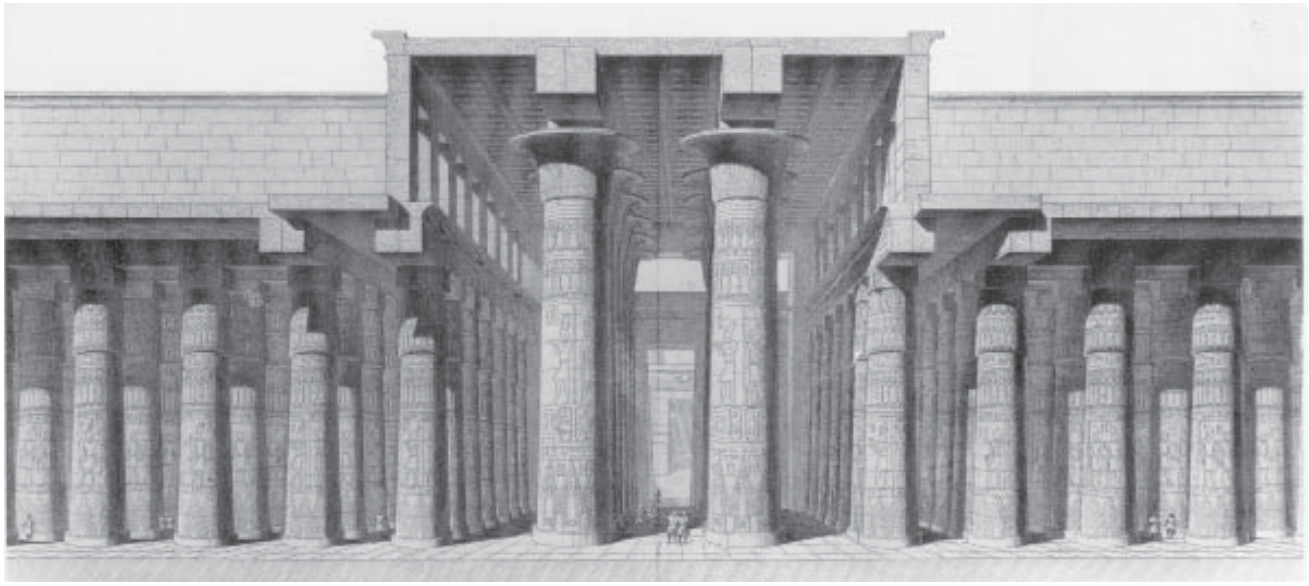
hypostyle hall:too many columns introduction

wS 2010: Universität für Angewandte Kunst, Wien, o. Univ. Prof. Greg Lynn
assistants: Kristy Balliet, Justin Diles, Johannes Meucke, Martin Murero



Hypostyle Hall:

The studio will design a terminal this semester using the typology of the Hypostyle Hall. A Hypostyle Hall is an interior space or volume with at least one row of longitudinal columns running down its center. A Hypostyle Hall should not be confused with a Basilica which can have two rows of columns running longitudinally down its center making a central space. The only Hypostyle Hall with two rows of columns on center is one in which the spacing of each of the bays made by the columns are equal or when the spacing between rows of columns in the central space is less than the spacing between the row of columns and the outer walls. This is all to say that the epitome of any Hypostyle Hall is a field of columns and not a volume defined by columns. Many examples of Hypostyle Halls are entered through Portico(s) or Colonnade(s) but this is not necessary. You will be asked to identify 32 different building plans as either: Basilica, Portico, Colonnade or Hypostyle Hall and will continue to try this until you have done it without any errors so that we all understand and discriminate between the spatial principles without confusion or alternative interpretation.

Because Hypostyle Halls are defined by columns we will also begin with a few ideas about columns. Columns have historically had bases, middles and tops. They also have used Entasis where they taper along their length to simulate the distortion of perspectival vision. Columns can diminish in their spacing and in their height to simulate and distort or force perspective. Solomonic Columns are twisted in spirals making a more figurative and dynamic space between themselves. You will also be asked to identify these variations between column types. Columns are classically characterized by Greek orders: Doric, Ionic and Corinthian; Roman orders: Tuscan and Composite; Arabic and Gothic variations as well as Modern column types invented by Mies, Horta, Sullivan, Rietveld, Nervi and Trucco to name a few. We will not be particularly concerned with the figurative quality of the columns.

