Homework 1:

Annotated Drawings and Outline Specification Supporting Integrated & "Comprehensive" Design Principles

Background

The National Architectural Accrediting Board, Inc.'s criteria for the knowledge and skills of graduates of architecture programs is divided into three 'realms,' one of which is entitled "Integrated Building Practices."

1. Within this 'realm' the criteria state that an graduate must demonstrate an ABILITY to produce a "comprehensive architectural project."
2. Part of the evidence of this ability is to document design decisions about a building with an understanding of the principles of environmental systems in general as well as a more detailed understanding Structure, Skin, and Services.
3. Evidence of this ability is also shown by documentationi of an understanding of the principles of selecting construction products, components, and assemblies.

The purpose of this assignment is to understand the requirements to show an abiltiy to produce a "comprehensive architectural project."

The hypothetical context of this assignment is:

1. The design problem supposes that the principal fo the firm has returned from an "integrated buidling charrette."
2. The sketch plans reflect the principal's understanding of the desired architectural concept resulting from the charrette.
3. The principal stated that the charrette's principal goals for the project are:
   Accessible Design - Incorporate Universal Design Principles
   Aesthetics - Engage the Integrated Design Process
   Sustainable Design - Optimize Energy Use, Use Environmentally Preferabel Products, Enhance Indoor Enviormental Quality
4. The principal instructed you to put a package together for the estimator.

Drawing Work:

Do a technical drawing of the following using 11" x 17" paper

1. Plan: 1/8" = 1'-0"
2. Elevation: 1/8" = 1'-0"
3. Section: 1/8" - 1'-0"

Account for architectural elements and their dimensions accurately

Annotate the drawings to highlignt your selected commentary from your Uniformat II - based outline specifications

Question to Answer:

Do a technical description of your building based on CSI's 'Uniformat' classification system

Background

1. According to the Construction Specifications Institute (CSI): "UniFormat, a publication of CSI and CSC, is a method of arranging construction information based on functional elements, or parts of a facility characterized by their functions, without regard to the materials and methods used to accomplish them. These elements are often referred to as systems or assemblies."

2 According to the General Services Administration's Estimating Guidelines: "Uniformat estimating applies unit-cost data to building-system and component site elements. This “systems” approach uses a hierarchical structure of cost elements, beginning at Level 1 with basic systems, such as Substructure, Exterior Enclosure, and Interior Construction, and proceeding to successively more detailed subdivisions of these systems at Levels 2-5. The resulting levels of detail not only serve to structure cost information but also facilitate estimates to whatever level of detail the design team can provide as the project is developed through the design submission phases." For example, by the final concept design phase, the design team and estimator may have Level 4 information on Substructure, but only Level 2 detail for Interior Construction."

3 A summary of the Uniformat work breatkdown structure can be found at: http://www.wbdg.org/ndbm/uniformat.php

4 Pointers for details for the sections of the classification system are on that web page

Specific Requirement

1 Describe the building in terms of Uniformat's breakdown: Substructure, Shell, Interiors, and Services

2 Be as specific as possible about the building

3 Cross reference your descriptions to the notes on your drawings

4 An example of a description, from an older version of Graphic Standards, is included with this assignment. Note: it does not follow Uniformat II. You assignment should follow Uniformat II. This example shows a way to describe systems as a clear, succinct, text.

Criteria for marking this homework

General Criteria

This Homework counts as 12% of your marking for the course
Homework will be marked from '4' to '0.'
Answers to questions count as 1/2 of the mark for the homework
Drawings designed count as 1/2 of the mark for the homework

Criteria for Answers to question

General:

The response to this question is written
This written response is succinct, clear, and informative

Requirements for a mark of '4' - Building systems described at Uniformat Level 4
Requirements for a mark of '3' - Building systems described at Uniformat Level 3
Requirements for a mark of '2' - Building systems described at Uniformat Level 2
Requirements for a mark of '0' - Building systems described at Uniformat Level 1

Criteria for quality of drawings

General:

Drawings are evaluated in terms of completeness, accuracy, and legibility

Requirements for a mark of '4' -

Work product capable of being incorporated into a project using building information management.

