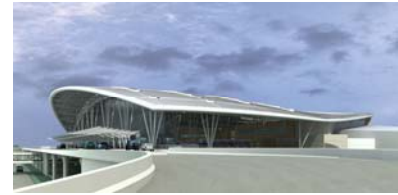


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Lighting Depth Study

Passenger Concourse (B)

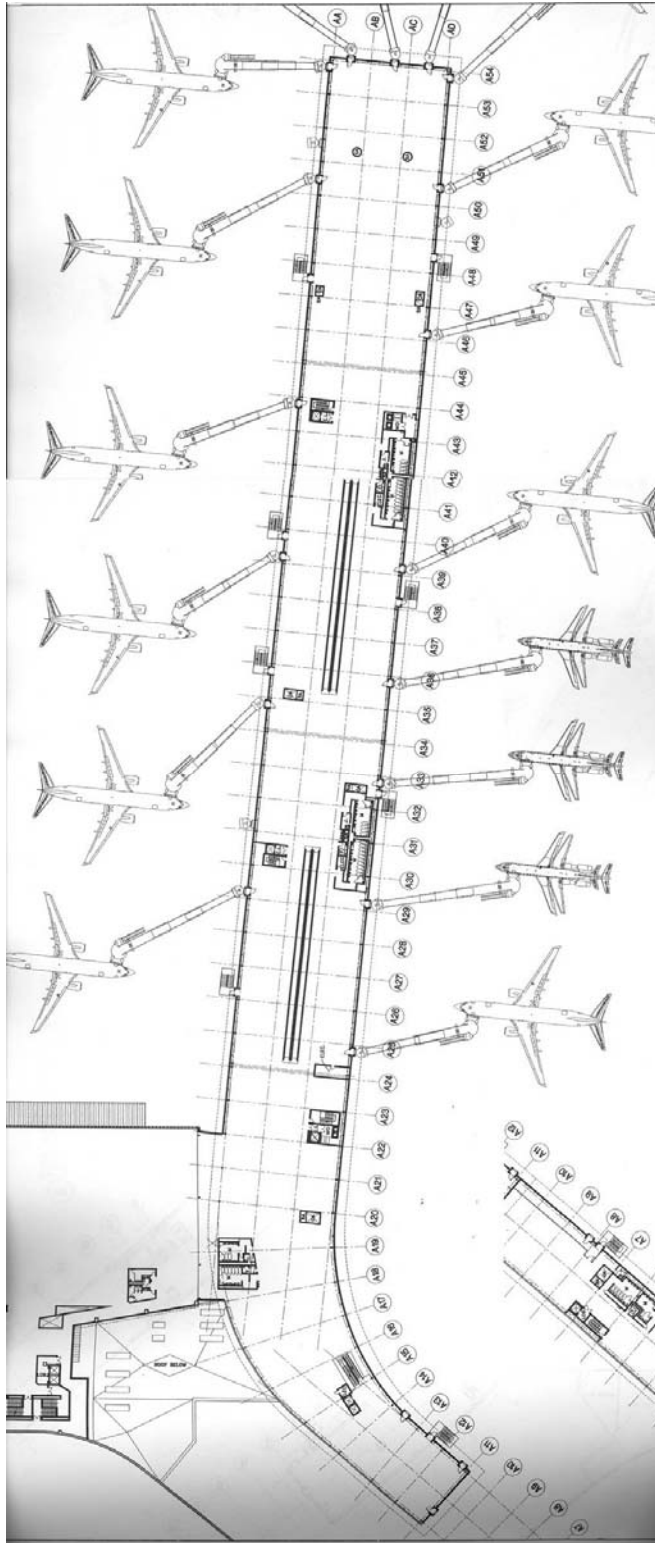
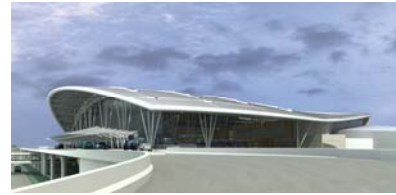


Overview

The Passenger Concourse B is one of the two identical concourses that connects to the Civic Plaza. Each concourse features 20 gates that will allow wide-body aircraft to bus. The concourse is almost divided evenly into 3 sections: seating/waiting area on both side (low side and high side), and the circulation area in the middle. With virtually curtainwall in almost every visible space, plentiful of sunlight is entering the concourse throughout the day. The concourse stretches nearly 1200 feet in length and approximately 100 feet in width, it is divided into the long side and the short side (near Civic Plaza Connector). Thanks to the modularity of the Concourse design, it is evenly divided into 4 modular sections, therefore, all studies for this space will be focused on only one modular section.

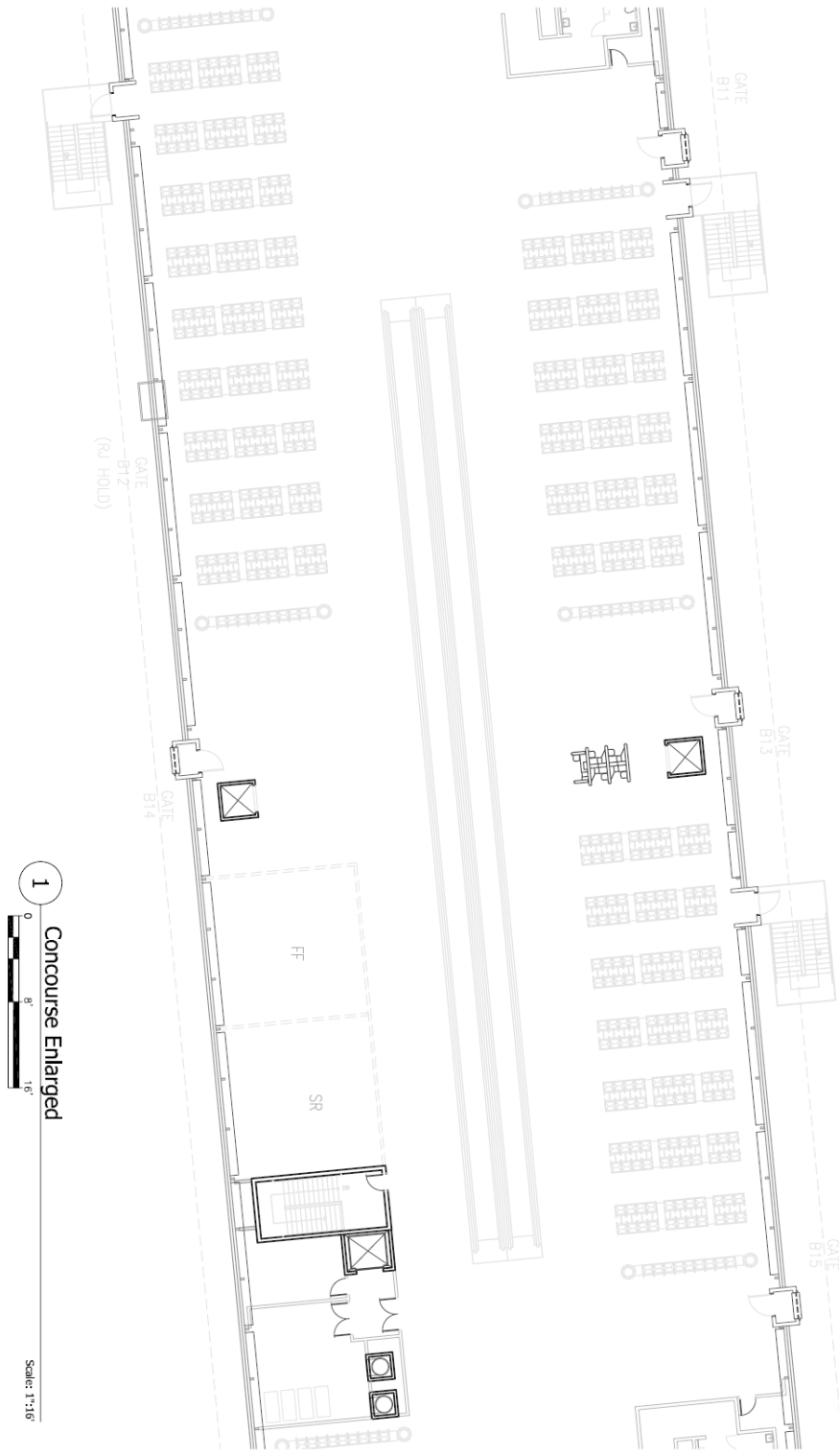
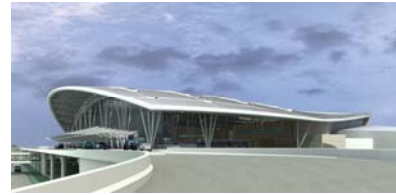
Plans and Sections below will give you a general overview of this space:

