United States Environmental Protection Agency

land revitalization

Region 5 Land Revitalization Technical Assistance Project

GREEN BUILDING AND HISTORIC PRESERVATION CASE STUDIES FOR MOLINE MULTI-MODAL STATION PROJECT (2 OF 5)

EPA provided technical assistance support to the City of Moline, Illinois in the areas of green building and historic preservation for the Moline Multi-Modal Station Project. This assistance was intended to strengthen the HUD-DOT-EPA Partnership for Sustainable Communities by providing the City of Moline access to technical resources and expertise. EPA's technical assistance activities focused on the development of five case studies on the renovation of existing/historic structures to meet Leadership in Energy and Environmental Design (LEED) standards for multi-modal transportation projects, where possible. These five case studies were presented at the Moline Developer Workshop held on October 18, 2011. This is the second case study in the series.

UNION DEPOT MULTI-MODAL TRANSIT AND TRANSPORTATION HUB – ST. PAUL, MINNESOTA

Project Summary

The Saint Paul Union Depot Multi-Modal Transit and Transportation Hub is a passenger rail and regional transit project. It consists of the renovation of historic Union Depot and the co-location of Amtrak, intercity bus carriers, local bus and light rail services, taxis, limousines and bicycle accommodations. The Depot will provide future capacity for high-speed rail and other planned intercity and light rail services.

The project is located in an urban downtown setting and is expected to have a significant positive impact on downtown revitalization.

Historic Features

Union Depot is individually listed on the National Register of Historic Places. It is the pivotal property in the Lowertown National Historic Register District and the St. Paul Lowertown Heritage Preservation District and serves as an integral part of the surrounding urban fabric.

The project will return the Depot's trio of historic buildings (the waiting room, concourse and head house), as well as its elevated rail yard, to active use. A Programmatic Agreement was developed with the State Historic Preservation Office and other agencies that identifies areas of historic preservation and other design requirements—including a 300 square foot area in the last remaining original stairwell that will become an interpretive center.

Rendering of the Union Depot entrance *(Source: RCRRA)*

Project Description

Elements: Transit, Historic, Green

Size of Community Served:
St. Paul population = 287,151

Current Owner: Ramsey County Regional Railroad Authority

Square Footage: 185,000 Square Feet & 33 acres

Original Construction Date: 1924

Historic Designation: National Register of Historic Places (1973)

Project Completion Date: 2012

Construction and Project Costs:

Construction Cost: $148 Million

Total Project Cost: $243 Million

LEED or Other Green Certification: Targeted LEED 2009 NC Silver - expected to achieve Gold

Green Features

Green features include:

- Asbestos abatement
- Construction waste management
- Full-service bicycle station
- Electric vehicle charging stations
- Fuel-efficient vehicle parking
- Connection to district heating/cooling
- Bike/pedestrian enhancements
- Public transportation access
- Stormwater control
- Building reuse
- Construction waste management
- Water efficient landscaping

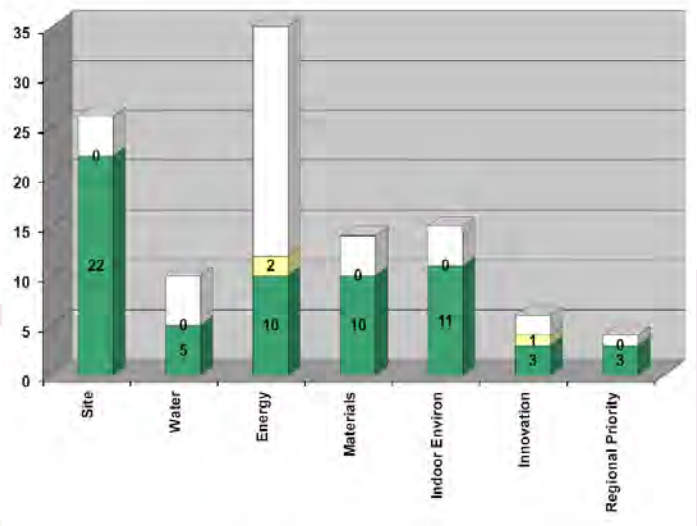
Challenges and Solutions

Building Entrance

A new entrance to the historic train deck provides an important component of modern functionality. The design was modified from a completely glass enclosure to one incorporating more use of stone and brick, which was deemed more complementary to the historic building.