Hypostyle Structure:

We are not as concerned with structural expressionism as the volumetric and spatial character of the terminal. However, one of the key results of a hypostyle hall is the reduction in depth of spans due to the regularity and density of columns. So the project need not be a long span structure and therefore the emphasis on celebrating structure is not as necessary as in previous long span terminal halls.
Remember last year's work and be conscious of whether your projects are invested in either "Intricate Tectonics" or "Composites".

Finally, a very minimal concern will be given to the facades and it is our hope that the façade design will be informed and guided by the section and column design ideas. The main focus for the facades should be some idea about colonnade, portico or a hypostyle hall extended to a perimeter.

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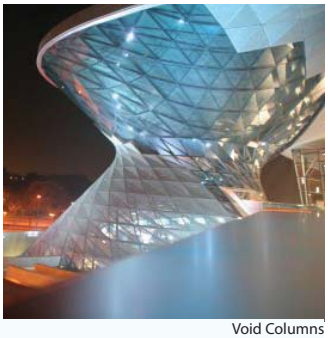
Piloti


Spider Columns


Flared Columns


Cocktail Sticks


Void Columns

Recent Innovations in Columns:
Of course we are in the business of innovation but it is impossible to do something new if you don't know what you are doing and this is why we will go through the analysis and classification of these precedents above. In terms of recent history and contemporary precedents there are perhaps five paradigmatic ideas that we should be aware of that have no, and perhaps have never been applied to, Hypostyle Hall typologies; and these are:

The first is the invention of the **Piloti** as opposed to the column. A Piloti is not different than a column, in fact it is a column with a difference. Columns align along structural or spatial grids where Piloti can be moved anywhere and need not align horizontally in lines or girds or vertically aligned carrying loads perpendicular to the ground. Ever since Corbusier's definition of the Piloti it has been used for spatial innovation the most resplendent of which are Rem Koolhaas' library projects of the 1990s.

The second is the invention of the **Spider Leg Column** by Richard Neutra where the column is extended outside the limit of the roof or parapet and is connected to the space of the building by a beam. Since its definition it has been used with great success, even on interior spaces with virtuosity by Peter Eisenman beginning with his "L" Houses where spatial and formal rotation was introduced through their use rather than simple spatial extension.

The third **Flared Columns** are referred to with a variety of terms such as Dendriform, Tree or Mushroom Columns and are epitomized in Frank Lloyd Wright's Great Hall in the Johnson Wax Headquarters or Pier Luigi Nervi's Palace of Labor. Common to all of these Flared Columns is the formation of a vault like space between columns rather than beams. Recent variations of these flared top columns include the Stuttgart Train Station by Ingenhoven Architects. Where Wright and other architects blended the column with the ceiling, recently, architects have looked at filleting or blending the column bases with the floor as well.

Fourth is the rather whimsical definition of **Cocktail Sticks** where instead of a grid of normal columns a surplus of slender columns, often without vertical orientation is used. These fine grain fields of columns are said to have been derived from constructivist precedents but in fact were rampant around the time of the Deconstructivist Architects Exhibition at the Museum of Modern Art and were best exemplified by Daniel Libeskind and were later adopted by Zaha Hadid and Rem Koolhaas in some of their projects. In fact, this variant might best be understood as an extreme version of Piloti by some but we will give it a distinct character and category. In projects such as Preston Scott Cohen's Competition Entry for the Eyebeam Museum these excessive and oblique columns are refined with great success spatially and experientially.

Finally the fifth contemporary column is the **Void Column** where instead of a solid mass the column becomes enlarged and defined as a hollow envelope or shell. The paradigmatic examples of this are Toyo Ito's Sendai Mediatheque and Wolf Prix's Double Cones such as the volume at the corner of BMW Welt. Jurgen Meyer's canopy in Spain might be considered one of these or it might fall within the category of Flared Columns but ever since Ito's project there has been lots of design attention paid to enlarged and occupied Void Columns.