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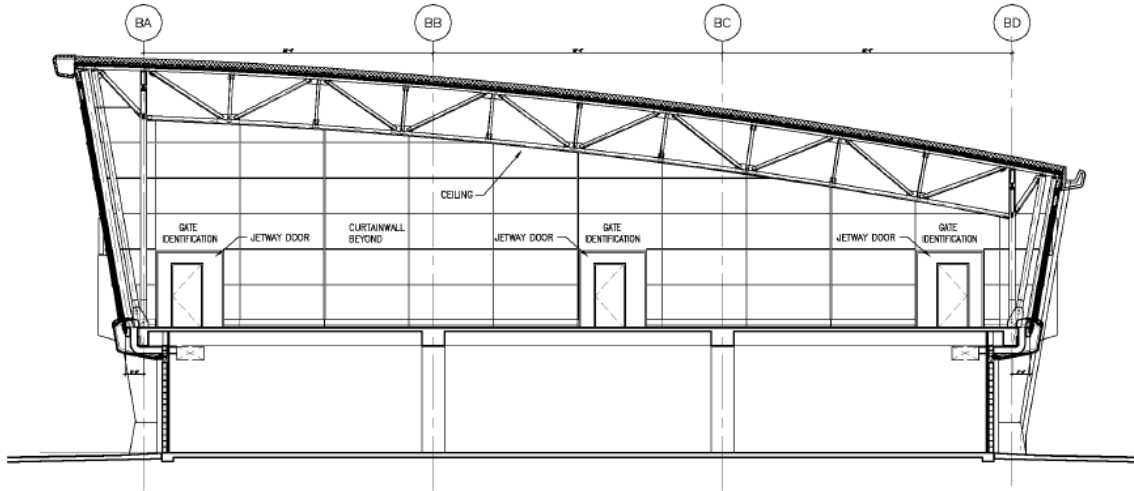
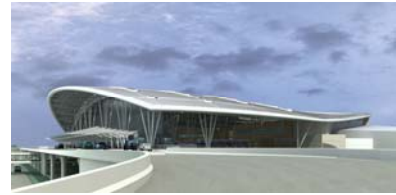
Overall Concourse Plan

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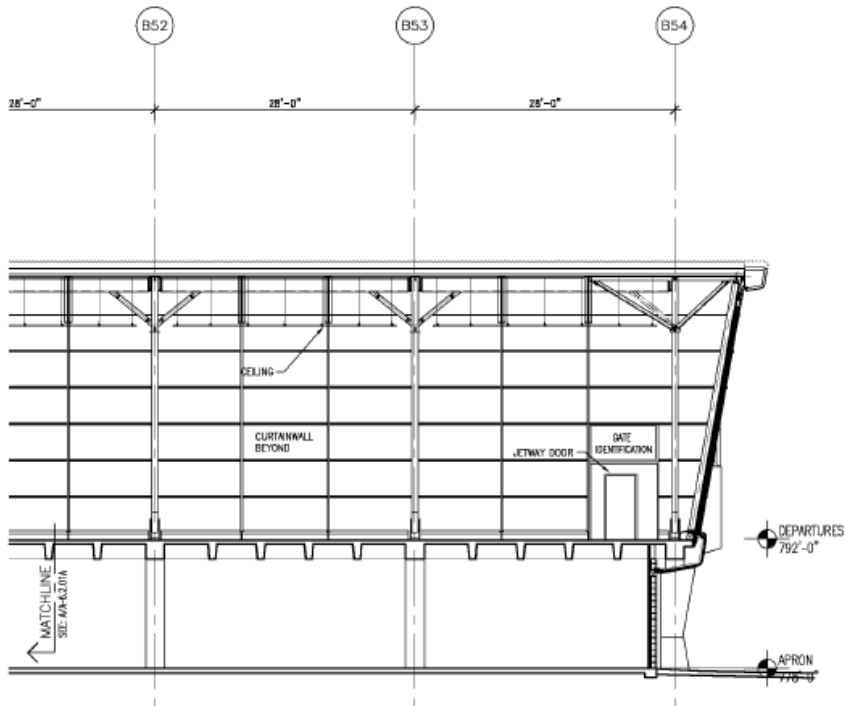


Enlarged Floor Plan (Module)

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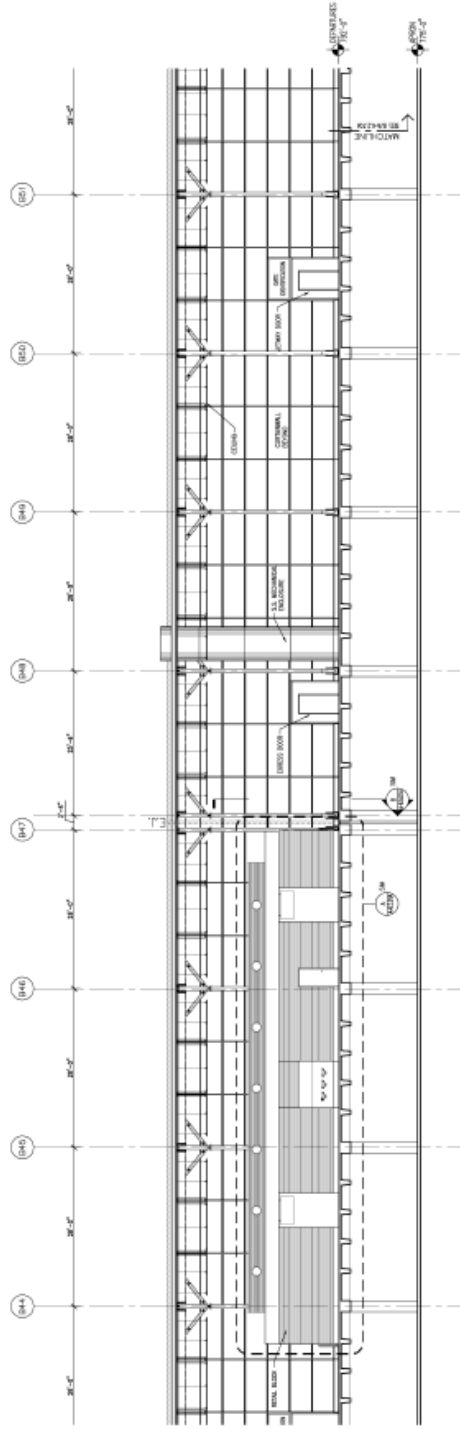
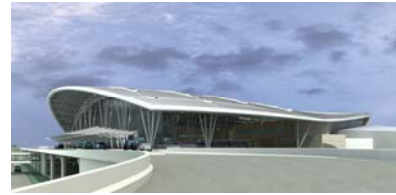


C PARTIAL INTERIOR ELEVATION
1/8"=1'-0"



B PARTIAL INTERIOR ELEVATION
1/8"=1'-0"

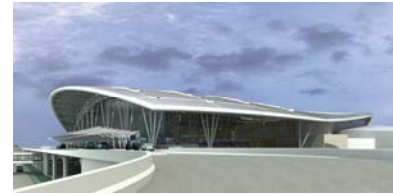
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(A) PARTIAL INTERIOR ELEVATION

Partial Interior Elevation

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Design Goal

To design a concourse that retains the continuity from the previous spaces. A fluidic concept shall creating visual interest in this long and repetitive space, at the same time without damaging views of both side of the Concourse. Address and resolve major glare issues due to the openness of this space. Appropriate actions such as installing operable blinds should be performed for such task.