Head House Historic Access and Light Rail Station Development

The new Central Corridor light rail station impacted the main building entrance and effectively eliminated automobile access to the ceremonial front door. This impacted the historical access to the building. The design team reviewed the historical plans and worked with local historical agencies to develop an alternate access point via an existing carriageway entry at the lower level. Widening the carriageway, in the same architectural style and materials as the original, provides access to the historic Head House in the same general location and separates event access from transportation access. The plaza was rebuilt and insulated and energy efficient lighting was installed.



Union Depot LEED Credit Summary
(Source: HGA Architects and Engineers)

Historic Windows and Energy Efficiency

The building has many of the original windows in place, some with steel frames and some with wood. Much discussion revolved around how to retain these windows and improve energy efficiency. All of the steel frame windows were refurbished and supplemented by a storm window for energy efficiency. In addition, the Waiting Room has three large skylights that were painted over during the war years. The skylights have been cleaned and restored to allow daylighting into the Waiting Room that has been absent for nearly 70 years.

Building Material Salvaging and Reuse

Many building materials in an historic building are no longer available and often difficult to match effectively. This challenge was addressed in the following ways:

- The Union Depot has been able to utilize many aspects of its existing fabric in the new construction; terrazzo removed in one area was salvaged and reused in areas where it was missing;
- Historic doors were repaired, refurbished, refinished and reinstalled;
- Existing stone wainscot was cleaned, patched and reused;
- Brick removed from one area was reinstalled in other areas;
- The only remaining historic train access stair and platform was relocated to provide for its immediate use as an historic exhibit and future use for transportation;
- Historic accessories such as wood cabinetry, signage, and clocks are all being reused and in some cases, reinterpreted; and
- Original mechanical chases are once again being used for the new building systems.

Agencies Involved in the Section 106 Process

State Historic Preservation Office

St. Paul Heritage Preservation Commission

St. Paul Planning and Economic Development

Minnesota Department of Transportation

Historic St. Paul

Preservation Alliance of Minnesota

Mississippi National River and Recreation Area

National Park Service

Capitol River Council

Accelerated Schedule and Agency Review

The accelerated schedule was in potential conflict with a deliberate Section 106 historic preservation review process that requires thorough documentation and a 30 day review process at each step. This process was managed by involving key agencies that met on a regular basis (every three weeks) to discuss and present design options. The design team included representatives from the owner, contractor, architects, and transportation planners. Meetings were facilitated by the team's historical architects. The process allowed the architects time to adequately develop design approaches—based on initial positive feedback, without requiring significant, last minute redesign work—resulting in better detailed design solutions. This collaborative process was efficient and rewarding. Differences could be discussed and weighed in the overall context of all participants who had the opportunity to help shape and influence the outcome.

Partnerships and Funding Strategies

Ramsey County Regional Railroad Authority (RCRRA) is an affiliate of Ramsey County. RCRRA will build, own, and manage the completed facility. The other involved parties are:

- Transportation providers including Amtrak, intercity bus carriers, Metro Transit and the Twin Cities regional transit agency.
- Funding partners include the Minnesota Department of Transportation for Federal Railroad Administration and Federal Highway Administration funds and the Metropolitan Council for Federal Transit Administration funds.
- Organizations and government are serving in a variety of coordination and support roles such as LOCATE Task Force, City of Saint Paul, Saint Paul Area Chamber of Commerce, Counties Transit Improvement Board, AFL-CIO, On Board Midwest, Saint Paul Port Authority, BOMA – St. Paul, Saint Paul Riverfront Corporation, Capitol City Partnership, U.S. Postal Service, Minnesota High Speed Rail Commission, Red Rock Corridor Commission, Rush Line Task Force and the Gateway Corridor Commission.

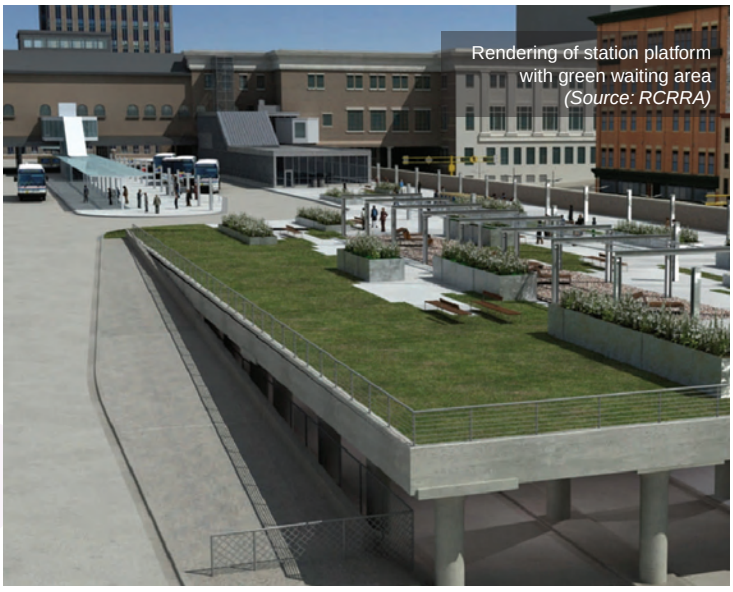
Project costs include purchase of the train deck, waiting room, concourse and adjacent land from the U.S. Postal Service and purchase of the Head House public area from a private owner. Track usage agreements will be required with two Class I railroads, Union Pacific and Canadian Pacific.

