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Profile - The Jewish Reconstructionist Congregation, Evanston, Illinois

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THE ROOFTOPS PROJECT

Photo: Steve Hall from Hedrich Blessing

Profiles

The Jewish Reconstructionist Congregation, Evanston, Illinois

A religious congregation envisions a new building better suited to its needs than its existing facility. But the location is perfect at its present suburban property. How might it start over while also observing green design principles? Rooftops Project team member Carlee Cooper and Professor James Hagy tour the new home of the Jewish Reconstructionist Congregation in Evanston, Illinois, with **Michael Ross** of Ross Barney Architects. It is the first place of worship in the United States to receive a LEED Platinum designation.

RTP: This spectacular new building was a few years in the making. How did you first get involved?

Michael Ross: Building projects do take a long time to actually get programmed, designed, and constructed.

RTP: And funded!

Michael: Plus funding, which is a big thing. We were hired to work with the Jewish Reconstructionist Congregation [JRC], in late 2003. The building wasn't done until February 2008. And that isn't even thinking about the work the congregation's committees had done before they hired the architect and engineers to do the job.

RTP: How were you selected?

Michael: We interviewed. The congregation was looking for a firm that had knowledge and some experience with sustainable construction. So we were hired. In 2003, the sustainable movement was starting to gain real steam but it hadn't become established. Now, 10 years later, most firms have someone on their staff that knows about sustainability and how to design into it. I think there has been a real transformation in the marketplace in that respect.

RTP: When you were hired, the congregation's existing building was located on this site. Why wasn't it suitable? Was it size, or condition, or function?

Michael: It was a combination of masonry and some steel construction. There was an original building, which had been added onto at one point. There were a lot of problems with it that were hard to solve. It was dismal, sort of dark and dreary, in my opinion. The social hall was in the basement. It had low ceilings, no natural light. So it was not a pleasant space for events. Members of the congregation that wanted to hold their children's bar or bat mitzvahs were looking elsewhere. The classrooms were not adequate for the number of students they wanted to teach. It was too small for the congregation and the programs it wanted to run, with only around 20,000-22,000 gross square feet.

RTP: Had the congregation discarded the option of going somewhere else, to a new site, before you became involved?

Michael: No, they had not discarded the idea. Our first step was to do the programming, which meant sitting down with the various leadership groups, the rabbi, the committees, and interview them to find out what their needs were. The congregation also had a very popular rabbi, who is still here today. A religious leader that is very popular helps grow the congregation. The result of our work was a building program requiring 40,000 gross square feet of space. But our zoning and code analysis showed that the footprint at this site, and the maximum height for any new construction, limited what we could

Photos: Steve Hall from Hedrich Blessing

build to only 30,000-32,000 gross square feet. A new building on this site would be undersized for what the congregation wanted to do. So we worked with them to try and find synergies within the design, where spaces could be flexible and used for more than one function.

Concurrently, the congregation searched for a new site. There are not a lot of free properties, especially in the northern suburbs of Chicago. The congregation was really connected to the Evanston community, so JRC didn't really want to move too far from where its roots are. We looked at all sorts of options, other places that they thought might work. None of them were great. The congregation explored other solutions: another synagogue where it could share space, or even renovating the original synagogue on this property or building an addition by using an adjacent parking lot.

RTP: Where did that process lead?

Michael: After I worked with the board of the congregation, the board members reached the decision that the right solution was to tear down the original building and build here. This was a big, transformational change. The actual design and construction involved lots of additional decisions on details. They also had to make arrangements with a local church to hold services during the construction period, while this facility was being built. And then, of course, these new buildings aren't cheap. They were doing fundraising this whole time. They did it really well. They were very motivated.

RTP: What is your approach to engage a client, especially one with so many involved members, in the design decision?

Michael: Architecture firms have different designs methods to get to a solution for their clients. We generally feel like there's not one best solution for any building problem. There are a lot of good solutions. So, we generally do at least two, at most three, solutions, and they are usually very different from one another. We don't want to give them something that is just a different exterior or façade because that really isn't giving them choices on the ways they could function. Then we elicit a conversation about what they want, how to operate, and what works best.

With multiple designs, you can easily see what is different and give them real choices about how they want to operate.

Some clients have a lot of experience doing projects. For example, universities are constantly renovating and building new facilities. But some organizations, like a not-for-profit of this size, may only build a building once in a lifetime.