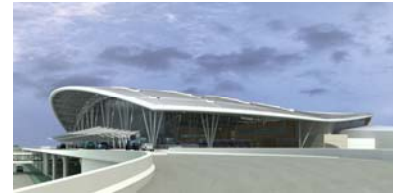
Design Criteria

1. Appearance
 - Appearance of space and luminaires is important that must ensure luminaires are properly integrated into signage and not interfere with VDT displays, as well as keeping a pleasing, non-clustered appearance. Airport concourses is a highly stressful space to be dwell in, whether it is resulting from traveling fatigue-ness or flight delay frustration, it is important to create a highly comfortable and visually pleasing or at least, interesting ambience.
2. Color Appearance
 - Color appearance and color contrast is very important considering that an appropriate level of illuminance ratio should be established for the application of task lighting while maintaining an acceptable contrast ratio for circulation.
3. Uniform Light Distribution
 - Light distribution (uniformity) on surface is very important for this space because of the extensive task application is involved.
4. Direct Glare
 - Direct glare is very important and must be avoided in order to provide maximum end user visual comfort; curtainwall must be properly shielded from direct sun glare.
5. Reflected Glare
 - Reflected glare is very important, and should avoid it from occurring on VDT displays at check in counters as well as flight info screen areas.
6. System Control Flexibility
 - System control flexibility is highly important, due to the need to constantly adjust the light level with the outside weather or to switch between preset appearances of the space for passenger comfort. (not included in this study)

Daylighting Design Criteria

1. Quantity
 - Minimize heat gains throughout the year.
2. Quality
 - Provide ambient lighting requirements of 30 fc for the perimeter zones of the concourses. This is a 45' deep zone on the high side of the concourses and a 25' deep zone on the low side of the concourses.
 - Minimize glare and large contrast ratios throughout the year.
 - Provide a uniform daylight distribution, balancing with electric lighting if necessary to create a uniform luminous environment.
3. Cost/Integration
 - Minimize cost and complexity of the daylighting design while maintaining quality.

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Design Concept

The existing passenger concourse has an extensive daylight system that utilizes high performance curtain wall on both high and low side of the concourse. This curtain wall even runs continuously throughout the long and short side of the concourse. Hence, during daytime, even under an overcast sky, little or no electric lighting is required. However, in order to accommodate different passenger's need (task/rest/sleep), a flexible lighting control system is already installed, allowing quick switching between preset scenes under different sky conditions.

Airport concourses is a highly stressful space for occupants to be dwelling in, whether it is resulting from traveling fatigue-ness or flight delay frustration, it is important to create a highly comfortable and visually pleasing, or at least interesting ambience in this repetitive space. A fluidic concept that retains the continuity from the previous spaces shall creating visual interest in this long and repetitive space, at the same time without damaging views of both side of the Concourse. Metaphorically, the concourse is the wings of this giant bird, where it takes off. Realistically, the wing location is matter fact, will physically take passenger off into the sky. A wing conveys the idea of motion, dynamic and streamlined.

This brings me to my idea of installing a man-made sandblasted glass tunnel along all 4 walking escalators. This man-made tunnel juxtapose a vertical contour into the elongated concourse, is uplit by in-grade LED fixtures with dynamic color changing LED lamps. Color Kinetic's iColor Cove MX is utilized specifically for this job. This juxtaposition creates an unparallel experience of how someone can walk through a space. The color lights symbolized dynamism and generate visual interest out of this concourse's monolithic appearance, no more grey aluminums columns or silver ceilings.

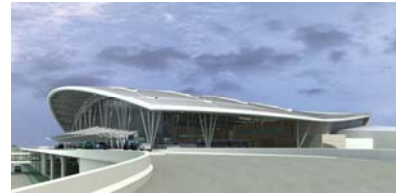
Existing recessed linear fluorescent luminaries are kept in place because it achieve an indirect, soothing ambient for the concourse waiting area. Wherever there're task areas, linear fluorescent pendant luminaries are utilized to ensure soft shadowing as well as uniformity of light distribution over the task work plane. Adjustable metal halide downlights are also kept in the circulatory area providing accent and flexibility in aiming and control.

Visual comfort also means direct/reflected glare should be avoided at all time; this means that operable blinds will be installed, because proper shielding of the curtain wall is always the most direct solution.

Shades Specification

- To install Motorized Multi-band shades for all the south-facing windows. The motorized shades ought to be opaque enough to block out the harsh morning sun, reducing the illuminance level to an acceptable and comfort level.
- To accompany the motorized shade system, the Mecho Shade's AAC SolarTrac Window Management Daylighting Manager System will be utilized and programmed together along with the lighting control/dimming system.
- Mecho Shade Euroveil 6000 Series will be utilized for this particular space.
- Shade selection based on the Mecho Shade's ShadeCloths guide on performance vs. need.
- The new shades should not obscure views to the exterior, yet maintain as a light and airy layer of screen that gently blocks out the sun.

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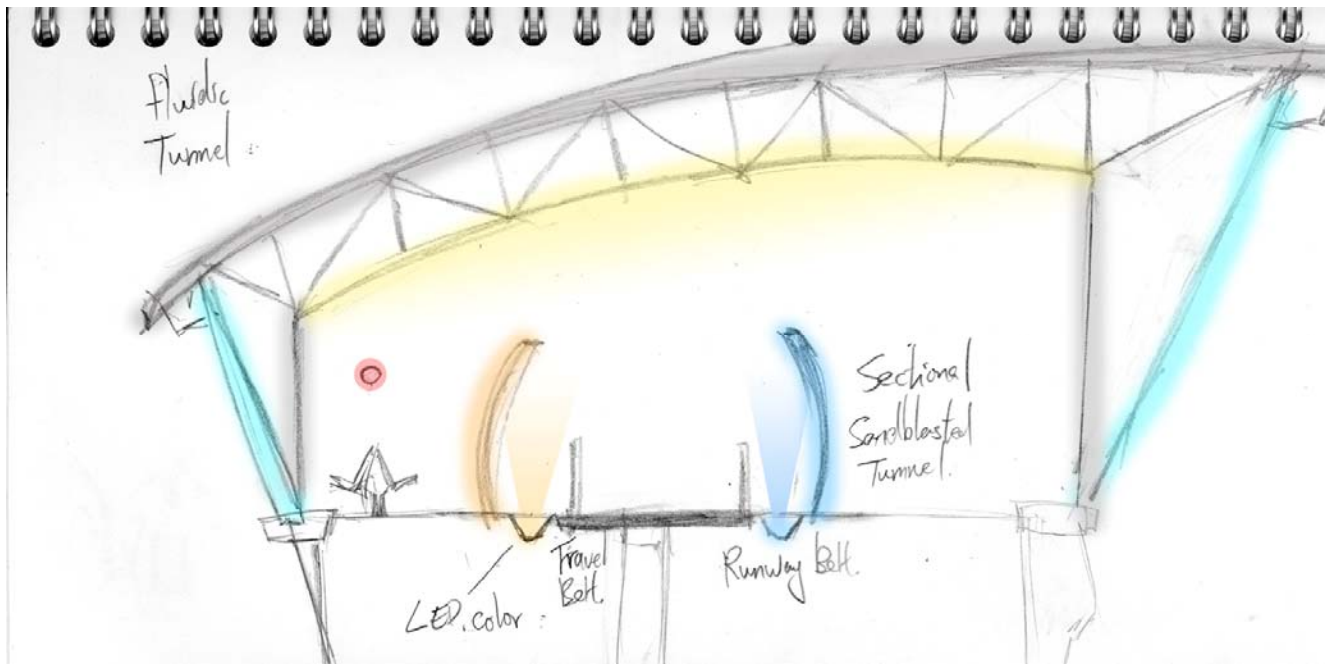
- Translucency and choice of fabric is a very essential element to this addition. The addition should not violate the architect's original design intent of bringing the outside-in, and submerge the inside-out.