All of these examples are of the design of columns and have nothing to do with Hypostyle Halls per se so please understand that this is just to show innovations and inventions as to column types that you should be aware of. However, we are asking you to have an idea about Hypostyle Halls initially and this may or may not be related to any of the five columns above.

hypostyle hall:too many columns site/program

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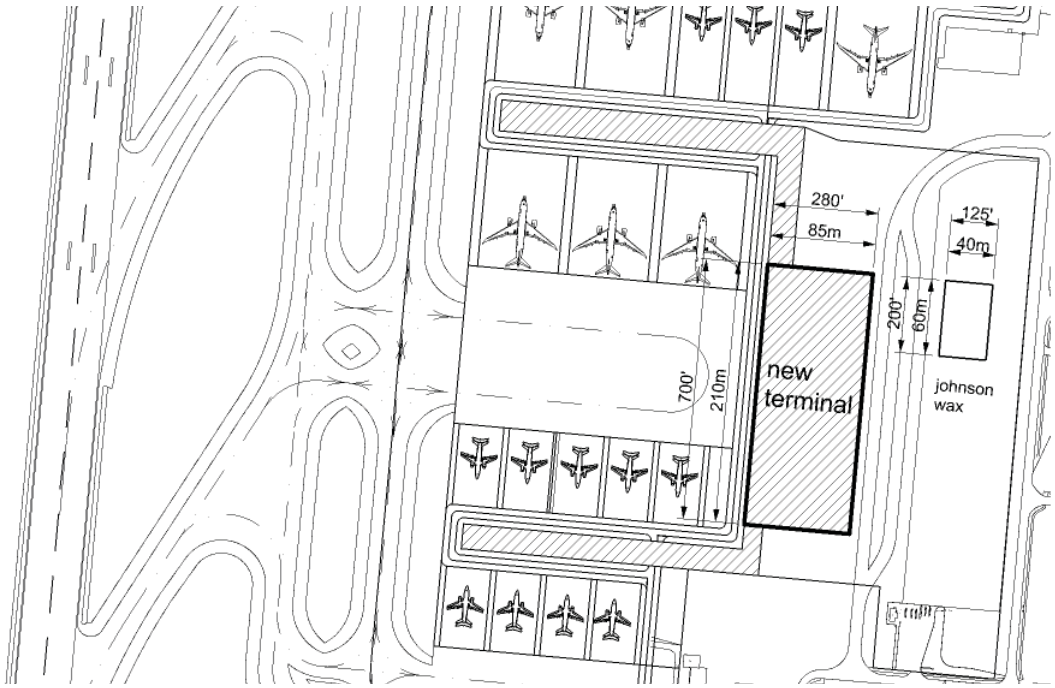

The program and site for the project take advantage of an architectural competition for the design of a new terminal for the Riga International Airport. The location of entries, drop-offs, roadways, gates to the airplanes, runways and all massing and master planning decisions will remain intact. What will change is the spatial and volumetric interior of the terminal. The exterior façade and roof design can be changed but only within the existing massing envelope and as long as entries, gates, drop-offs, services and the master plan in general remains unchanged. The New Terminal Design is exclusively for "airBaltic" Airlines. The overall expansion is approximately 60,000 m^2, but we will focus on the **New Terminal Hall: 34,000 m^2**.

More detailed program and site information to follow.

You will apply the spatial concept and method of the Hypostyle Hall to transform this design which is based on a translucent, extensive, gridded space of transparency with the exterior and with the jetway. One of the major trends in airport terminal design worldwide is a shift from the internally focused halls of the 1960s and 1970s (for example Eero Saarinen's TWA Terminal 5 at JFK, Paul Andreau's Terminal 1 at Charles-de-Gaulle, I. M. Pei's JFK Terminal 6 or Eero Saarinen's Main Terminal at Washington Dulles) to transparency to the tarmac where one is oriented to the gates and runways and can watch planes departures and arrivals. Previously Halls were either designed with the concept of porticos to the drop-off and pick-up entries or they were designed as basilicas with a large void space surrounded by columns. More recent designs by SOM and Norman Foster in particular continue these typologies only with an emphasis on colonnade views to the runways and gates.

