



ASHRAE CHAPTER TECHNOLOGY AWARD

Illinois Chapter, Region VI

CHAPTER/REGIONAL TECHNOLOGY AWARD - SHORT FORM

1. Category (Check one and indicate New or Existing, if applicable)

- | | |
|---|--|
| <input type="radio"/> Commercial Buildings | <input type="radio"/> New or <input type="radio"/> Existing |
| Institutional Buildings: | |
| <input type="radio"/> Educational Facilities | <input type="radio"/> New or <input type="radio"/> Existing |
| <input checked="" type="radio"/> Other Institutional | <input checked="" type="radio"/> New or <input type="radio"/> Existing |
| <input type="radio"/> Health Care Facilities | <input type="radio"/> New or <input type="radio"/> Existing |
| <input type="radio"/> Industrial Facilities or Processes | <input type="radio"/> New or <input type="radio"/> Existing |
| <input type="radio"/> Public Assembly | <input checked="" type="radio"/> New or <input type="radio"/> Existing |
| <input type="radio"/> Residential (Single and Multi-Family) | |

2. Name of building or project: Chinatown Branch Chicago Public Library
City/State: Chicago, IL

3. Project Description: New, 16,000 sq. ft., state-of-the-art public library
Project Study/Design Period: 09/2013 to 10/2014
Begin date (mm/yyyy) End date (mm/yyyy)
Percent Occupancy at time of submission: 100%

4. Entrant (ASHRAE member with significant role in project):

a. Name: Anand Sachin
Last First Middle
Membership Number: 5184161
Chapter: Illinois
Region: VI
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Chicago IL 60654 U.S.
City State Zip Country
c. Telephone: (O) (312) 915-0557 d. Email: sanand@dbhms.com
e. Member's Role in Project: Design Engineer
f. Member's Signature: 

5. Engineer of Record: dbhMS

By affixing my signature above, I certify that the information contained in this application is accurate to the best of my knowledge. In addition, I certify that I have discussed this entry with the owner and have received permission from the owner to submit this project to the ASHRAE Technology Awards Competition.

Located on a prominent site in the Chinatown neighborhood of Chicago, the new 16,000 sq. ft. Chinatown Branch Library aims to create a new civic, educational and social hub for the surrounding community, providing a place of discovery and learning in the new digital age. The state-of-the-art library offers a unique blend of traditional library services and the cutting edge technology featured in 21st century libraries, as well as striking modern architecture and community specific design features. The library has a large central space for community gathering and a large, a glass-enclosed community room for events and programs and two meeting rooms for small group work. It features a large reading room, a YOUmedia digital media space for teens, an expanded community room, children's reading room, meeting space for community use, state of the art technology, Wi-Fi, and self-checkout stations.

The planning process for the library included strong participation from the community, and included visioning sessions with the Chinatown community and key stakeholders to create design goals and a spatial program concept. dbHMS' integrated design approach leveraged waste heat from a small on-site generator that further reduced energy consumption through a radiant tempering system. These systems are all proven, "state-of-the-art" technologies, yet needed to be tuned to work in harmony with one another to create an incredible environment that maintains the high standards set by the architectural design and are required by the Public Building Commission of Chicago, which developed the project on behalf of its client, Chicago Public Library. The library is designed to achieve LEED Gold Certification.

Energy Efficiency

The building systems are designed to be energy efficient, reducing overall consumption by 44.1% over a baseline system (ASHRAE 90.1-2007). The building expects to achieve 17 LEED points for optimizing energy performance (EAc1 LEED Version 3). Table 1 provides the predicted building energy performance.

Table 1: Predicted Energy Performance Relative to ASHRAE 90.1-2007 Baseline		
	Energy Model	Baseline
Electricity Consumption	100,499 kWh	196,661 kWh
Gas Consumption	2,669 therms	2,967 therms
Total Consumption	610 MMBtu	968 MMBtu

The design consists of the following systems:

The library includes a radiant heating and cooling system throughout all public areas of the building. The radiant system consists of suspended polypropylene radiant mats that are coordinated to provide an aesthetic effect throughout the building. Each mat has the capability for both direct radiant and convective conditioning. Small circulation fans are available to augment convective effect if needed. The building is zoned to optimize thermal comfort and operating efficiency. Coupled with the radiant system, a dedicated

outside air unit that provides ventilation air into the building. The system has energy recovery capabilities through an energy recovery core integral to the unit.

The library includes both chilled and hot water systems serving all radiant and air handling equipment. A magnetic bearing air-cooled chiller with an integral economizer and condensing boilers are provided to serve these systems. Additionally, to optimize operating efficiency an array of gas absorption heat pumps provides either chilled or hot water under partial loads.

Indoor Air Quality

The open environment of the library provides effective opportunity for demand control ventilation. CO2 sensors are located within the space monitoring air quality and modulate outdoor air as required.

Innovation

The library’s open environment provides a highly effective climate for radiant space conditioning. This is ideal for allowing uniformity in thermal comfort throughout the entire space, without warm and cold spots synonymous with all-air systems.

Operation & Maintenance

The library is open year round with a large number of visitors from local schools as well as community residents. The occupancy of the building varies by day and even by hour, which makes demand control ventilation essential for maintaining air quality as well as reducing energy use.