Please see Appendix B for Daylighting Study on the Concourse

Please see Appendix C for Custom-Design details

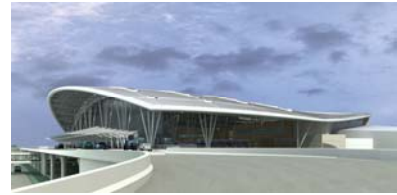
Please see Appendix D for Curtain/Blinds Specification Sheet

Schematic sketches and finalized design solution are illustrated below:



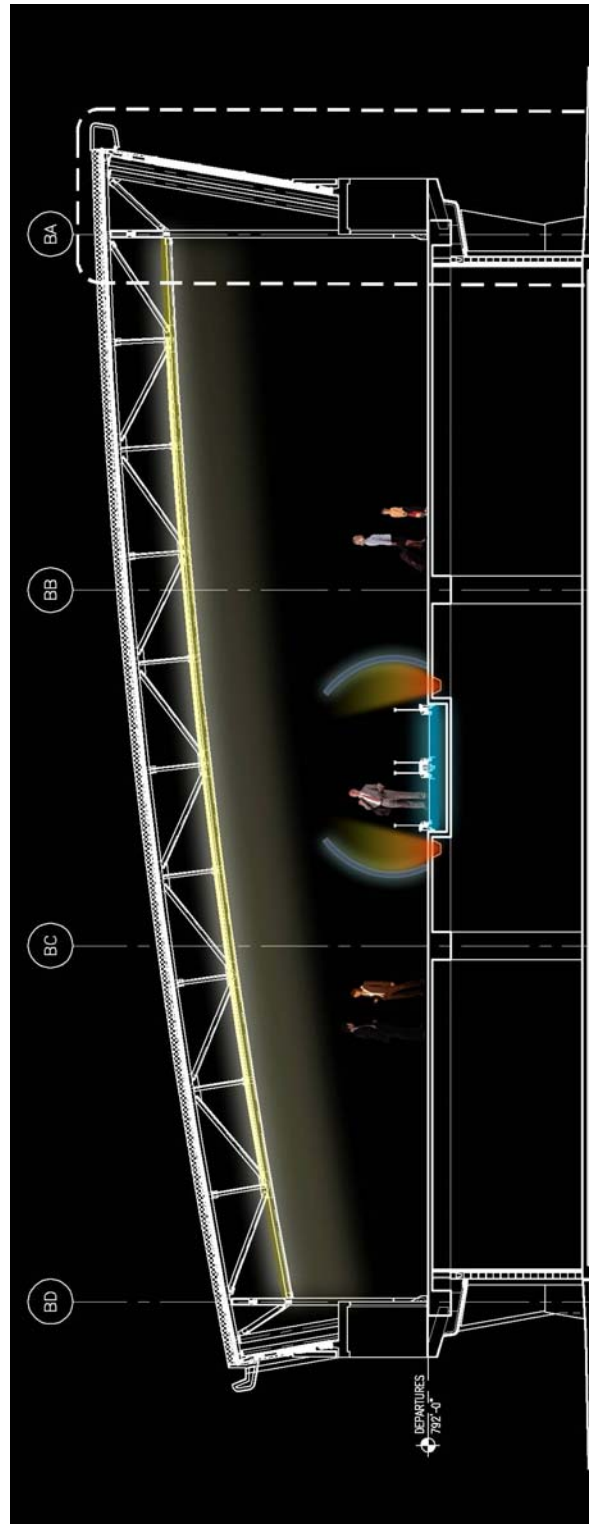
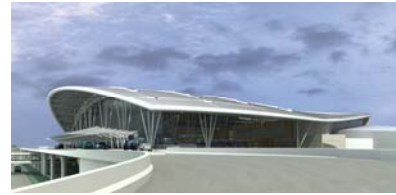
Schematic Sketch of the Ticket Hall in Plan View

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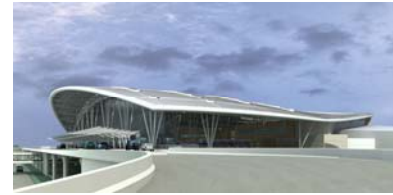
Schematic Design Proposal

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Finalized Design Solution

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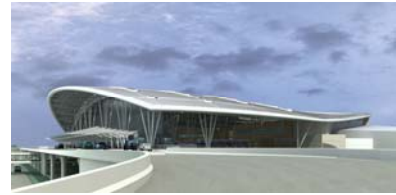
Material Reflectance

Material Reflectance Table	Exterior	Ticket Hall	Civic Plaza	Passenger Concourse
Columns (aluminum)	55%	55%	55%	55%
Curtain Wall (Glazing)	10%	15%	15%	15%
Skylight (Glazing)	N/A	15%	15%	N/A
Concrete	20%	N/A	N/A	N/A
Flooring (Marble)	N/A	30%	30%	30%
Ceiling (aluminum)	75%	75%	75%	75%
Furniture Fabric	N/A	20%	N/A	20%
Sandblasted Panels (Glass)	N/A	N/A	35%	35%
Panorama Animation Screen	N/A	N/A	60%	N/A