Requirements for a mark of '3' -

Work product could be submitted to an outside consultant (in this case, a cost estimator).

Requirements for a mark of '2' -

Work product could be used to present an idea to a colleague within the office

Requirements for a mark of '0' - Minimal drawing

STRUCTURAL

Frame:	Steel, with welded and bolted connections (F)
Roof:	Steel decking welded to frame (A)
Floors, upper:	Steel decking welded to primary frame members, with cast-in-place concrete topping (M)
Floors, basement:	Slab on grade, with concrete foundation (O)
Core:	Central service core of cast-in-place concrete

Principal advantages and characteristics: Core shear walls add rigidity to frame; composite action of structural steel framing and a steel and concrete floor diaphragm result in relatively long, uninterrupted clear spans with smaller depth of construction. Heights can range from one to more than 100 stories. System allows for off-site fabrication of frame components, easy shipping to site, and rapid assembly; corrugated steel deck becomes a working surface as soon as it is placed and provides formwork for concrete topping.

ENVELOPE

Roof:	Built-up roofing or single-ply membrane on rigid insulation (B)
Walls:	Curtain wall units of glass/frame assemblies (E) and insulated spandrel panels (I), attached to structural frame
Basement:	Waterproofing and protective board, with foundation drain (N); vapor barrier under slab (P)

Principal advantages and characteristics: The envelope is structurally independent of the steel frame, providing flexibility in weight, size, and configuration of the envelope system. Curtain wall units preassembled at the factory must be designed with shipping, storage, installation, and general handling in mind, emphasizing protection from damage at all stages.

MECHANICAL

HVAC:	Ducts, with diffusers, either suspended from structure in ceiling plenum or placed in floor plenum beneath access floor (D)
Electrical and telecommunications:	Electrical wires and cables placed mainly in access floor plenum and structural/electrified floor (H); can also be located in ceiling plenum, for lighting, and in interior wall at spandrel panel
Plumbing:	Most plumbing functions placed in core area for efficient vertical circulation of systems
Fire safety:	Sprinkler system suspended from structure in ceiling plenum

Principal advantages and characteristics: Mechanical systems, hidden in floor or ceiling plenums or both, can be accessed through removable panels in ceiling or floor systems.