The new building can help the organization achieve its mission, what it wants to accomplish. But people tend to talk about what they know, how they operate now. You have to get them thinking beyond the way they did it in the past. Sometimes that's not the best solution. There's usually a reason why they are building something new. A lot of times it has to do with functionality.

RTP: What strikes you as unique about designing places of worship versus other types of not-for-profit facilities?

Michael: Designs for religious structures can be controversial. When you program a church or a synagogue, the client often wants all the functions to be on the ground floor. They are not meant to be two-story facilities because everything is important.

That being said, with the limited space we had, this facility needed to be layered. The chapel, business offices, and daycare, which are the most used spaces during the week, are on the ground floor. So most of the traffic is down here. The religious school is probably the second most used space, although it only operates Tuesday through Thursday nights and Sunday mornings. That is on the second floor. There is multifunctional space that can be used for board meetings, committee meetings, what have you.

In some ways the least used, but the visually most important, space is the sanctuary. We designed that on the top floor. If you have an elderly congregation, getting up to the third floor can seem a little controversial. There were advantages, however, from a construction perspective. You can get the clearest span and not worry about floors above that need support. And we were able to make it a little taller than the rest of the building and still be within the municipal height requirements.

RTP: The levels are all connected by monumental stairs, with a glass wall overlooking the streetscape. How did that idea develop?

Michael: The congregation had the idea of creating the grand staircase to the third floor sanctuary. They really embraced this idea of ascending to their spiritual space. This staircase is very visible. We also have a couple of elevators for accessibility.

RTP: Why were the exterior-facing stairs important?

Michael: We wanted it to be a design feature. But it also plays a role in sustainability. Two things you want to control are heat gain and, especially in the Midwest, the western wind. This major stair is a transitional space between the inside and the outside. It acts almost as a buffer to the rest of the building. It can be a little less comfortable in temperature. It doesn't have to be heated and cooled like an occupied space. That helps save energy. On the backside of the building, we have the two egress stairs, which also act as buffers from the north winds on that side.

RTP: How did the congregation approach the design decision process?

Michael: It was very interesting. What the rabbi told us in our first interview is that tradition has a vote but not a veto. I think that reflected the Reconstructionist Congregation's approach to traditional Jewish doctrine: to look at the past and to consider it (they keep a kosher kitchen, for example). But they are also very socially liberal.

RTP: The JRC also became engaged and committed to sustainable design for the project. Do you think this was influenced by JRC's religious perspective?

Michael: Yes, they were very motivated to have an environmentally sustainable building. A Reconstructionist phrase they have translates to "repairing the world." There also was no question that they wanted it to be accessible. We were grilled about it. It was one of the reasons that there is no basement in the building, although there was one in the original facility. It can pose water problems, it doesn't create a nice space, and it's just another level to get people up and down.

SUSTAINABLE STRATEGIES

1. Reflective roof mitigates heat island effect and keeps building cooler.
2. Stormwater detention system eases the impact of storm water on the environment and municipal system.
3. Landscaped with native and adapted plants, included transplants from the original landscaping. No permanent irrigation used for landscaping.
4. Exterior light fixtures have full cut-off optics to mitigate light pollution.
5. Access to daylight and views for over 90% of the spaces.
6. Operable windows in all spaces for option of natural ventilation.
7. Spectrally selective and low emissivity glazing used to reduce heat load and harmful UV rays.
8. Ceremonial door cladding milled from on-site crimson maple trees that were displaced due to new construction.
9. Reclaimed wood from mushrooms houses used for exterior siding.
10. Gabion site walls made from locally demolished brick, concrete, and limestone.

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One of the original design ideas was to use the rubble of the demolition, the concrete and broken brick, for the new exterior. We were going to hold it in a gabion, which is a metal rain-screen construction with a waterproof membrane. It was a very cool idea. But the idea of using metal mesh was a little brutal; they didn't want to go that direction. It would have been a problem anyway, because we would have had to store the rubble after demolition and there wasn't a lot of room on site. Instead, we crushed the rubble and used it for engineered fill for the new building's sub-base. It was sustainable. The rubble all stayed here and it did not require transportation on and off site. For the exterior, we expanded the use of reclaimed wood, which was an element of the original design.

RTP: Almost every not-for-profit has financial constraints. How were the design criteria influenced by budget?