Funding sources to date include:

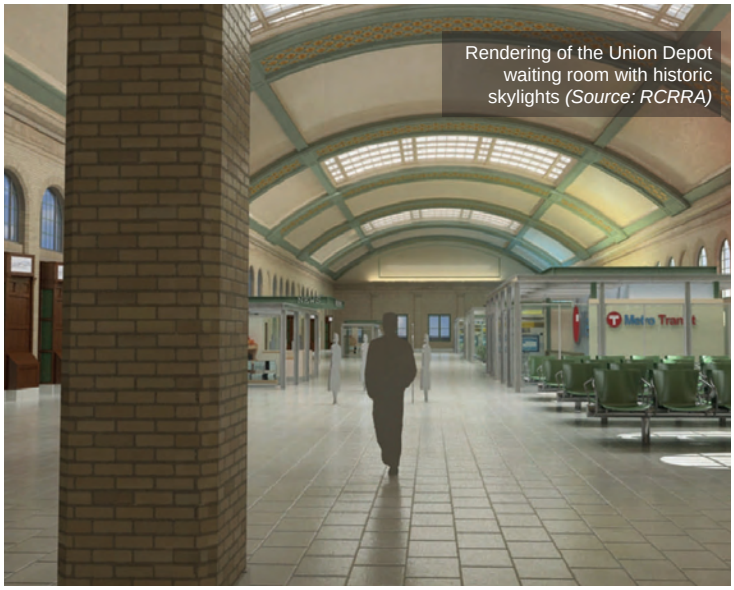
- SAFETEA-LU, 1301 federal funds $43.5 million
- Federal Railroad Administration funds, HSR $40 million
- TIGER 1 federal funds $35 million
- Federal Transit Administration funds $4 million
- State bond funds $13.7 million
- Expended RCRRA levy $51.5 million

Leverage Financing Opportunities

RCRRA will negotiate leases and/or operating agreements with the transportation providers for internal space needs and provide core and shell conditions for the provider to complete and furnish.



Rendering of station platform with green waiting area *(Source: RCRRA)*



Rendering of the Union Depot waiting room with historic skylights *(Source: RCRRA)*

The Head House was in private hands and the public area was purchased by RCRRA in order to secure ownership of the project area of 33 acres.

Costs Attributed to LEED

LEED costs are not being tracked separately. The increased energy efficiency will be a cost savings for RCRRA.

Project Effect on Neighborhood

The project plays a key role in the revitalization of downtown St. Paul, particularly the Lowertown district. Union Depot is listed on the National Register of Historic Places and is the pivotal building in national and local preservation districts. The city envisions eventual, area-wide development of a mixed-use, transit-oriented, walkable nature, stimulated in large part by the Union Depot and the Central Corridor investments. Development will include new infill construction as well as adaptive reuse of existing buildings.

Many of the Union Depot design aspects have taken into account the needs and concerns of the neighborhood. Regularly scheduled community and tenant meetings provided additional feedback on a timely basis and kept area residents and businesses informed as to intent and progress. Among these needs and concerns were better access to the Mississippi River, a park area, bicycle access, community focused retail, local artist opportunities, and connections to the rest of the area.

Sources for Additional Information

For more information on this restoration project, please see the RCRRA website: www.co.ramsey.mn.us/rail/UnionDepot.htm.