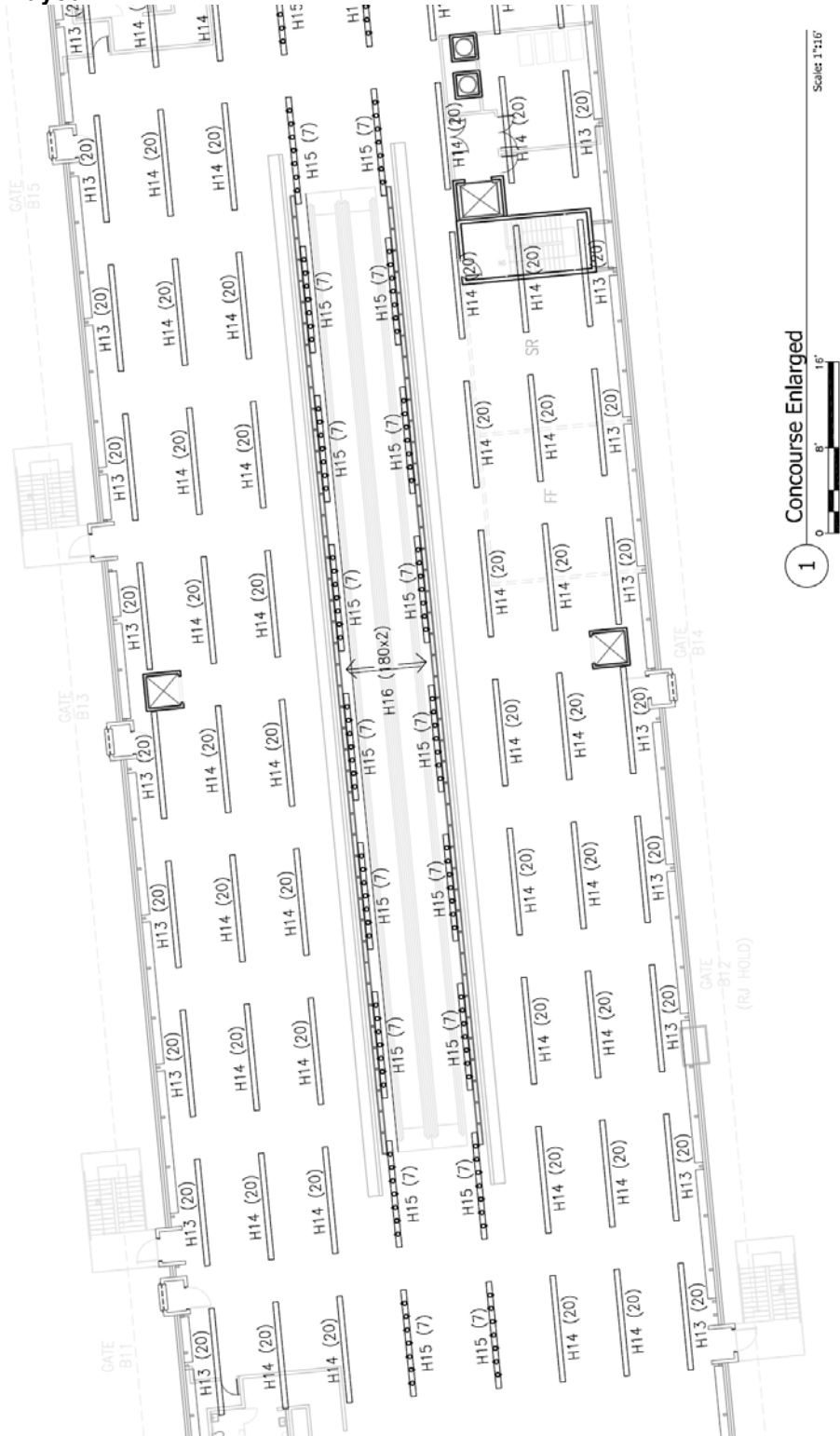
Glazing Specification

Glazing Spec		
Location	Curtain Wall	Skylight Glazing
Brand	Pilkington Solar E	Visionwall 3-element Glazing System
Type	Insulated	Insulated
Total Thickness	1"	1"
	24 mm	24 mm
Space Filler	Argon-Filled	
Outboard Lite	1/4" Pilkington Solar E™	Low E Coating (optional)
Inboard Lite	1/4" Pilkington Optifloat™	Low E Coating (optional)
Reflective Surface	2nd	n/a
Low-E Surface	2nd	n/a
Visible Light Transmittance (%)	53%	66%
Visible Lite Exterior Reflectance (%)	10%	n/a
Visible Lite Interior Reflectance (%)	15%	n/a
Total Solar Energy Transmittance (%)	33%	n/a
Total Solar Energy Reflectance (%)	9%	n/a
U-V Transmittance (%)	31%	n/a
U-Value - Summer	0.27	0.21
U-Value - Winter	0.28	0.22
Solar Heat Gain Coefficient	0.43	0.18
Shading Coefficient	0.49	0.19

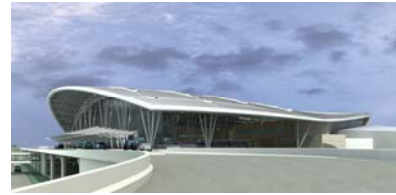
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Luminaire Layout



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Lighting Fixture Schedule

Concourse								
Fixture #	Brand	Luminaire	Lamp Type	Lamp Wattage (watts)	Lamps/Fixture	Quantity	Watts/L-ft or Watts/Fixture	Total Watts
H13	Prudential Mini Olympic	Linear Recessed Slot	Flourescent T5HO	24	2 X-sect	800	17	13867
H14	Prudential Mini Olympic	Linear Pendant Direct	Flourescent T8	32	2 X-sect	832	20	16363
H15	Portfolio 4950	Adjustable Downlight	Metal Halide T6	70	1	924	85	78540
H16	Color Kinetics iColor Cove MX	Ingrade LED Coves	1'/unit RGB LED	12	1	720	12	8640
Total Watts								117409
Total Area								275300
Overall LPD								0.43

H13



H14



H15

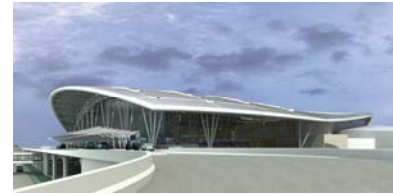


H16



For Ballast and Lamp Schedule, please see Appendix A.

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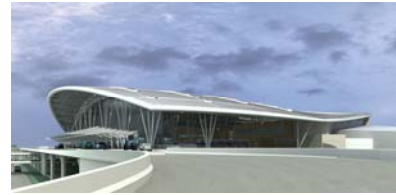
Light Loss Factor

Concourse								
Fixture #	Maintenance Category	Dirt Condition	Cleaning Interval	Ballast Factor	RSDD	LLD	LDD	Total LLF
H13	IV	Very Clean	6 Months	1	0.9	0.8	0.88	0.63
H14	IV	Very Clean	6 Months	0.98	0.9	0.8	0.88	0.62
H15	IV	Very Clean	6 Months	0.8	0.9	0.8	0.88	0.51
H16	VI	Very Clean	6 Months	1	0.9	0.8	0.82	0.59

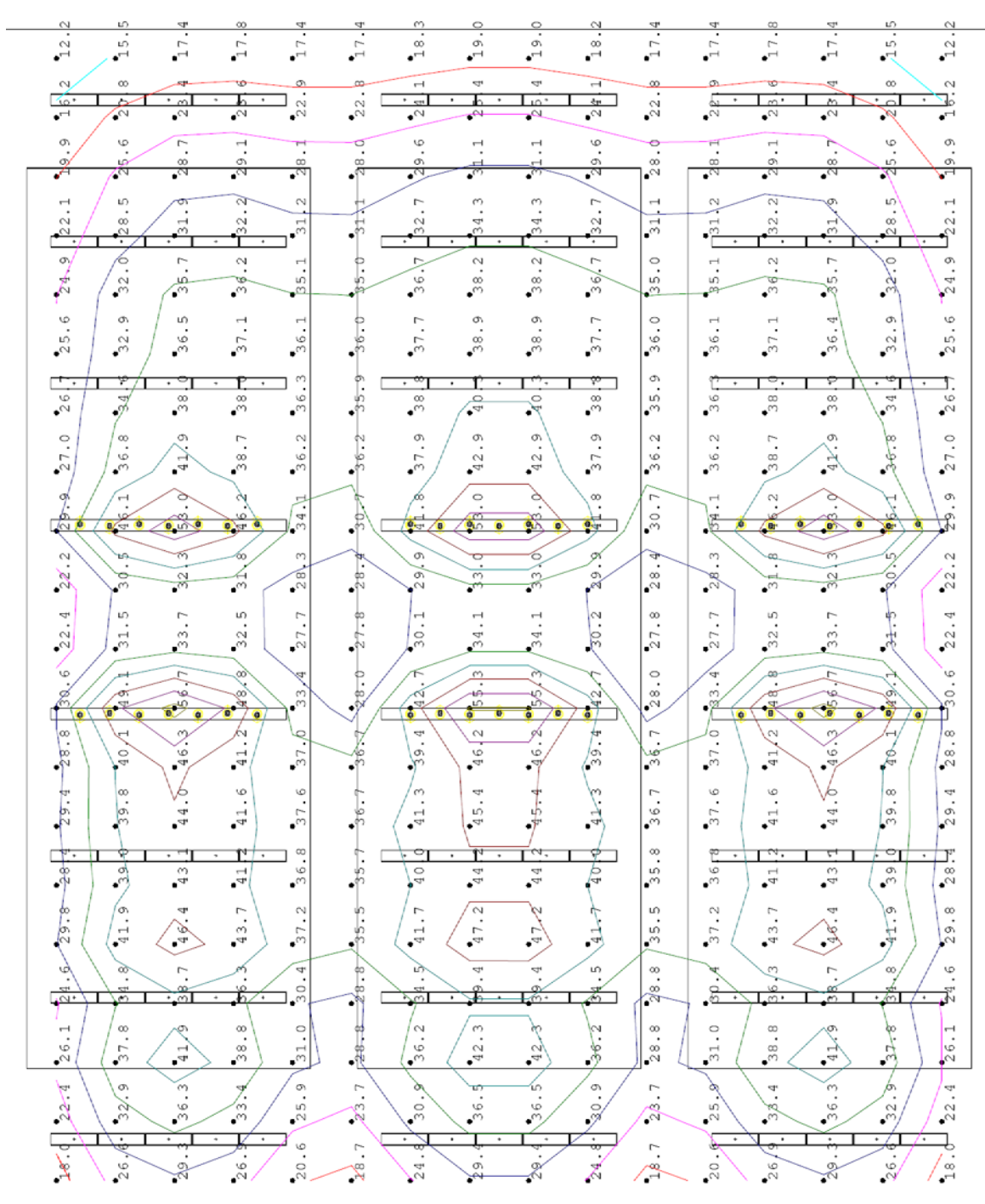
Lighting Power Density

Lighting Power Density (watts/sq.ft)	Area (sq.ft)	Obtained LPD (watts/sq.ft)	Illuminance Category	Recommended Illuminance Level (fc)	Obtained Illuminance (fc)	
Concourse						
Airport Concourse	0.62 W/sq.ft	275300	0.43	C	10	34.05
Reception/Waiting	0.54 W/sq.ft	91767	0.33	A	30	34.05