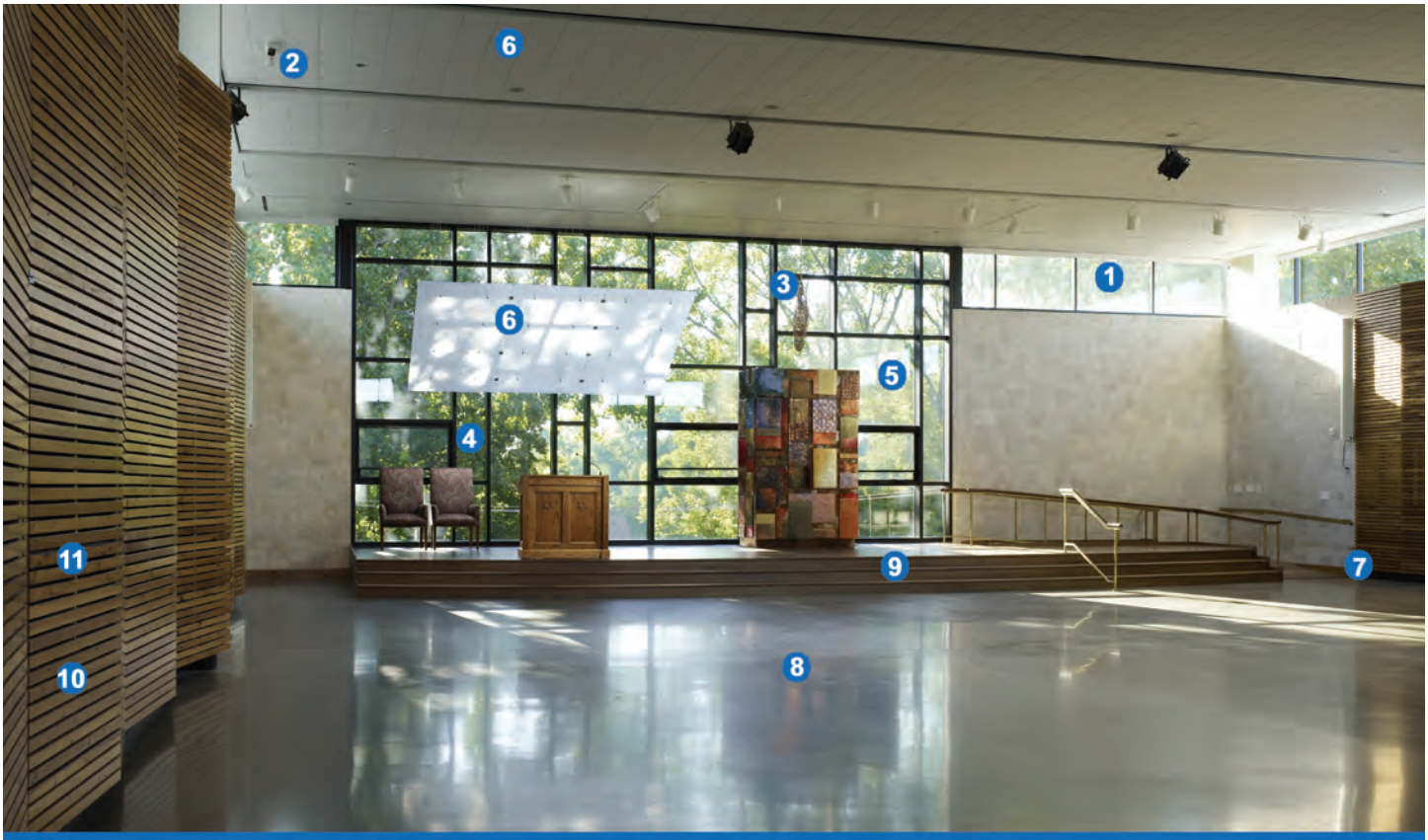
Michael: We were extremely cost-conscious. We were working with a local construction firm that was hired by the congregation to do cost estimating and the budgeting. The initial designs were out of budget with what they wanted to spend. This type of false start is not unusual. So we regrouped after that and simplified the design a lot. The elegant cube at the center of the final design was really a response to simplify the construction and to maximize its efficiency.

RTP: Do you think the false start can be a way to show people involved in the design process why certain elements couldn't be adopted within their budget?

Michael: Perhaps. People may understand why you can only do so much, why you couldn't build 10 more classrooms. But it is inefficient; when you have a false start, you lose time.

RTP: Was there a value-engineering phase?