For this semester you will use the density and lack of a central void characterized by the hypostyle hall. By using piloti, spider leg columns, flared columns, cocktail sticks or void columns combined with the spatial character in plan of the hypostyle hall there are many new design opportunities for the terminal that include:

- Rooms in columns
- Building system perforating the section and plan
- Security throughout the space
- Gateways and entries from the middle rather than perimeter
- Daylighting
- Way-finding

hypostyle hall:too many columns first task

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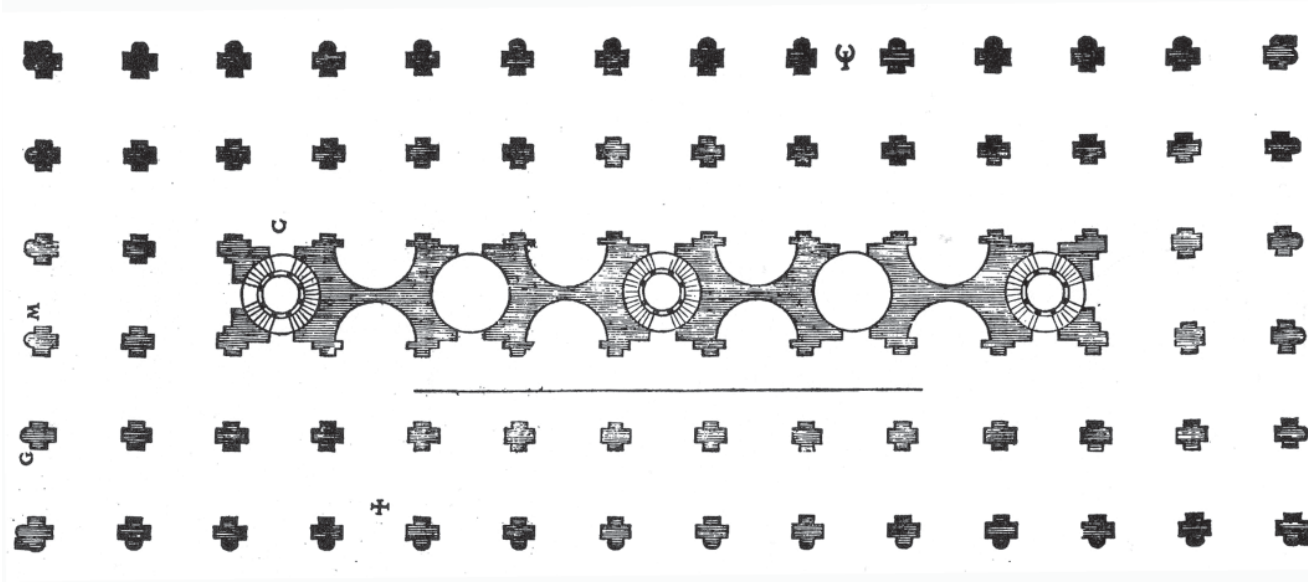

Drafted 2D Drawings:

You will work in teams and each project will begin with four drawings: a Building Plan through the entire ground level showing programmatic elements and spatial sequences through the building; a Reflected Ceiling Plan showing volume, day lighting (roof apertures), building systems and structure; a Building Section showing the spatial and volumetric character of the space across its entire extents; and a Section Detail that isolates two or more adjacent columns and shows their spatial character. The plans should show both the functional and organizational character of the terminal as well as the hypostyle quality of the project. Again, there should be only minimal change to the existing planning of the new terminal as this is an architectural transformation based on Hypostyle Hall typologies and not a space planning or functional adjacency studio experiment. Assume the massing and adjacencies have already been completed by ADPI Designers and Planners and that you have been awarded the architectural commission (the way it will most likely work for you when you get your first airport terminal commission in the future). The section should show the hypostyle character of the space and the building volume(s). Finally the section detail should show the intricate tectonic or composite character of the design.

Geometry and 3D (model):
A sample model showing a column, floor and ceiling will be required at a large scale in the first few weeks.