Project Contact

For more information on the Union Depot restoration, please contact:

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Project Team

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Beyer Blinder Belle
Historic Architects
(800) 777-7892
(212) 777-7800

Awards

Cultural Heritage Award for the Union Depot Historic Structures Report *(Awarded by Saint Paul Historic Preservation Commission & American Institute of Architects – St. Paul Chapter)*

2011 Minnesota Preservation Award for the Union Depot Historic Structures Report *(Awarded by the Preservation Alliance of Minnesota)*

LEED 2009

BD & C Certification Planning Matrix

LEED PREREQUISITES	8 req'd	met
LEED CERTIFIED	40-49	YES
LEED SILVER	50-59	YES
LEED GOLD	60-79	YES
LEED PLATINUM	80+	need 16

LEED 2009 Credit		Points	Point Status			Design or Constr Submittal	Compliance Requirements
			Likely	Needs Invstgtn	Not Likely		
SS	SUSTAINABLE SITES	26	22	0	4		
PR 1	Construction Activity Pollution Prevention	X	x			C	Erosion control plan per typical regulatory standards
1	Site Selection	1	1			D	Do not develop on farmland, flood plain, habitat, wetland or water, or park lands
2	Development Density & Community Connectivity	5	5			D	**Option 1 :** Meet 60,000sf/acre density for project and adjacent buildings. **Option 2 :** Identify residential area & 10 human services available within a 1/2 mile radius of project site.
3	Brownfield Redevelopment (Asbestos Abatement by alternate compliance)	1	1			D	Describe site contamination and remediation steps taken. (Testing and removal reports per recognized standards for asbestos abatement.)
4.1	Public Transportation Access	6	6			D	Show pedestrian travel distances of 1/2 mile to rail transit or 1/4 mile to 2 bus routes/stops.
4.2	Bicycle Storage and Showers	1	1			D	Provide secure bike storage for 5% of occupants and shower facilities for 0.5% of occupants.
4.3	Low Emitting & Fuel Efficient Vehicles	3	3			D	Support and encourage efficient vehicle use by providing vehicles, providing preferred parking for vehicles, or providing alternate fuel stations.
4.4	Parking Capacity	2	2			D	Limit parking to minimum local zoning requirements and provide preferred parking for carpools, or add no parking to the site.
5.1	Protect or Restore Habitat	1			1	C	Limit site disturbance on greenfield sites, or protect/restore 50% of site area on previously developed sites.
5.2	Maximize Open Space	1			1	D	Provide vegetative open space for 20%-25% of site area, depending on local zoning codes.
6.1	Storm Water Quantity Control	1	1			D	Reduce run-off quantity by reducing impervious surfaces or increasing on-site infiltration. Calculations for compliance depend on existing site conditions and other site specific factors.
6.2	Storm Water Quality Control	1	1			D	Capture and treat run-off from 90% of average annual rainfall.
7.1	Heat Island Non-Roof	1	1			C	Provide shade, reflectance or open grid system for 50% of hardscape, or place 50% of parking under cover.
7.2	Heat Island Roof	1			1	D	Use highly reflective roofing material for 75% of roof area, or green roof for 50% of roof area.
8	Light Pollution Reduction	1			1	D	Provide lighting controls on interior building lighting during night hours. Reduce and control exterior lighting to comply with ASHRAE 90.1-2007 standards.
WE	WATER EFFICIENCY	10	5	0	5		
PR1	Water Use Reduction - 20% reduction	X	X			D	Reduce potable water use by 20% from a calculated baseline.
1.1	Water Efficient Landscaping - Reduce by 50%	2	2			D	Reduce potable water use for landscape irrigation by 50% from a baseline calculation.
1.2	Water Efficient Landscaping - Reduce to zero	2			2		Reduce potable water use for landscape irrigation to zero or use no irrigation.
2	Innovative Wastewater Technologies	2			2	D	Reduce wastewater use by 50%, or treat 50% on site.
3	Water Use Reduction - 30% reduction	2	2			D	Reduce potable water use from a calculated baseline.
	Water Use Reduction - 35% reduction	1	1				
	Water Use Reduction - 40% reduction	1			1		
EA	ENERGY AND ATMOSPHERE	35	10	2	23		
PR1	Fundamental Commissioning	X	X			C	Contract with qualified commissioning agent for basic scope of commissioning services.
PR2	Minimum Energy Performance - 10% / 5%	X	X			D	Improve building energy performance by 10% over ASHRAE 90.1-2007 energy standard.
PR3	Fundamental Refrigerant Management	X	X			D	No CFC refrigerants used in building HVAC&R equipment. Phase out plan for existing CFC equipment in existing buildings.