Michael: I really don't like that term, because usually what gets engineered out is the value and only because of the cost. We believe in integrated design



SUSTAINABLE STRATEGIES

1. Access to daylight and views for over 90% of the spaces.
2. Dimming and photocell controls for maximizing daylighting.
3. Eternal light is solar powered.
4. Operable windows in all spaces for option of natural ventilation.
5. Spectrally selective and low emissivity glazing used to reduce heat load and harmful UV rays.
6. Sound baffle and ceiling tiles made from recycled materials.
7. Low VOC emitting materials.
8. Polished concrete floor eliminates need for floor covering material, while providing a beautiful, low-maintenance and durable floor. Concrete uses recycled fly-ash in mix.
9. Bimah flooring milled from downed Chicago Park District black walnut trees.
10. Displacement ventilation system used in Sanctuary.
11. Reclaimed wood from mushroom houses used for interior slat walls. Slat walls serve to hide ventilation system, while providing acoustical paneling.

ross barney architects

Photo: Steve Hall from Hedrich Blessing

with the fewest moving parts. We believe in not building any more than needs to be built. If you get to that point and still need to cut, then you're cutting things that add value to the facility.

In this project, I don't think it was too painful. For example, we were going to try and control the glare and lights in the main stairwell with a vinyl film with lettering, words, on the windows. It would have cast shadows on the walls; it would have looked cool. That was valued out. But it didn't harm the facility.

RTP: How did you meld the budgetary considerations with the congregation's strong desire to have an environmentally sustainable design?

Michael: We're always looking for ways to do something sustainable but on budget. One of the things you'll see throughout the building is that all the floors, except for the offices, are actually polished concrete.

RTP: It looks like a decorative surface?

Michael: No, that's the aggregate in the concrete mix. On this floor they decided to grind it deeper when it was polished, in order to expose it. But you can also see some cracking, which shouldn't have happened. It occurs when there is variant temperature during curing. One of the problems was that the south side gets the sun, and so it's more prone to the expansion and contraction because of the heat. The Midwest is horrible because you can have large temperature variations.

That was the other thing about doing sustainable construction. Sometimes you have to prepare your client for the unknown. Sometimes you can't control things. I still think it's a beautiful floor. It's very natural. They don't give you points in the LEED rating system if you decide not to use additional materials, as we did by not using floor coverings. I think they should give it more consideration.

With the reclaimed wood siding, I pointed out to the clients that they were not buying a manufactured product, too. The form and quality are going to be suspect. It is a risk. But whenever I run into congregation members, they really seem to genuinely love the facility. I want everything to be perfect.

RTP: Are the steel beams you used throughout the building also from recycled sources?

Michael: Almost 75 percent of steel used in the U.S. comes from recycled sources. So little comes from virgin iron ore anymore. In fact, 75 percent is low. There is probably a good chance this steel came from automobiles that were recycled. But it could have come from many sources, anything that was melted down and reused.

RTP: What other elements of the design did you incorporate in seeking sustainability?

Michael: All the floor-to-floor heights, except for the sanctuary, are 12 feet. They would normally be 14 feet. There is less volume to heat and cool if you keep your building compact. And all the spaces are individually controlled. The larger spaces even more so, but all the individual classes have their own controls. But we made the heights 12 feet not just to pursue sustainability, but because of the building height restrictions under the municipal code. That was really ambitious, because of all the ducts. I worked with the mechanical engineer to figure out how to use the hallways efficiently.

RTP: Did you select the mechanical engineer?

Michael: Yes, we chose the design team. And we brought in the landscape architect and the structural engineer. Some clients want to pick their own team. But if they choose someone you wouldn't, or with whom you had a bad experience, it can hurt. In other cases the client will issue a request for proposals in which you put together the team and they choose the team.

RTP: Were there other sustainable techniques that you had in mind for this building that did not get implemented because of the cost?

Michael: There are things we originally wanted to do but didn't. One thing I really wanted to do was solar panels. They really couldn't afford it. The upper roof is designed for it, though. If it ever becomes affordable, they could do it. We did plan for it if it ever becomes affordable for them. The life cycle cost analysis showed it was not the best thing to do. They also wanted solar hot water heating, but again the life cycle cost analysis proved it wasn't worth it. There were better places to spend their money.

RTP: Do clients typically need some coaching in making design decisions?

Michael: Yes. There are a million decisions made in any building project. Some decisions may be bigger, more important, more obvious, but this is a big puzzle. All the building systems need to work together. Even the stairs are influenced by the 12-foot ceiling heights. The stairs fit pretty perfectly in the length of the building we had. If they were 13 feet, there would have to be another landing on the stairs.

RTP: And in this design you were using some solutions for the first time. Does this take extra time and work for your architectural team?

Michael: You have to do your homework and research, find out if it's been done elsewhere. The gabion baskets had been used in other building construction.