Cost Effectiveness

Chinatown Branch Library is a prime example of effective planning and cost effective design. The systems of the building are fine-tuned for the application, allowing more capital for finishes and program space. Examples of cost-effective design strategies include polypropylene hydronic piping and radiant mats, reduced ductwork for ventilation only, and ECM pumps.

Environmental Impact

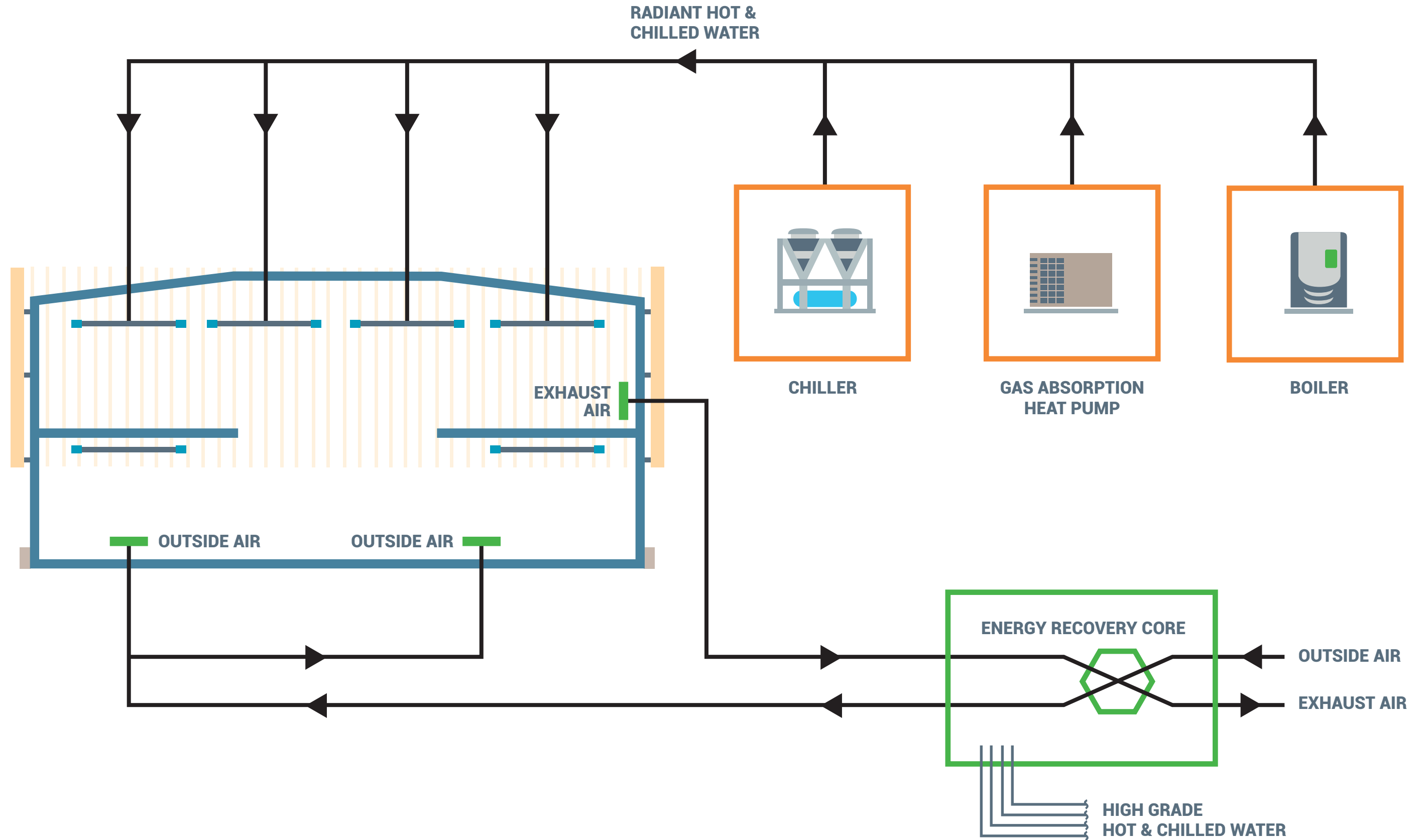
Table 2 summarizes the predicted environmental impact of the building relative to the ASHRAE 90.1-2007 Appendix G Baseline:

Table 2: CO2 Reduction from ASHRAE 90.1-2007 Baseline			
	Energy Model	Baseline	Reduction
LBs CO2 Emitted*	189,473	337,562	148,090
Estimated Building Energy Intensity (kBtu/sf)	37.3	59.1	21.8

*1.54 lbs CO2/ kWh and 116.97 lbs CO2/MMBtu- EPA 2009

CHINATOWN BRANCH LIBRARY

SYSTEMS DIAGRAM



OWNER'S RELEASE

ASHRAE Chapter/Regional Technology Awards 2015

I, Molly Sullivan, certify that I am a representative of Chinatown Branch Chicago Public Library, 2100 South Wentworth Avenue, and grant permission to dbHMS, 303 W Erie. St., Chicago, IL, to enter the project for the ASHRAE Technology Awards competition 2015.


Signature: _____

Date: 6 October 2015