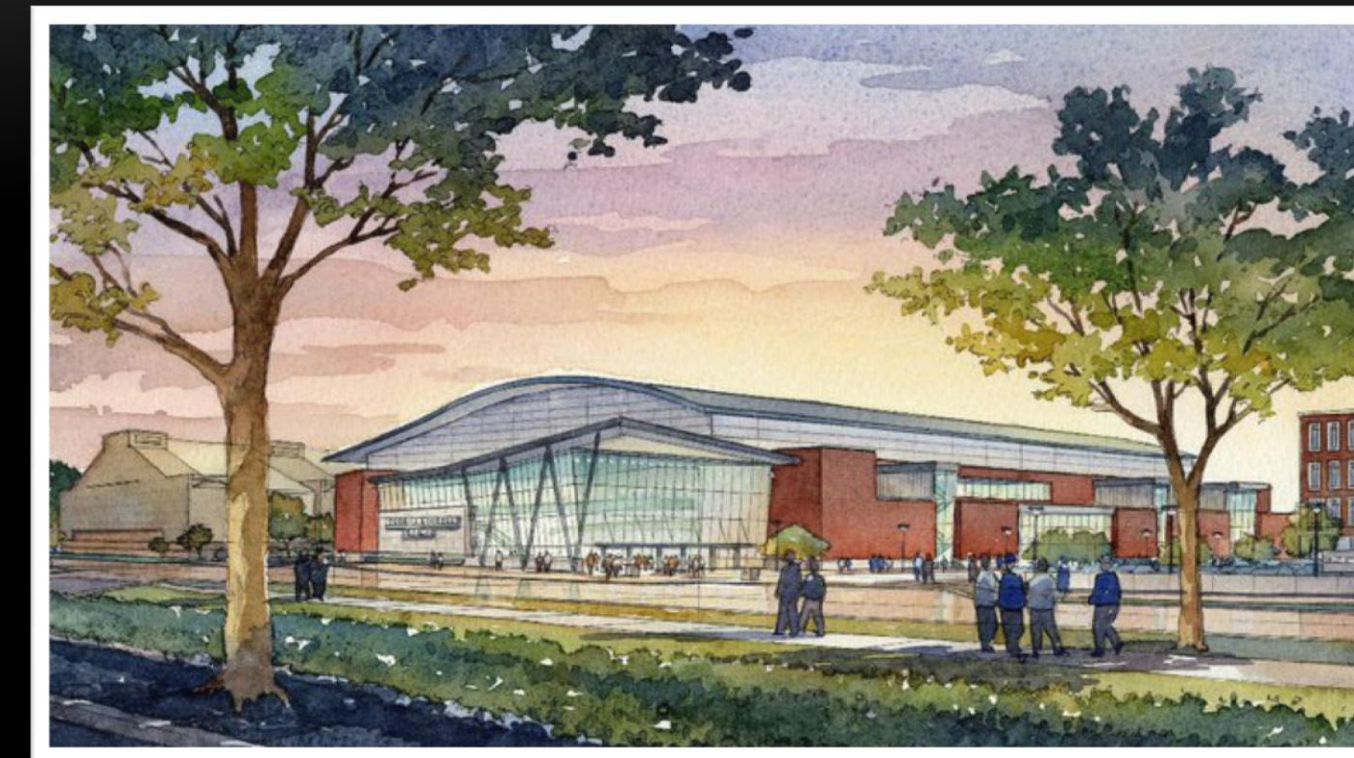




Ice Arena Research And Study Phase



Lights Out Design

Nate Babyak

Alex Ho

Brian Sampson

Alex Schreffler

SC Zoning/PSU Master Plan

Zoning:

50' setback along University Drive

Masterplan

Sub-district 9

Max FAR = 0.17

Max % Impervious = 50%

Max Building Height = 90'

Try to preserve existing vegetation (trees)

All exterior mechanical and electrical equipment must be screened (blocked from view).

Use finishes that are easy to maintain, light colors.



IBC 2009

Assembly Group "A"

Arenas

Skating rinks

Swimming pools

Ventilation

The minimum openable area to the outdoors shall be 4% of the floor area being ventilated.

