a single source of responsibility
 - Provides continuous execution of design and construction
 - Phases overlap – design and build (fast track)
 - There is only one contract: between owner + design-build organization
 - Design-build entity can be lead by either architect or general contractor (though typically it's led by the contractor)
- **Construction Management Construction Delivery Method**
 - Three parties: owner, designer, construction manager
 - Two contracts issued: owner + architect and owner + construction manager
 - Construction manager typically provides pre-construction services during the design phase then takes on the financial obligation for construction under a specified cost agreement
 - Frequently based on a guaranteed maximum price
 - Construction manager contracts with subcontractors
 - No contractual relationship between the designer and construction manager
 - Phases will often overlap, allowing for fast track project

Concepts/Goals: None

Processes:

- **Contractor Selection Approaches** are typically based on price, qualification or a combination of the two. Depending on the owner and what kind of funding they have (loan, grant, etc) contractors can be selected through various methods:
 - Request for Qualifications (RFQ): no bid or price given to complete work, just experience
 - Request for Proposal (RFP): presentation on how project would be done submitted
 - Interviews to review bidders
 - Negotiation to settle on contract price
 - Low-Bid: Based only on the lowest total cost (sometime with alternates)
 - Best Value Bid: based on weighing bid and qualifications

Risk Management + Legal Issues Pertaining to Practice + Contracts**Vocabulary:**

- **Mediation:** not legally binding. Use of a mediator to reach agreement between each party
- **Arbitration:** legal technique for the resolution of disputes outside the courts. It's a form of binding dispute resolution, equivalent to litigation in the courts.
- **Litigation:** conflicts/disputes that are resolved in a court of law. Typically a last option.
- **Subrogation:** legal technique where an insure takes over for a party for whom it has made a payment. (e.g. damage to a property under construction caused by a subcontractor is covered by insurance who then sues subcontractor in the owner's name)

Facts/Rules:

- Architects should carry multiple types of insurance for their protection.
 - More than the required minimum insurance may be needed for a job. Anything extra is noted in the supplemental conditions
- Types of Insurance include:
 - **Professional Liability:** Held by architects/design professionals. Liability due to negligence or not meeting the standard of care expected of them. (eg: not designing ADA compliant restrooms in a public building)
 - **Workers Comp:** Held by almost everyone. Liability to employees for injury or sickness as a result of their employment.
 - **Property/Builders Risk:** Held by owner. Covers any damages, loss of work on site/ off site/in transit.
 - **Loss of Use:** Held by owner. Covers any financial loss due to delay in construction because of damage, accidents, fire, other hazards needed to be dealt with.
 - **Product & Completed Operations:** held by contractor. Liability for damages caused by installed goods after the construction phase and transfer of title.
 - **Contractual/Indemnification:** Liability assumed by contract where contractors agree to hold owners/architects harmless for damages that are the result of specific events.
- The owner can require the contractor to submit a certificate of insurance with a bid to prove what insurance he carries and what his limits are.
- NO SUBROGATION. Owner/Contractor should keep this provision in the AIA 201 document, so the insurance company, after paying out, can put themselves in the shoes of their client and go after whoever might be responsible for the damage that's otherwise "No-Fault". You don't want the owner's insurance company going after the contractor if there's some sort of freak fire in the middle of the night that could somehow be tied back to him.

Concepts/Goals:

- **AIA Ethical Standards**

- Code applies to all AIA members regardless of membership category
- Common ethics violations:
 - Attribution of credit
 - Accurate representation of qualifications
 - Attainment and provision of examples of work
- Basic honesty Penalties for Violations:
 - Admonition (private) – letter of ruling sent to the parties and kept in the member's file
 - Censure (public) – letter is sent and notification of the case and ruling is published to AIA membership
 - Suspension of membership – membership is suspended for period of time; 1 or 2 years & ruling is published
 - Termination of membership – membership is terminated & ruling is published

Processes: None

CONTENT AREA: SITE ZONING VIGNETTE

Steps For Completion

Site Plan

- Write down all requirements from the program on paper. Note setbacks, easements, heights, and any special instructions
- Turn on Grid
- Turn on Full Cursor
- Sketch all site setback lines: front, rear, sides
- Sketch any non-linear high water/curved setback requirements with a series of circles with a radius of the required setback. Place the center of the circle on the line, and draw all setback lines tangent to the edges of the circles.
- Draw Surface Improvements (blue)
- Sketch all building setback lines: front, rear, sides, easements
- Draw Buildable area (yellow)
- Verify all lines with the requirements...just to be safe.

Section

- Locate the section cut line
- Sketch vertical lines down from where contours intersect the section line
- Locate benchmark
- Draw grade profile from labeled heights of contours. Note any swales or ridges.
- Sketch any limits, including max height, angles or offsets from edges of property
- Draw building profile. Do not draw a profile line along top of the grade.
- Verify all lines with the requirements...is the building profile cut in the right spot?

Tips

- Use the grid
- Use the full cursor
- Verify math and double check dimensions with measure tool
- Verify scales of grids...vertical and horizontal might be different
- Get dimensions as accurate as possible. If lines won't snap directly in the correct spot, err on the minimum and make the line slightly smaller than the maximum requirement
- If building profile line won't snap directly to the grade, take it one click past the line into the ground
- If the angled line won't work out exactly, make it within .05 degrees (e.g. If you can't get a 30° line, try for a 29.99°)

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