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			Likely	Needs Invstgtn	Not Likely		
1.1	Optimize Energy Performance - 12%(new) / 8%(reno)	1			1	D	Improve building energy performance beyond the baseline ASHRAE 90.1-2007 energy standard.
	14% / 10%	1	1				
	16% / 12%	1	1				
	18% / 14%	1	1				
	20% / 16%	1	1				
	22% / 18%	1	1				
	24% / 20%	1	1				
	26% / 22%	1			1		
	28% / 24%	1			1		
	30% / 26%	1			1		
	32% / 28%	1			1		
	34% / 30%	1			1		
	36% / 32%	1			1		
	38% / 34%	1			1		
	40% / 36%	1			1		
	42% / 38%	1			1		
	44% / 40%	1			1		
	46% / 42%	1			1		
	48% / 44%	1			1		
2.1	On-Site Renewable Energy - 1% of total energy consumption	1	1			D	On site solar
	3%	1	1				
	5%	1			1		
	7%	1			1		
	9%	1			1		
	11%	1			1		
	13%	1			1		
3	Enhanced Commissioning	2			2	C	Contract with qualified commissioning agent for extensive scope of commissioning services.
4	Enhanced Refrigerant Management	2	2			D	Use refrigerants in HVAC&R equipment that minimize contribution to ozone depletion & global warming. Likely HFC type refrigerants. Or use no refrigerants.
5	Measurement and Verification	3			3	C	Provide a plan for ongoing monitoring and potential correction of building energy consumption while in operation.
6	Green Power - 35% of yearly power consumption for 2 yrs	2		2		C	Purchase electricity from renewable sources for 35% of total electrical use per year for a 2 year period. Can be satisfied by the purchase of renewable energy certificates for 35% x 2 yr equivalent.
MR	MATERIALS AND RESOURCES	14	10	0	4		
PR 1	Storage and Collection of Recyclables	X	x			D	Provide recycling for paper, cardboard, glass, plastic, and metal.
1.1	Building Reuse - Maintain 55% of structure & shell	1	1			D	Provide portion of building to remain existing.
	Maintain 75% of structure & shell	1	1				
	Maintain 95% of structure & shell	1	1				
1.2	Maintain 50% of interior non-structual elements	1			1		
2.1	Construction Waste Management - Divert 50% of construction waste from landfill	1	1			C	Divert construction and demolition debris from landfill disposal or incineration
2.2	75%	1	1				
3.1	Materials Reuse - 5% of materials by cost	1			1	C	Use salvaged, refurbished, or reused materials for 5%/10% of total project materials, by cost. Materials can be purchased from salvage or refurbished or reused from on-site.
3.2	10%	1			1		

LEED 2009

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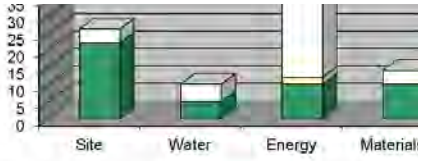