Lighting

The minimum net glazed area shall not be <8% of room floor area

ADA 2009

Wheelchair Spaces Required:

CAPACITY OF SEATING IN ASSEMBLY AREAS	MINIMUM REQUIRED NUMBER OF WHEELCHAIR SPACES
4 to 25	1
26 to 50	2
51 to 100	4
101 to 300	5
301 to 500	6
501 to 5,000	6, plus 1 for each 150, or fraction thereof, between 501 through 5,000
5,001 and over	36 plus 1 for each 200, or fraction thereof, over 5,000

Wheelchair Passage Width

Minimum clear width at least 36 inches continuously

Site Arrival Points

Accessible routes must be provided from public transportation stops, accessible parking to building entrance

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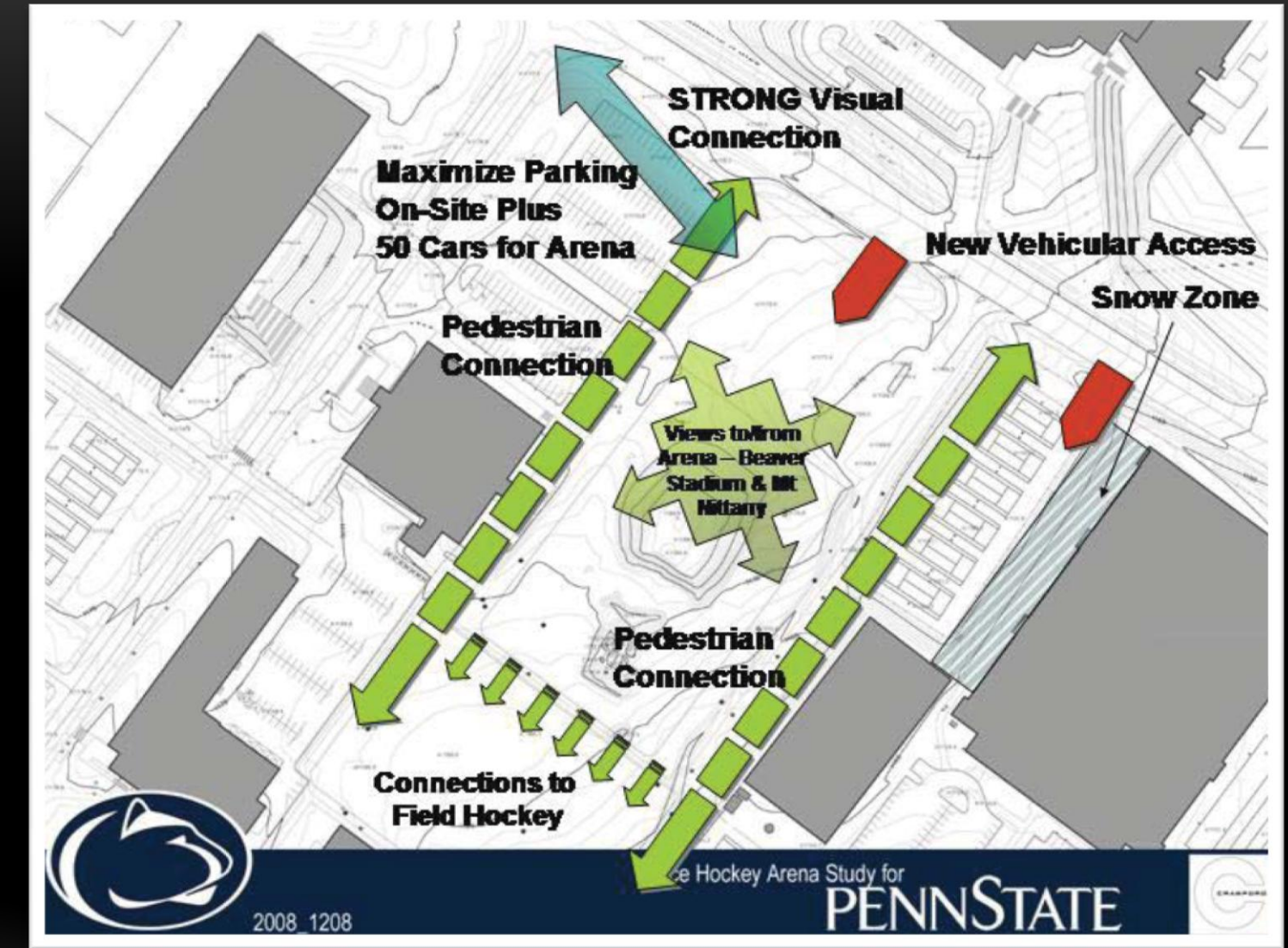
Brian Sampson

Alex Schreffler

Ice Arena Feasibility Study

Key Design Principles:

- Strong Visual Connection
- Cues from Context
- Maintain Tennis Building during Construction
- Mount Nittany Views
- Prominent Brand
- Meet LEED Standards



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Alex Ho

Brian Sampson

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Structural Considerations

Aesthetic of Material
Constructability
Lateral Stability
Roof Loading
Snow
Rigging
Catwalk
Ponding



