

New Course as of January 14, 2011 >
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RE66C11: Anatomy of Commercial Building: The Basics



1. Architectural & MEP (mechanical, electrical, plumbing) Systems (the basic overview) (0 mins)

- The material overview to the broker audience to include the basics of mechanical, engineering and physical systems that commercial real estate brokers need to understand
- The Skeleton of an office building
- The "skin" and its components
- The Circulatory System, piping, air ducting, air flow
- The Brain or power for the building
- The external site conditions

2. The "Skeleton": Foundations and Footings/The Frame/The Elevator & Stairs (25 mins)

a. Foundations and Footings

- How the foundation and footings work as a system
- The geotechnical conditions of soil and water table that can affect a tenant's load needs
- "Dead" and "Live" Load requirements critical to tenant's office selection and critical to a broker's knowledge in leasing of office buildings. This information is most critical in the initial leasing stages for a broker in assisting tenant requirements.
- Its impact on floor load capacity for the tenant use
- Discussion on the footings being the most critical to tenant needs, use and final building decisions especially for upper floor use
- Formwork and sheeting
- Piles and grade beams
- Up-down construction
- Key Issues of concern to brokers: Seismic compliance

b. The "Frame"

- The frame supports the building, its impact on tenant use, office subdivision, floor load and aesthetics of exterior material
- How the frame impacts column spacing, tenant office configuration, office layouts, demised office locations on perimeter walls and floor load capacity of office equipment
- The frame's impact on floor to floor heights and beam depths, impact on employee lighting, morale and fatigue issues, productivity, and leasing decisions
- Roof framing, the open web joist, decking, impact for satellite dishes and tenant telecom communications, and other concrete structures.

c. Elevators & Stairs

- Two means of egress required from every floor and/or building (i.e. stair or door)
- How this affects tenants leasing multiple floors
- Two doors out of an office suite unless it is less than 100' to the furthest point
- Elevator lobby doors must be tied into a fire alarm system so that nobody gets trapped in lobby
- Elevator types: Piston, cable and traction
- How tenants value the speed of each type of elevator system and its impact on the needs of upper floor tenants, tenants with multiple floor needs and tenants with private elevator service to its space or with security issues
- The capacity of an elevator to meet tenant needs: passenger v. freight

3. "The Skin": The Roof, Wall Cladding and Windows/Doors (25 mins)

- Key issues of concern to brokers: having a well-insulated, dry building

a. The Roof

- The roof construction types: adhered, fastened and loose-laid, ballasted
- Impact to tenant's wanting newer vs. older buildings and new roof replacements vs. repair issues
- Impact to tenant's functional use of space, water leak issues, property leasing issues, warranties and rental impact as well as operating expense impact
- Materials: built-up, EPDM (ethylene, propylene, diene monomer), Thermoplastic
- Flashing issues and impact to the tenant
- Focus on suburban office buildings
- "Green" roof in the cities and the tenant's younger workforce desires for environmentally sound buildings
- How cities are favoring "green" buildings
- The benefits to the tenant; attractive/useful, rain water collection; heat island insulation

b. Wall Cladding

- Performance issues: "U" value of wall system and energy efficiency
- Quantity and type of glass that affects sun glare to the tenant, energy efficiency and impact on mullions and office layout configuration

c. Windows and Doors

- Window types: ribbon, punched, storefront and structural glazing;
- Framing: mullion spacing, sunshading
- Glass types: single/double/triple; low E/colored
- Impact on office configuration, demised offices, lighting to core space, perimeter offices and impact of sun heat on the AC (air conditioning) and operating expenses to tenant

4. HVAC: What is it for? (25 mins)

- HVAC = Heating, Ventilation, Air Conditioning
- Impact on employee comfort, office equipment heat and the most critical complaint of office tenants in selecting space
- What's a ton? Tonnage impact on tenant's employee base and office density factors
- What's a "cfm"? (cubic feet per minute)
- Packaged rooftop unit system: suburban office buildings, centralized, low first cost, high utility costs to tenant but low maintenance. Tenant's ability to control after hours
- HVAC ductwork; VAV (variable air volume) & fan box; operating efficiencies and tenant controls, after hour usage and leasing benefits; diffusers for subdividing space

- Centralized approach that brokers understand for larger buildings, less roof area, lower maintenance, more efficient but higher first cost
- Fan coil system: higher first cost; efficient; little space required and less impact on floor to floor height
- Chilled beam: quiet, efficient, shallow and aesthetic
- Heat pumps: suburban office benefits, medical tenant benefits, what is a heat pump? Low first cost, high maintenance cost, noisy, can be efficient, least mechanical space needed
- High Rise Approach: low first cost, low space requirements, build as you go, high comfort level, metering and the tenant benefits for costs vs. landlord
- Other considerations: zoning, metering and perimeter heating that impacts tenants comfort, perimeter offices, module layouts, winter vs. summer sun issues, energy costs to tenant and the leasing decision
- HVAC for Laboratories: Safety, air changes, fume hoods, acoustics, neighbors, 24/7 operations, energy consumption, security and building height
- Key issues of concern to brokers: due diligence on quality of existing conditions: comfort, capital cost, operating cost

5. Electrical: What Does It Include? Power, Lighting, Fire Alarm (15 mins)

- Key terms for brokers: Watt, kilowatt, kilowatt hour, foot candle
- How electrical is critical to tenant's requirements on lighting for employee, equipment and employee productivity
- Lighting and fire alarm: light levels, fluorescent, LED's (light emitting diode), photocells, dimming, emergency lighting, and heat generator, A/V (audio/visual) strobes and fire alarm panel. Impact to medical and office tenant occupancy issues.
- Backup power: generator, UPS (uninterruptable power source), server room, etc. and impact on tenant computers, blackouts, mill space occupancy, downtown and suburban office tenant needs, after hour usage

6. Plumbing (5 mins)

- Water conservation and liquid waste
- Medical tenants, lab tenants and general office tenant users

7. Fire Protection (5 mins)

- Sprinkler system: heads, insurance requirements for landlord, tenant needs, water curtains
- Protecting office equipment and people, wet vs. dry vs. foam

8. Controls (5 mins)

- Pneumatic, electric, DDC (direct digital control)
- Head-end, web-enabled, lighting controls
- Tenant computer needs, server, cell phone reception issues
- Key issues of concern to brokers: ability to manage/track operations

9. Low Voltage (5 mins)

- Security
- Closet considerations such as size, spacing, cooling, efficiency
- Brown out issues to tenants

10. The Site: Parking, Zoning, Environmental (10 mins)

a. Parking: Tenant/market parking requirements vs. zoning requirements

- Handicapped and loading
- Covered vs. surface and cost to tenant
- Lighting and security and impact to tenants with after-hour usage

b. Zoning: allowed uses, setbacks, height, variances and noise ordinances: impact to the leasing process and contingencies in LOI's (letter of intent)

- Permits: impact to LOI drafts: building vs. zoning vs. sub (electrical, etc.)
- Key issues of concern to brokers: Is intended use allowed?
- Conservation commission, planning boards, special permits, Chapter 91

c. Environmental: 21E, wetlands, storm water control/impact on LOI contingencies, occupancy timing and tenant needs

REFERENCES:

- "Mastering Office Leasing": Society of Industrial and Office Realtors
- "Flat, Hot and Tired" by Tom Friedman