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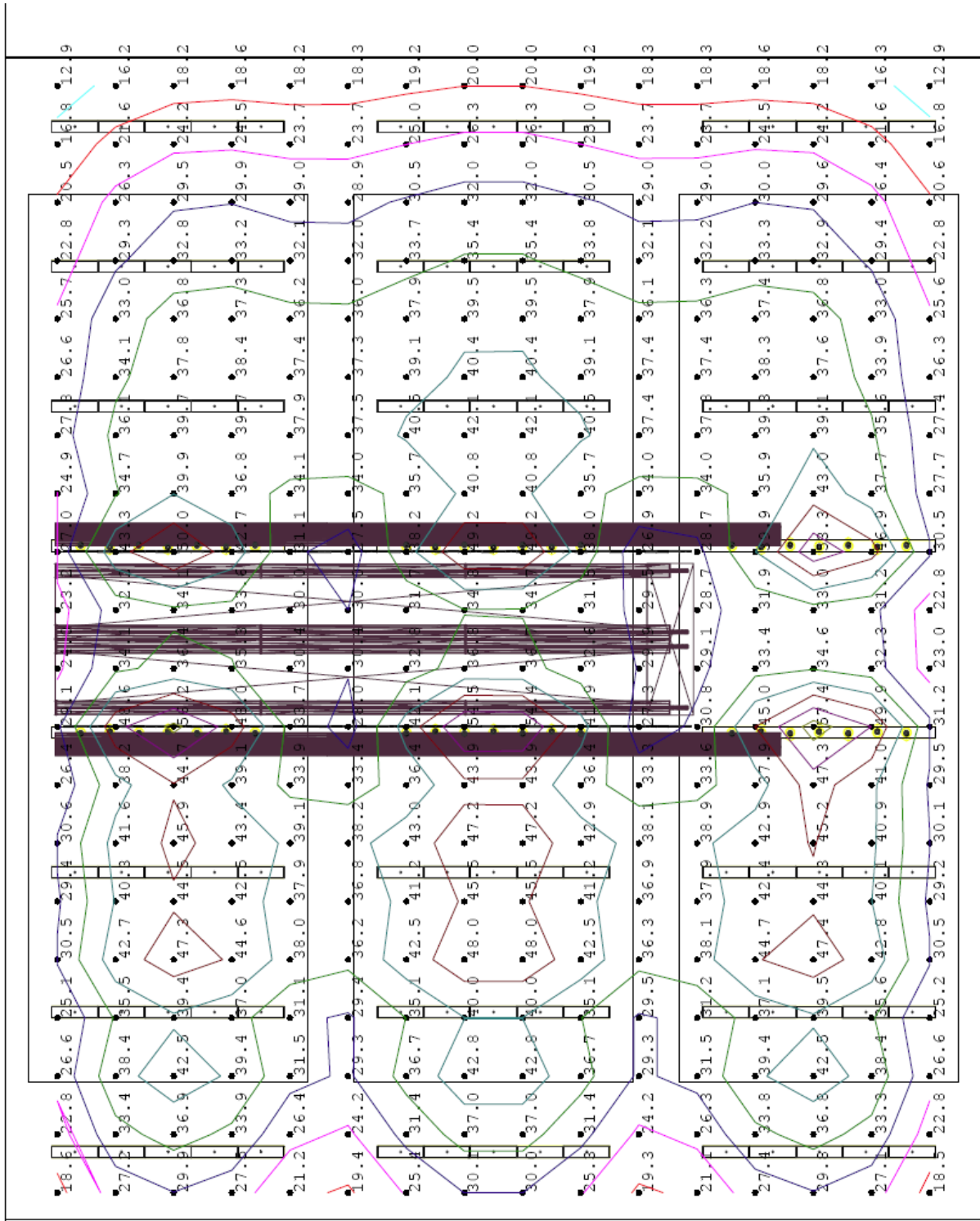
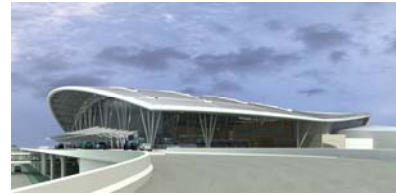


Illuminance Value



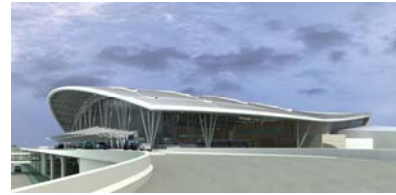
Concourse Light Distribution prior to the installation of Artificial Tunnel

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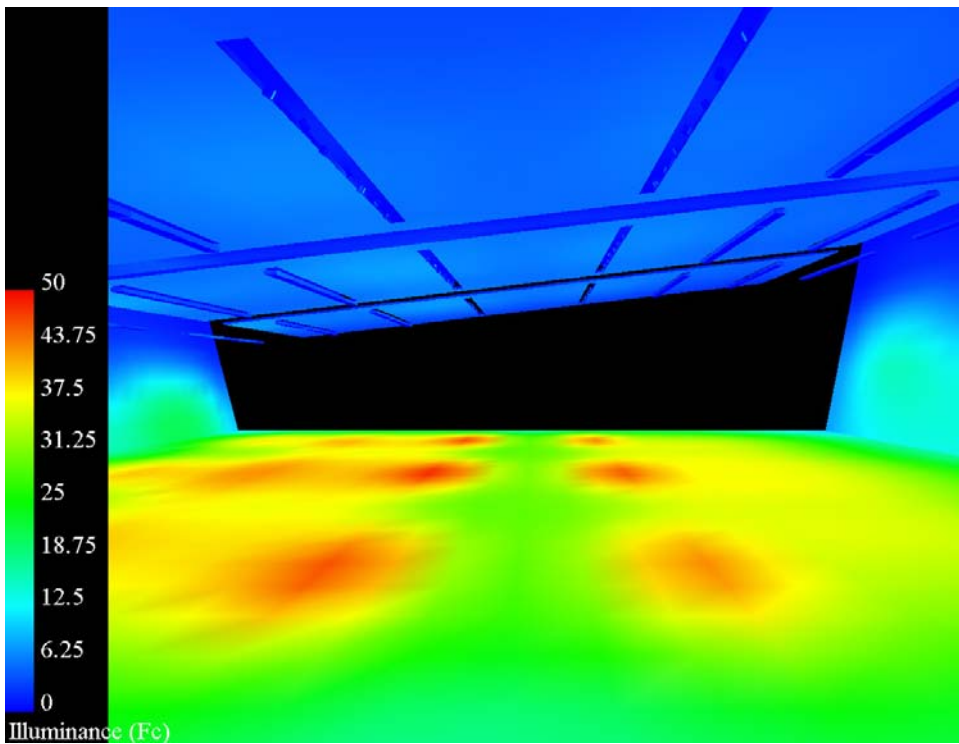
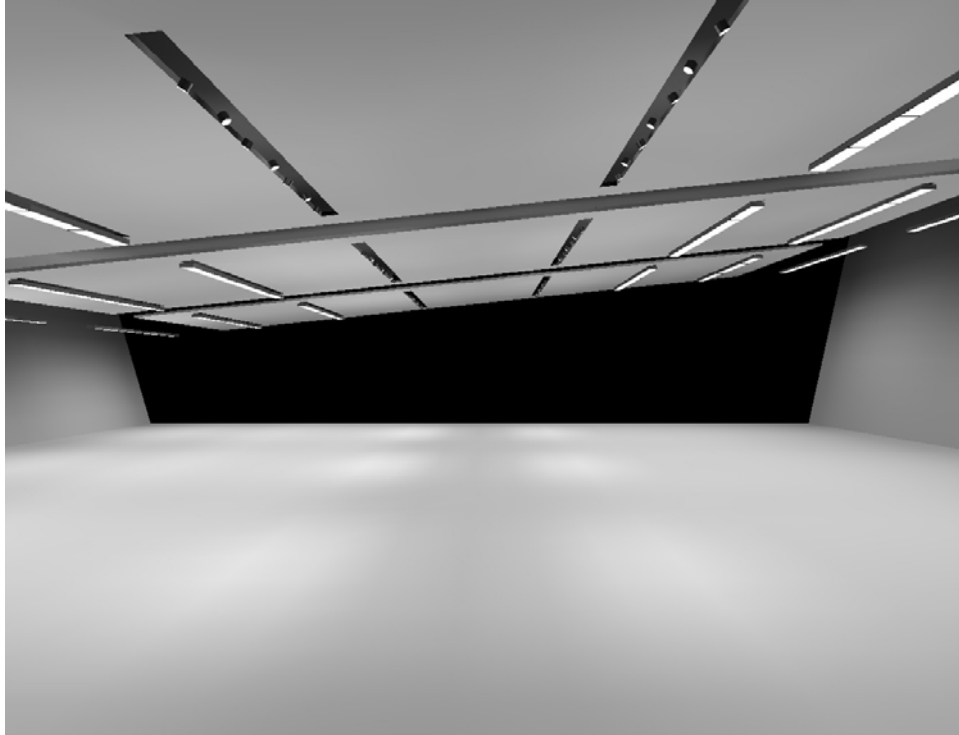