	LEED 2009 Credit	Points	Point Status: Likely	Point Status: Needs Invstgtn	Point Status: Not Likely	Design or Constr Submittal	Compliance Requirements
4.1	Recycled Content - 10% of materials by cost	1	1			C	Use materials with high recycled content such that those materials constitute 10%/20% of total project materials, by cost.
4.2	20%	1	1				
5.1	Regional Materials - 10% extracted, processed, and manuf locally	1	1			C	Use materials that originate and are manufactured within 500 miles of the project site such that those materials constitute 10%/20% of total project materials, by cost.
5.2	20%	1	1				
6	Rapidly Renewables - 2.5% of materials by cost	1			1	C	Use materials produced from rapidly renewable sources such that those materials constitute 2.5% of total project materials, by cost.
7	Certified Wood - 50% of all wood materials (TO BE REVISED PER SEPARATE USGBC REVIEW - LATE 2009)	1	1			C	Use wood produced from FSC certified sources such that those materials constitute 50% of total wood products used on the project, by cost.
EQ	**INDOOR ENVIRONMENTAL QUALITY**	**15**	**11**	**0**	**4**		
PR1	Minimum IAQ Performance	X	x			D	Design project to comply with ASHRAE 62.1-2004 ventilation standard
PR2	Environmental Tobacco Smoke Control	X	x			D	Designate facility as non-smoking and locate exterior smoking areas 25' from entries.
1	Outdoor Air Delivery Monitoring	1	1			D	Install monitoring systems to ensure ventilation requirements are being met. Outdoor air measuring stations and CO2 monitoring for densely occupied spaces.
2	Increased Ventilation	1			1	D	Increase outdoor air ventilation to improve indoor air quality. Several methods to achievement.
3.1	Construction IAQ Plan - During Construction	1	1			C	Implement a construction indoor air quality plan per recognized standards, protect on-site materials, install MERV 8 filters in any permanent HVAC equipment used during construction
3.2	Construction IAQ Plan - Before Occupancy	1	1			C	Implement a construction indoor air quality plan for building flush out before occupancy, per LEED standards.
4.1	Low-Emitting Materials - Adhesives and Sealants	1	1			C	All products used inside the building envelope shall comply with the recognized standards for low VOC content.
4.2	Low-Emitting Materials - Paints & Coatings	1	1			C	All products used inside the building envelope shall comply with the recognized standards for low VOC content.
4.3	Low-Emitting Materials - Flooring Systems	1	1			C	Flooring products shall comply with "FloorScoore" standard, carpet to be Green Label Plus certified. All flooring adhesive to be low VOC.
4.4	Low-Emitting Materials - Composite Wood & Agrifiber	1	1			C	All products used inside the building envelope shall contain no added urea-formaldehyde.
5	Indoor Chemical & Pollutant Source Control	1	1			D	Minimize pollutants in building environment by employing entry mats, enclosing and ventilating hazardous chemical spaces, and installing MERV 14 filtration in HVAC equipment.
6.1	Controllability of Systems - Lighting	1	1			D	Provide individual lighting control for 90% of building occupants, and adequate control in multi-occupant spaces.
6.2	Controllability of Systems - Thermal Comfort	1			1	D	Provide individual comfort control for 50% of building occupants, and adequate shared control for all multi-occupant spaces.
7.1	Thermal Comfort - Design	1	1			D	Design HVAC systems to meet ASHRAE 55-2004 standards for thermal comfort.
7.2	Thermal Comfort - Verification	1	1			D	Implement a thermal comfort survey of building users at 6 to 18 months after occupancy, and plan for corrective action at a 20% dissatisfied response.
8.1	Daylight (75% of occupied spaces)	1			1	D	Design the building such that 75% of occupied spaces receive adequate daylight, as calculated or tested per LEED ref guide.
8.2	Views (90% of occupied spaces)	1			1	D	Design the building such that 90% of occupied spaces have views to the outside, as calculated or tested per LEED ref guide.
ID	**INNOVATION AND DESIGN PROCESS**	**6**	**3**	**1**	**2**		
1.1	95% construction waste recycling	1		1		D (or C)	Per applicable credit from above

LEED 2009

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			Likely	Needs Invstgtn	Not Likely		
1.2	Green Housekeeping	1	1			D (or C)	Implement a green housekeeping program to include a statement of purpose for the program, a commitment or contract, Green Seal compliant materials, and documentation of green cleaning policies and procedures.
1.3	Green Education Program	1	1			D (or C)	Implement a green education plan to include 2 of 3 aspects : signage program highlighting sustainable building features, case study or manual transmitted to USGBC, outreach program/building tours.
1.4	Reduced Mercury in Light Bulbs (per requirements of LEED for Existing Buildings, MR prereq 2 and MR credit 6)	1			1	D (or C)	Install chem free process water treatment. The most prolific system being electromagnetic treatment of cooling tower water.
1.5	Low-Emitting Systems Furniture & Seating (per requirements of LEED for Commercial Interiors, EQ credit 4.5)	1			1	D (or C)	For all florescent and metal halide light fixtures, install low mercury content type bulbs.
1.x	Plug Load Energy Reduction (5% of total building energy use)					D (or C)	LT + narrative & support docs
1.x	Other alternate					D (or C)	Reduce plug load energy, typically by the implementation of flat screen computer monitors.
1.x	Other alternate					D (or C)	
1.x	Other alternate					D (or C)	
2	LEED Accredited Professional	1	1			C	LEED accredited professional on project team
RP	REGIONAL PRIORITY	4	3	0	1		
1.1	Total of 4 possible points of 6 designated credits. Zip code 55101, SSc6.1 or SSc6.2 or WEc1 Opt. 2,	1	1			D (or C)	Per applicable credit from above
1.2	MRc2(75%)	1	1			D (or C)	
1.3	MRc5(20%)	1	1			D (or C)	
1.4	IEQc8.1	1			1	D (or C)	
	TOTAL POINTS	110	64	3	43	D =	#REF!
						C =	21

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* This matrix is to be used as a planning tool and in no way guarantees LEED certification at any

OTHER LEED COSTS

Project Registration	55101	SSc6.1	SSc6.2	WEc1, Opt. MRc2(75%, MRc5(20%)
USGBC Review Fees				