Monolithic Dome



Space Frame Roof



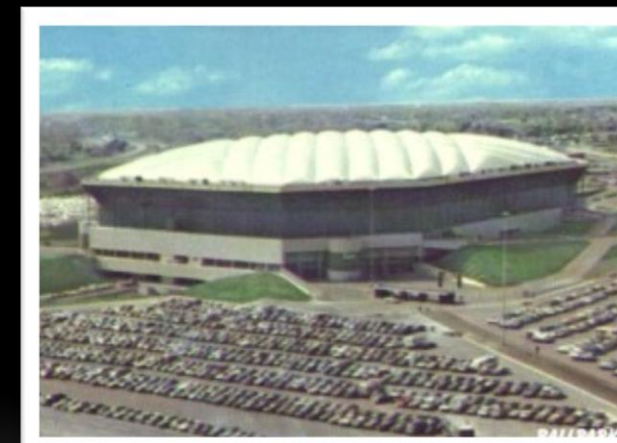
Cable Supported Roof



Three Hinged Arch



Flat Steel Truss



Air-Supported Roof



Wood Truss Roof



Thin Shelled Concrete

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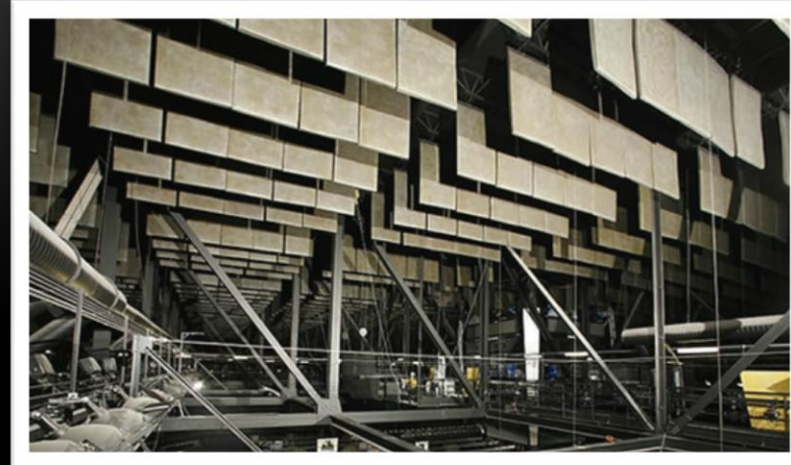
Ice Kube Systems - Geothermal



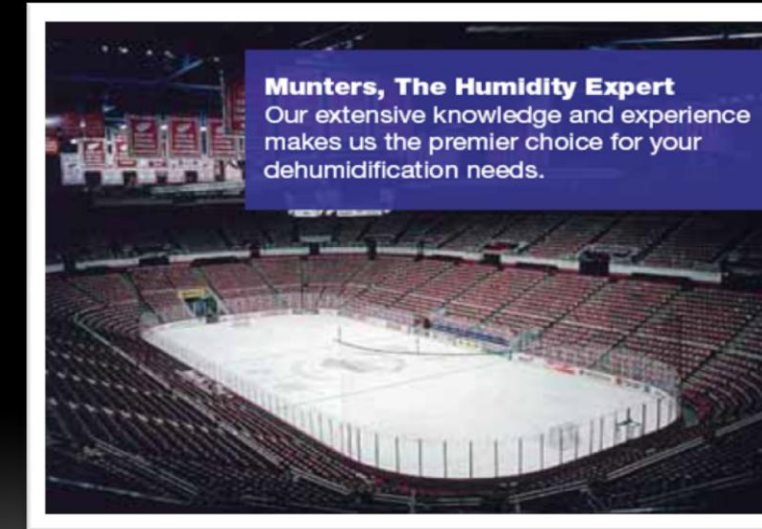
Ice Kube Heat



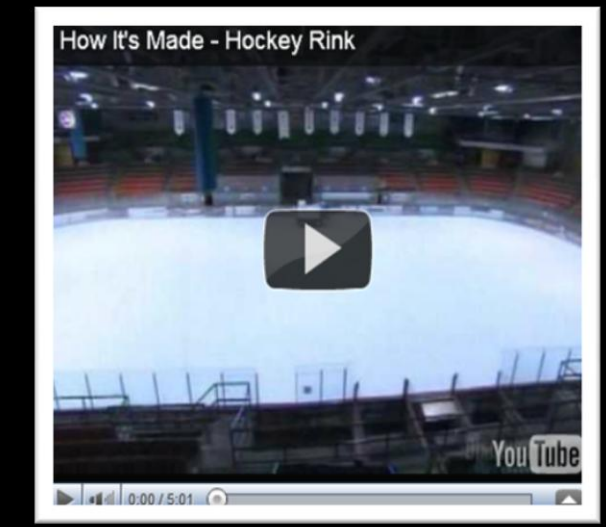
Target Center Acoustic Upgrade



Munters' Dehumidification



Event Deck

How Ice Hockey Rinks Are Made

IIHF

Lights Out Design

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Energy Requirements

Energy needs range from:

800,000kWh/year – 2,400,000kWh/year

Lighting accounts for 10% - 15% of energy consumption

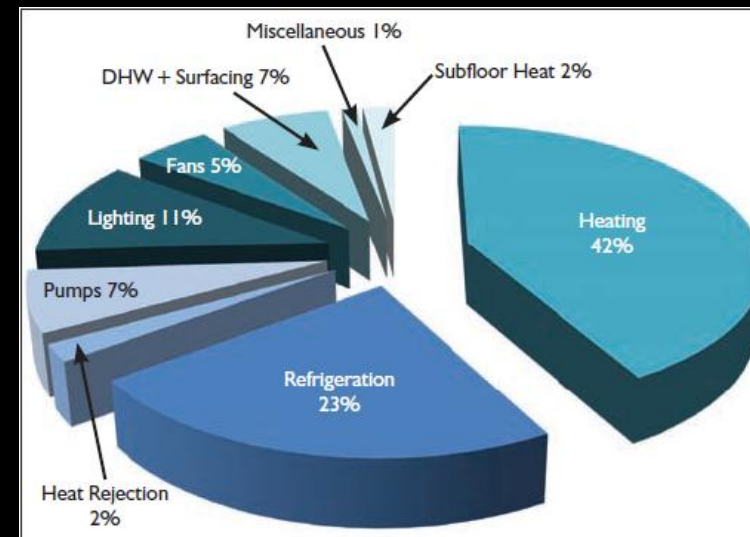


Figure 1: Inefficient arena (1,950,000 kWh).

Spaces & Considerations

Main Ice Rink

Restrike times

Glare (players and spectators)

Uniformity gradient on playing surface

Reduce shadows on playing surface

Practice Rink

Suite/Skybox

Circulation Spaces

Back of House

Offices, MEP

Theatrical/Advertising/TV Broadcasting Lighting

Tools

Rink Lighting

Metal Halide (most common)

Radiation component

Custom Fixtures

Generally more energy efficient

Hubbell – Para 2

Arcticlite (Fluorescent Fixture)