RTP: But not nearby.

Michael: No.

RTP: How do you approach consensus building when you have a client that is a member-based not-for-profit like a place of worship, made up of a many, many different voices?

Michael: That *is* a skill. When we are hired and we have a client that has a lot of people to satisfy, we really believe in starting off with a meeting to set goals and objectives. Everyone can voice opinions and can hear and recognize what everyone else is saying. You shouldn't end it right there, but bring back the design as it develops and revisit those goals and objections to see if you are really meeting their top priorities. Consensus is best if you keep people involved and give them a voice. Most people are not going to get 100 percent of what they want, but if they feel as if their ideas and desires were considered, then you can get people behind the project.

RTP: Do some innovative building systems require the client to have special experience or training in order to operate and maintain them?

Michael: Sometimes. Often, today's building technology can gather performance data. But unless you have someone who can interpret the data, it may not be helpful. In this facility, there was something not correct with a sensor. It performed very, very well from an energy perspective the first year. But it actually performed better the second year, because people were paying attention to the data and saying, "This shouldn't be happening."

RTP: We are on the third floor now, walking through the lobby and into the sanctuary.

Michael: Yes. There are only two major spaces on this floor. One is the kitchen, which was designed large enough to be a teaching kitchen. The idea was that the children in religious education could use it, since cooking is a part of the curriculum. It is a nice, generous kitchen.

RTP: There is a lot of natural light.

Michael: We treat it like any other facility, so why shouldn't it be day lit and have views? People have to work in there. There are solar tubes, which we used here in the kitchen and in the lobby on this floor. Then we added a little window, so you can look from the kitchen into the sanctuary and see if they are ready for another course, or where they are in the program. And storage is always an issue. We did try to design to give them as much as possible.

RTP: Were outside rentals an objective in the programmatic design?

Michael: Yes. I was just asking how the rentals were doing. They said they get a lot of local not-for-profits looking for space for days other than Fridays and Saturdays, when the building is most active for the congregation's own needs.

RTP: What is this giant mechanical installation in the sanctuary ceiling area?

Michael: It is a huge aircraft hangar door that we modified. I said there are only two spaces, but actually this door comes down from the ceiling and divides the space. One third can become a social hall while the rest becomes a little smaller sanctuary, which is a good size for most of their services.

RTP: You didn't come up with this idea by flipping through a hardware catalog!

Michael: No. We had done a couple of projects with unusual doors to divide space. We had used an aircraft door at our library project at the University of Florida because they had to close off the main library at a certain time. It wasn't quite as big as this. This space is 55 feet wide. We ended up working with an aircraft manufacturer, and it's actually very quiet and effective.

RTP: The ventilation design here in the sanctuary also looks novel?

Michael: We had the idea to use displacement ventilation. It is a very sustainable method because all of the air is coming from the wall, at a higher temperature than a normal air conditioner. It travels around the floor and then hits a warm body and goes up. So you become part of the system itself; your body heat helps move the heat.

There are some limitations to it. It's a low velocity system. So this is about the maximum size for a room in which you can do it effectively. Behind these slat

Drawings: Ross Barney Architects

walls is all the air distribution. You need a lot of wall space to do it right. This is why we needed the aircraft hangar door rather than a traditional moveable wall divider. It would have eaten up wall space.

RTP: We've visited this space multiple times, and it always looks purposeful, although it has been set up in different ways. It is a testament to its functionality. How did you achieve that?

Michael: When we designed it, we laid it out a bunch of different ways to show its flexibility. The congregation loves it. In using the space, they have discovered, too, that the slat walls mean that they never have to use glue or nails to hang things. They just clip things over the slat walls. They hosted a wedding and hung banners. It was an unintended consequence that turned out to be a good idea. And all the wood—the walls and the exterior—is reclaimed cypress from the same source in New York.

RTP: How do you source that?

Michael: We had to do the research. With sustainable design, you really have to show what's available. In this case we found the source, we actually explored the quality, the congregation actually prepurchased it, and then we had it shipped here. It also had to be milled correctly.

The slat wall using the reclaimed material was originally about acoustic design. The sound is controlled by large-scale/small-scale diffusion to break up the sound energy. You don't want flat walls; you want them to have variations. We took the acoustic engineer's principle and applied it in a pleasing way. The whole idea is to hide everything. You'll see that nothing is obvious about the system. You can't see any air return or supply because it's all coming from the wall.