Concourse Lighting Distribution with artificial lighting installed

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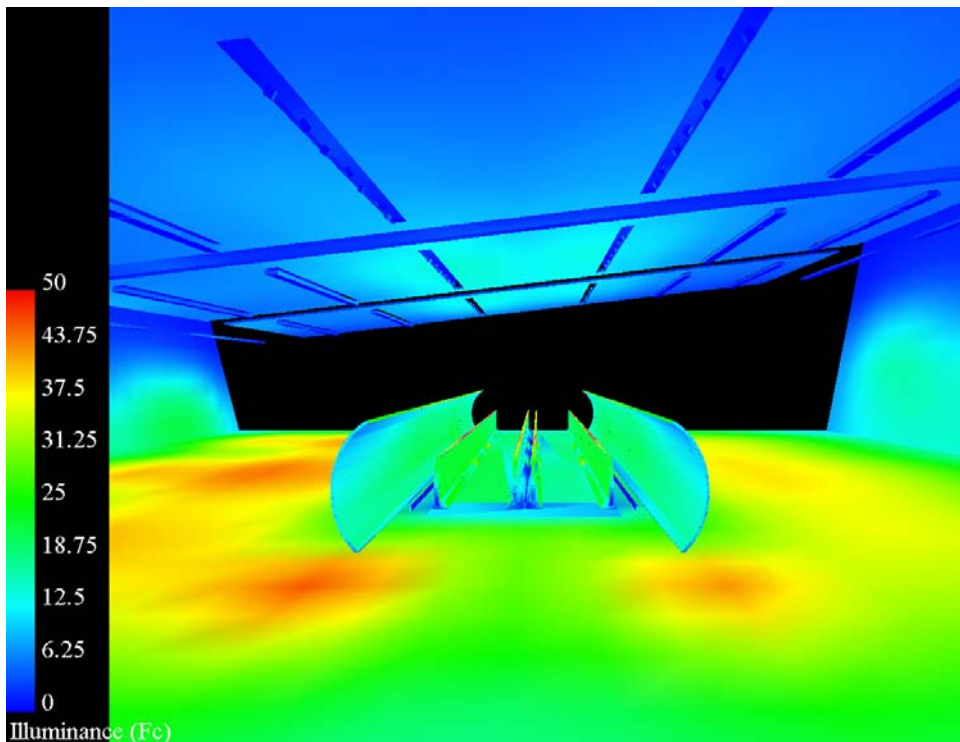
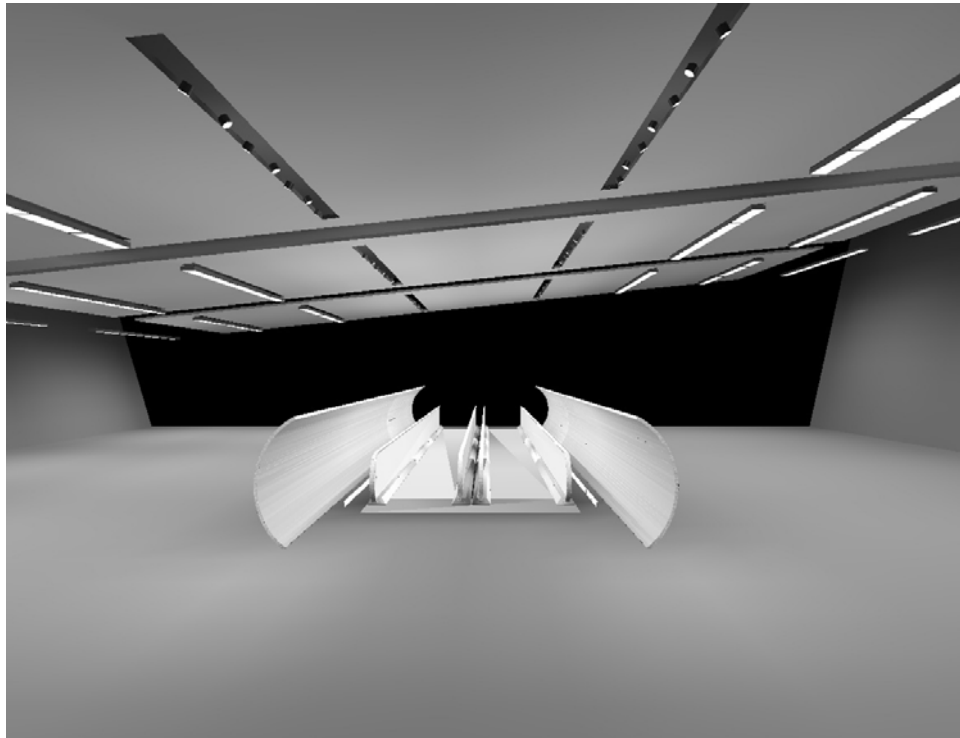
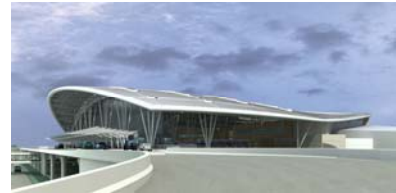


Rendering



AGI renderings prior to installation of Artificial Tunnel.