Can achieve up to 60% energy reduction versus use of metal halides

Better uniformity levels

Reduces refrigeration loads



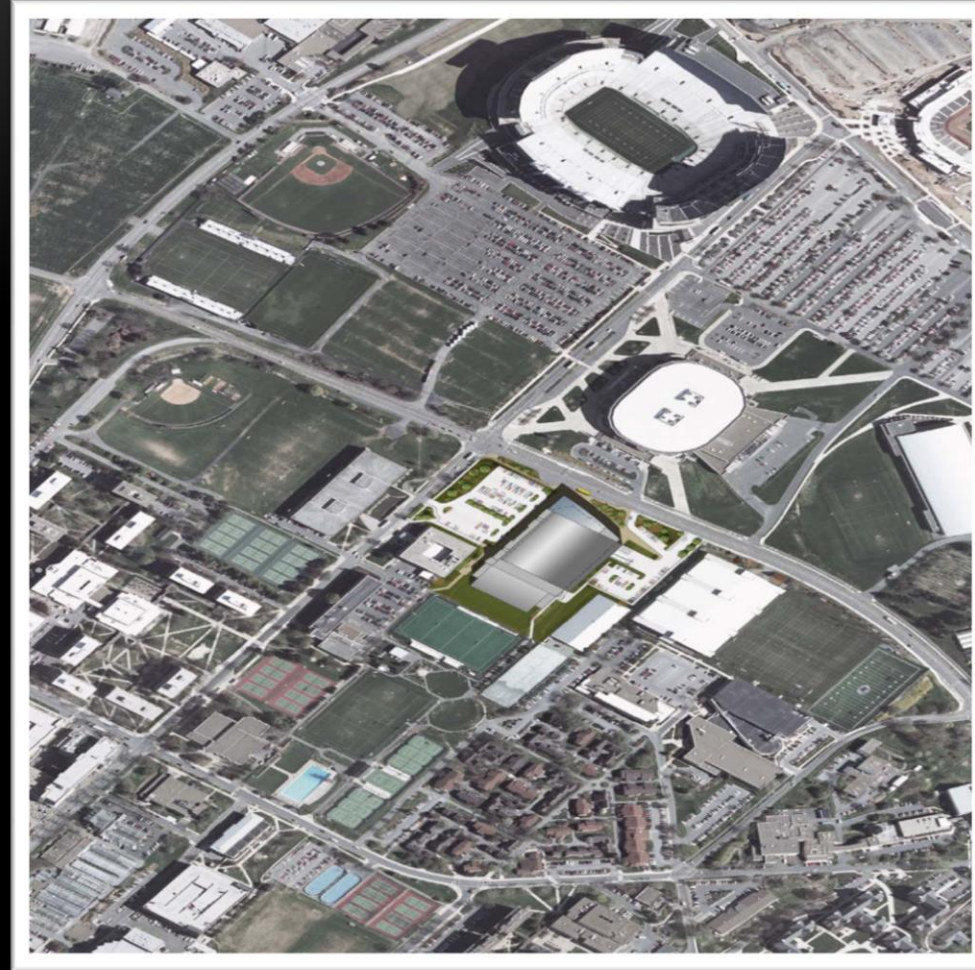
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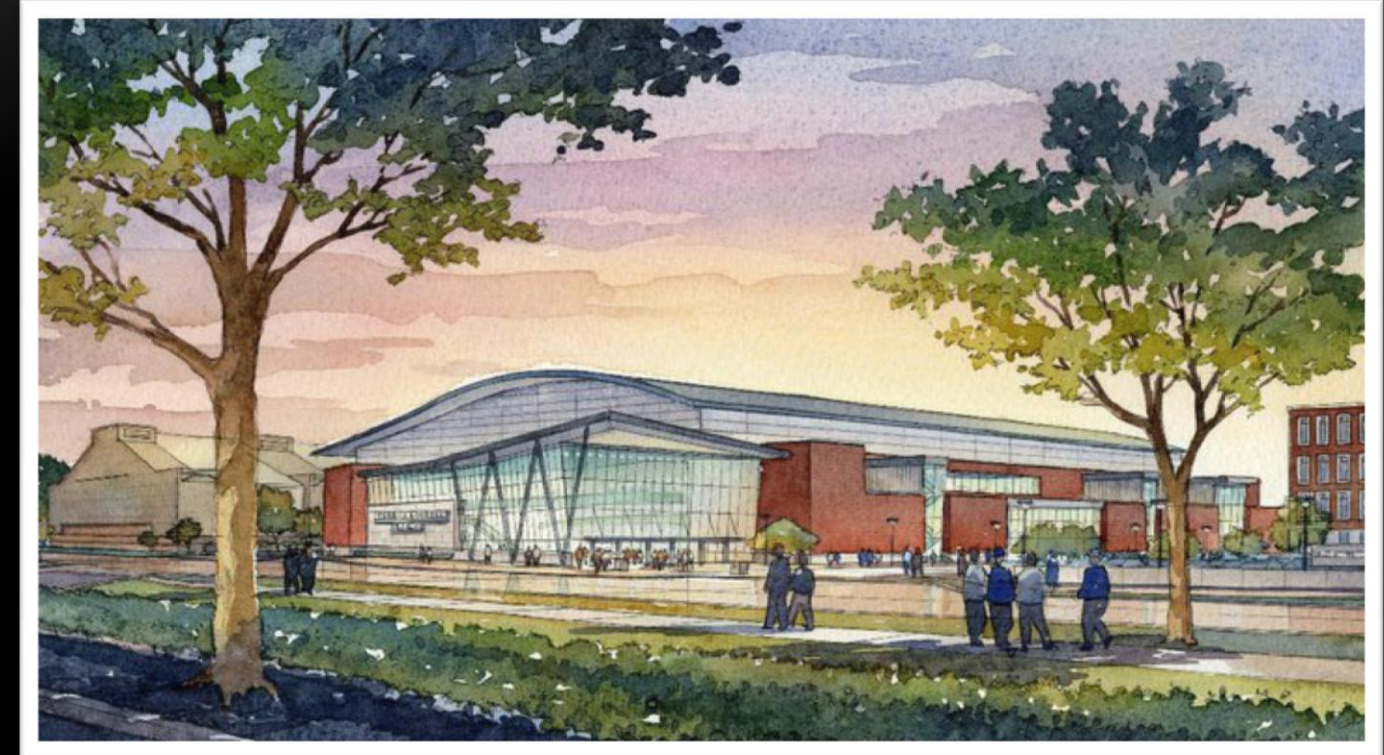
Alex Ho

Brian Sampson

Alex Schreffler



Questions/Discussion



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Nate Babyak

Alex Ho

Brian Sampson

Alex Schreffler