The other thing about displacement in a high space like this, which is 18-feet tall, is that you really only need to heat and cool the first seven feet, because that's where the occupied space is. So with the advent of air conditioning, typically you have all this space and you're blowing air down. You're using a lot of fan power and energy to push the air where you want it. This is becoming a common strategy, under floor distribution, especially in tall spaces.

Then, of course, you want to have it day lit. This is really day lit. All the lights in the facility that have access to daylight have occupancy sensors too.

RTP: What inspired you to place such a big window right behind the bimah at the front of the sanctuary?

Michael: The idea of the picture window as a main focus took root because we are up in the tree canopy above the residential neighbor. Your vision of the trees isn't being impaired by a bunch of houses.

RTP: And the benefit of being in a suburb is that you're not going to lose that?

Michael: Right, it will probably be preserved for a long time. Then to control glare, there are actually shades that come down. The bimah is made from black walnut from fallen trees from parks. So it's another reclaimed source. It's nice; you couldn't really find black oak like that on the market.

Photo: Steve Hall from Hedrich Blessing

RTP: Were any elements of the construction a particular challenge from a LEED perspective?

Michael: LEED encourages sourcing your material within a 500-mile radius. But we couldn't do that with the stone the client wanted. The stone is actually from Jerusalem. It comes from the West Bank, and it's not a stone; it's more of a tile. It was the one thing that has a Jewish connection that we shipped in from far away. You'll see it's used here and also used a little bit in the chapel, and then in the main stairwell.

On the other hand, while almost all Jewish sanctuaries have eternal lights, ours here are powered by a solar panel on the roof. There is one in the chapel, too. There's a battery associated with the panel that helps store a little bit of energy. We looked at using solar more extensively, but the life cycle analysis rarely pays off.

RTP: Had the congregation intended to seek LEED from the outset?

Michael: It was a conversation we had with the board. They had to vote on it, and decided that's what they were going to do. The vote was to achieve the highest LEED certificate possible within the budget they had. In the design process itself, there is really no extra charge to design sustainably. We do it anyway. The extra costs are in the certification process, which can be costly. The biggest expenses are minimum energy modeling and enhanced commissioning by having an outside agency come in.

RTP: The coat racks are out in the open. Is it easier for accessibility by guests, especially at big events?

Michael: Yes, you don't need an enclosed closet. You can make it part of the space. A lot of people design a closet to walk in, walk out. You're waiting for people.

RTP: How did the client handle project management during construction?

Michael: JRC kept us on board during construction, and we attended the construction meetings. But we weren't out here every day; that's not part of our services. It gets very expensive. We'd love it if clients would pay us for that! They had a consultant during the construction period. And they did a lot of their project management themselves.

RTP: Some clients may think the architect is out at the site every moment supervising throughout the construction?

Michael: That can be an issue, because the expectation isn't realistic. It costs money for the architect or design team to provide that level of service. Even if we were out here every day, that would not mean we would see everything go in and be installed correctly.

RTP: In the classrooms, the windows are placed asymmetrically. The children can see out better that way?

Michael: I borrowed an old idea. One window is high and one is low. So that will help encourage air circulation in the classroom.

RTP: As it turned out, the project qualified as Platinum, the first place of worship to enjoy this highest level designation, and all within the congregation's budget parameters. There must have been a great sense of accomplishment for both your team and the members of the Jewish Reconstructionist Congregation. What would you tell other places of worship that are facing new construction or substantial redevelopment as they consider whether to pursue LEED principles and perhaps LEED status?

Michael: First, designing and constructing a new sustainable building, even to LEED standards, does not mean a large increase in construction costs. JRC, at LEED Platinum certification, probably only cost 5 to 10 percent more. That, coupled with an energy-efficient HVAC design, will result in operational cost savings. Second, make the decision early to design sustainably. The largest impacts on how "green" the building will be are from early passive design strategies such as building massing and site orientation. And last, select an architect/engineering team that is knowledgeable about sustainable construction and will work with the congregation to explore multiple solutions.

More about LEED

LEED stands for Leadership in Energy and Environmental Design, an independent certification framework developed by the U.S. Green Building Council ("USGBC") and now administered by the Green Building Certification Institute ("GBCI"). LEED-NC is the certification standard used in new construction projects (there is also a certification standard for existing buildings). The process requires project registration, planning, data collection, reporting through an application process, and independent review and verification leading to conferral of LEED certification. LEED also has programs monitoring the operating performance of completed projects. You can find out much more about LEED at the U.S. Green Building Council's Web site at www.usgbc.org.

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