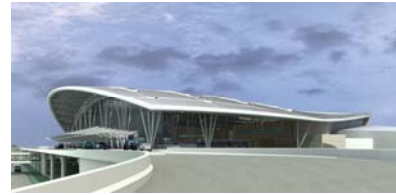
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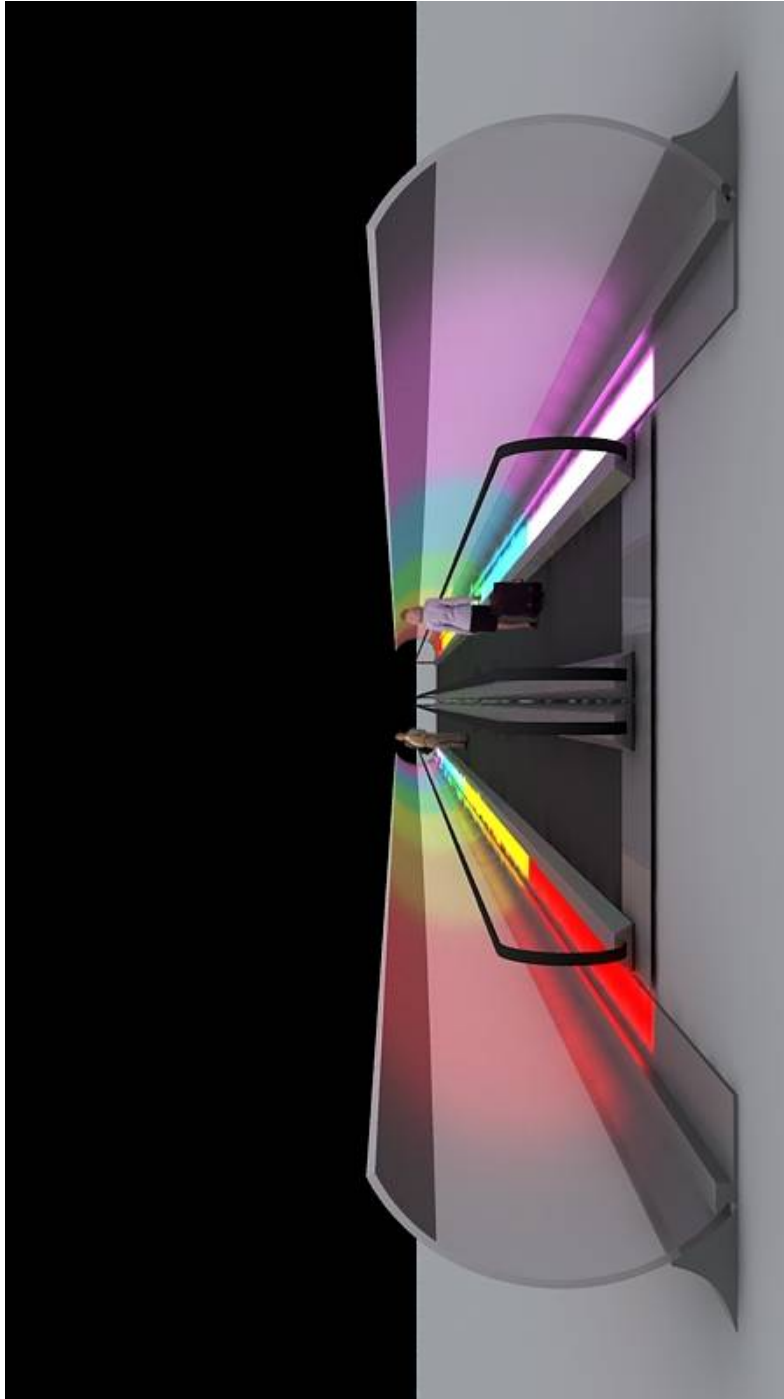
Illuminance (Fc)

AGI renderings with artificial tunnel & LED uplights installed

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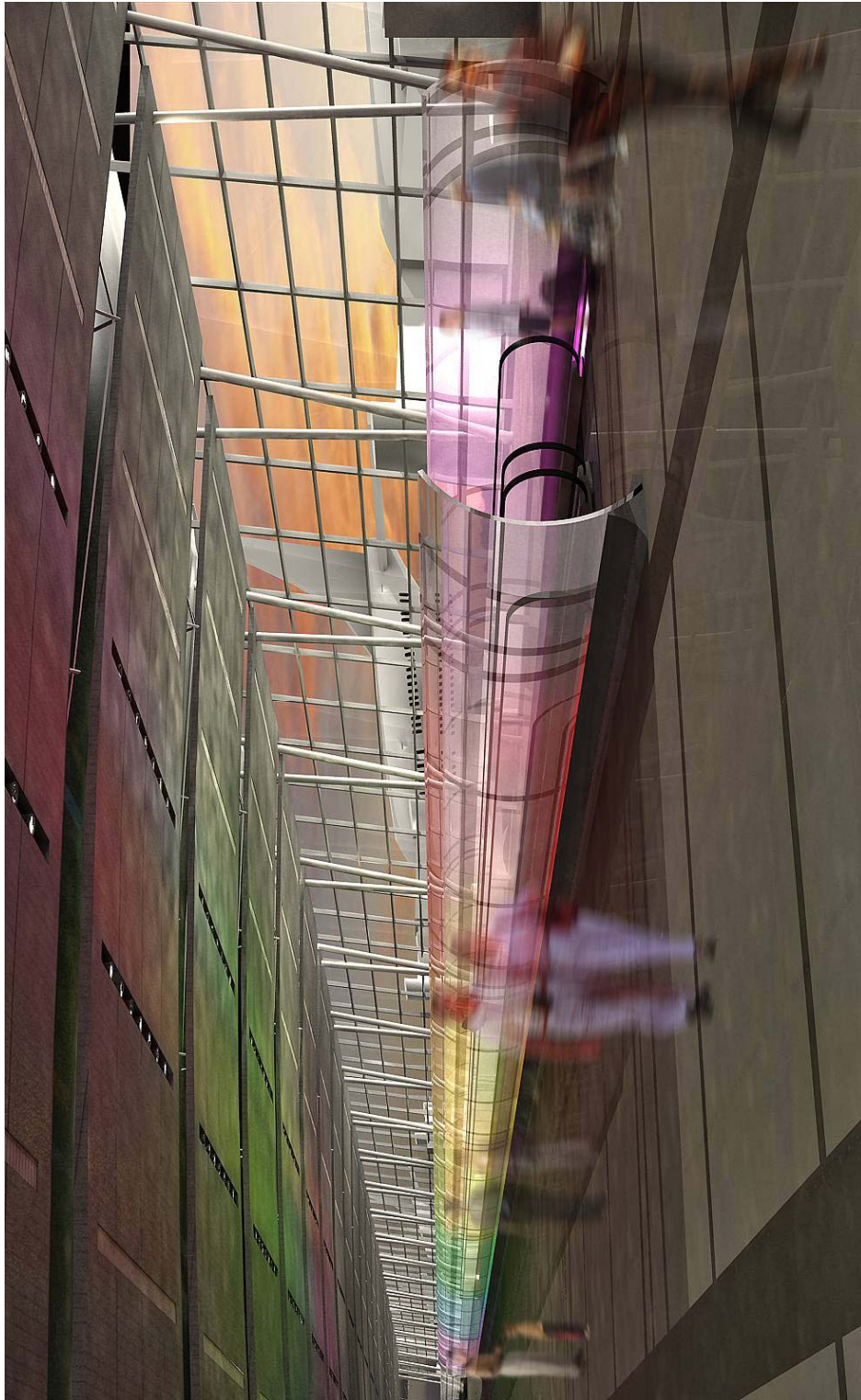
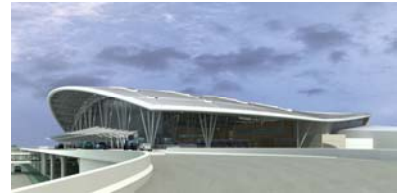


Concourse Rendering



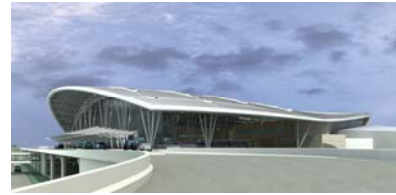
Tunnel Perspective Rendering

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Concourse with Tunnel Rendering

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Conclusion

The in-grade LED uplights not only provides visual interest to the artificial tunnel, it also help continues the guidance light concept from the previous spaces. The design language has been spoken consistently throughout all the spaces and is indeed very effective. Operable blinds are installed to ensure passenger's comfort. Mission completed.