Schedule First 4 Weeks:

05.10.10	tu	2-6	Semester Kick Off and *Hypostyle Lecture
07.10.10	th	1-3	*Column Lecture
12.10.10	tu	2-6	*Airport Lecture / Desk Crits
14.10.10	th	2-6	Desk Crits
19.10.10	tu	2-6	Desk Crits
21.10.10	th	2-6	Desk Crits
26.10.09	tu	//	National Holiday
28.10.09	th	10-	**Review** with Greg (Visual Catalog Book Presentation 7pm)

31.10.10-08.10.10 Study Trip (Rome + Pompeii, Paestum, Naples, Capri)

hypostyle hall:too many columns Precedents

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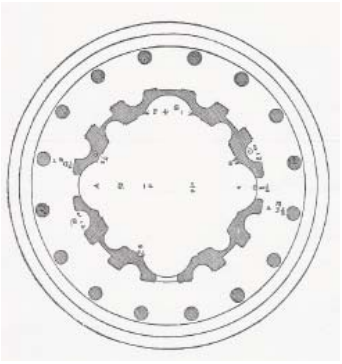
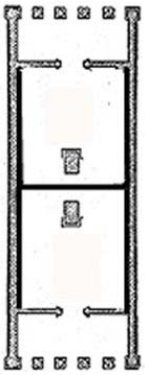
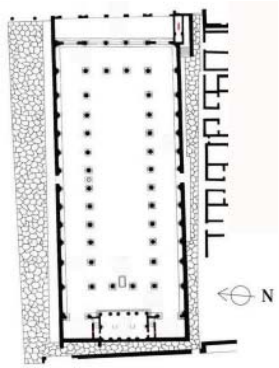


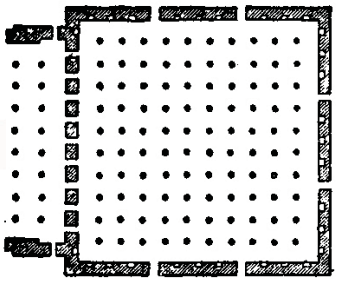
Colonnade



Portico



Basilica



Hypostyle Hall

Colonnade:

Temple of Apollo, Didyma (Didim,Turkey), 300 BC
Stoa of Attalos, Athens, 150 BC
Foundling Hospital, Brunelleschi, Florence, 1419
empietto, Bramante, Rome, 1502
Palazzo Farnese, Sangallo the Younger, Rome, 1515
Piazza of St. Peter's Cathedral, Bernini, Rome, 1667
Louvre Palace Colonnade, Perrault, Paris 1670
Lake Shore Drive Apartments, Mies van der Rohe, Chicago, 1951

Portico:

Temple of Athena Nike, Acropolis, Athens, circa 430 BC
Temple of Portunus, Rome, 75 BC
Pantheon, Rome, 126
Temple of Venus and Roma (upper level), Rome, 141
Pazzi Chapel, Brunelleschi, Florence, 1429
Villa Rotonda, Palladio, Vicenza, 1566
Saline Royal Director's House, Ledoux, Arc-et-Senans, 1775
Altes Museum, Schinkel, Berlin, 1830

Basilica:

Basilica of Pompeii, 120 BC
Basilica Ulpia_ForumTrajan_Rome 100
Basilica of Maxentius and Constantine, 303-313
Basilica di Santa Maria Maggiore, 432-440
Basilica of St. John, Ephesus, Turkey, 548-65
Church of the Saints Sergius and Bacchus, 527-536
Basilica of St. Peter's, Donato Bramante, Rome 1506
Pantheon (sans Portico), Jacques Germain Soufflot's. Paris 1758

Hypostyle Hall:

Temple of Amun (Great Hall), Karnak, 1530-323 BC
Temple of Hera I (Basilica), Paestum, 550 BC
Palace of Xerxes, Persepolis, 515 BC
Cacaberio, Rome_ Serlio Plan *reconstruction of market place
Great Mosque, Cordoba Spain, 786
Jami Masjid, Gulbarga, India, 1367
Johnson Wax Headquarters (Great Workroom), Frank Lloyd Wright, Racine Wisconsin 1936-39
Palazzo del Lavoro, Pier Luigi Nervi, Torino 1959-61