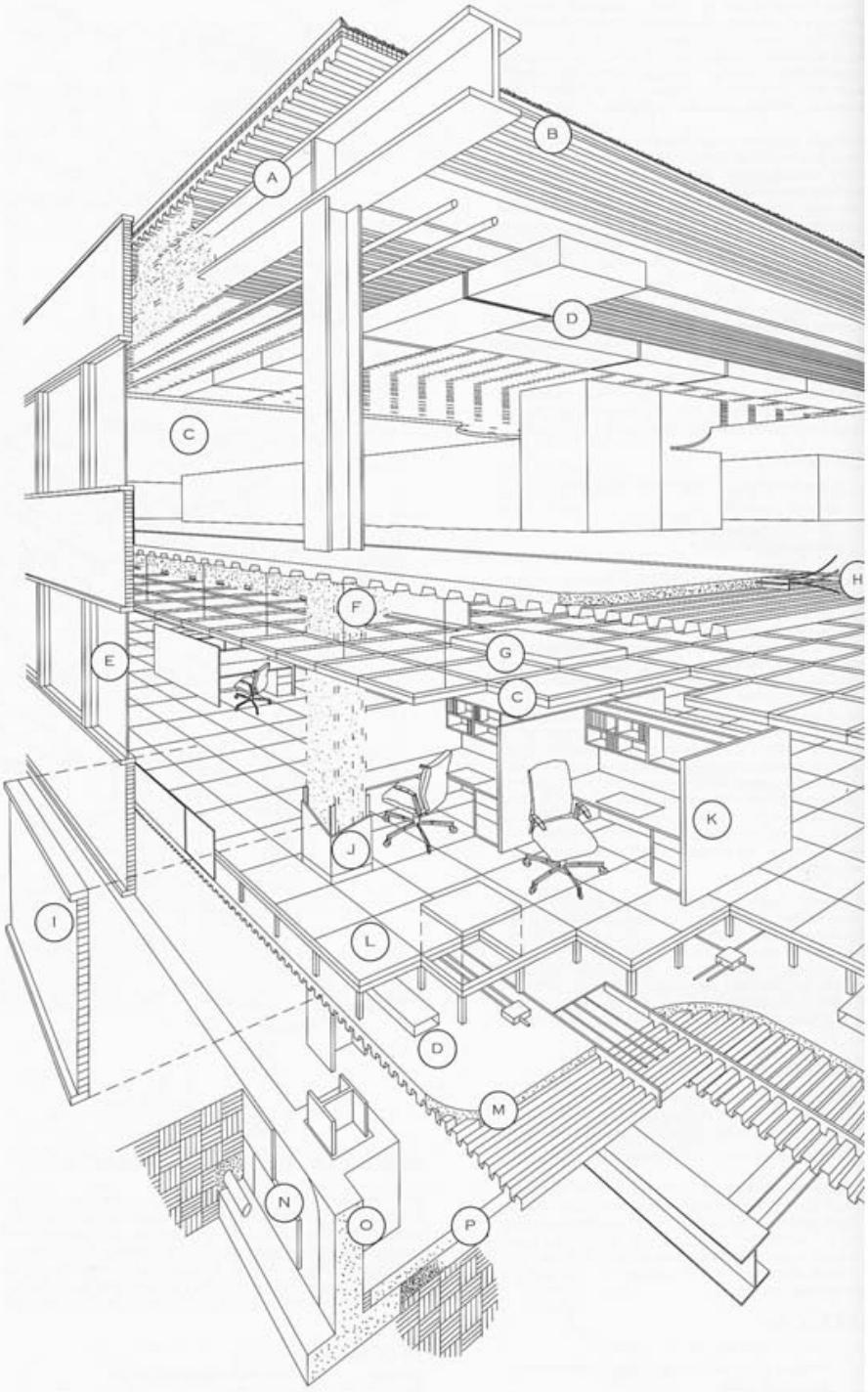
INTERIOR

Ceilings:	Suspended acoustical tile (C)
Floors:	Carpeted access floor system (L) and structural electrified floor (H)
Walls:	Gypsum wallboard (J)
Lighting:	Fluorescent light fixture in ceiling (G) and natural light (E)
Furnishings:	Open office furniture (K)

Principal advantages and characteristics: Suspended ceiling provides space for distribution of internal services, but it tends to be used principally for overhead lighting and ductwork. Structural/electrified floors and access floor systems keep all wires and cables in space below finish floor, easily accessible by removable floor panels, allowing high degree of flexibility for interior environment. Buildup of static electricity and the ensuing risk of equipment damage and shocks need to be considered. Access floors are not suited to situations involving heavy point loads or shifting heavy equipment. Stringerless systems are among the most flexible and least costly varieties, but they lack the stability of fully gridded systems and depend on perimeter walls for restraint. Use of access floors as air plenum, requiring tight and uniform joints between access panels, may hinder access to wires, cables, and pipes; ductwork in floor plenums may eliminate the advantages of access floors by blocking the path for wiring, cables, and pipes.

SYSTEM SUMMARY

Steel frame and curtain wall construction allows for off-site fabrication of frame and envelope components, easy shipping to the site, and rapid assembly at the site. The steel and concrete in the floors are designed to act as a composite diaphragm, providing a thin, lightweight structural element with or without an access floor. The access floor shown is advantageous in office environments that need especially flexible interior layouts. This system keeps all wires and cables in the space below the finish floor (usually not less than 4 in. deep) and out of wall cavities. Although access floors may add to overall floor-to-floor heights, the access floor conceals the most visually intrusive distribution elements.



STEEL FRAME WITH ACCESS FLOOR AND CURTAIN WALL

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Based on The Building Systems Integration Handbook, by Richard D. Rush, AIA (John Wiley & Sons, 1986)