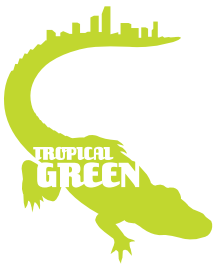


“Urban Eco-Sustainable Networks”

Michael Singer

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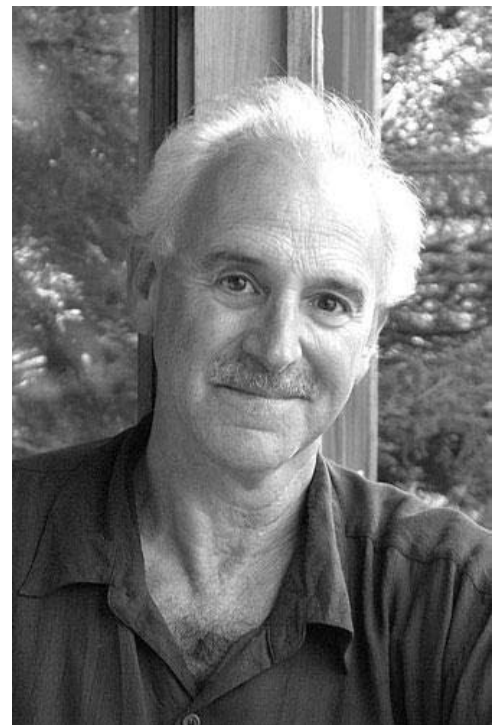
The first Tropical Green Conference, organized by *Metropolis* and Zyscovich Inc., and sponsored by Shaw Contract Group, Ultron, Haworth, and Carnegie was held on February 9-10, 2006, at Miami Dade College Wolfson Campus. The following is a speech delivered by Michael Singer entitled “Urban Eco-Sustainable Networks.” Singer is joined by Calen Colby from Dest Associates and Ramon Cruz of Environmental Defense. The talk was moderated by *Metropolis* editor in chief Susan S. Szenasy. Look for Tropical Green II, returning to Miami soon.

Michael Singer: Everything is infrastructure. Infrastructure is part of what helps us live, although there are many aspects of our lives where it may not be immediately evident. Things that help us deal with our waste, our water, and our parks are infrastructure. Shopping centers are certainly a part of our infrastructure.

Going through some of the opportunities for infrastructure, there is the notion of a marketplace in the city and other areas like a park or a pump station. There is also the question of how people understand. Often in our culture what is out-of-sight is out-of-mind. Part of my mission is to keep infrastructure in-sight and in-mind, which in effect connects communities.

Take for example the big boxes, like Wal-Mart and the others that are around us all the time. Do they have to be what they are? Is there an opportunity to expand the meaning of these places and their effect on our everyday lives? In Miami these are areas that need to be addressed. Part of what I want to put forward is that we go from this conference and start addressing them. Let’s look at these places as opportunities to offer new thinking.

The Solid Waste Transfer and Recycling Center in Phoenix, Arizona, that Linnea Glatt and I designed in the late ‘80s is an example of community-based infrastructure. People produce garbage, it’s a major part of our lives. In Phoenix Ron Jensen, the very forward-thinking public works official in



Michael Singer

Photos courtesy Michael Singer

the late 1980s, was saying that a place dealing with garbage needs to be part of the community, and needs to understand issues around recycling.

This is one of those projects where a client says, “I need 2–3 acres under a roof, and I’m going to make this place a place for visitors.” The site itself is about 20 acres, so this is a big area. It’s all paved, with 500 tractor-trailers of garbage coming in every day. That’s almost one a minute. We could call this place anywhere—it’s a box. This was the late ‘80s. Myself and Linnea Glatt, two artists, were given the problem of making this a place where people can understand the issues of recycling and connect to the realities of how they effect the environment around them. They were saying, “Do that with a piece of sculpture,” or “Do that with a piece of art.” No, we said, we’ve got to rethink this whole place and what it can be.

Joining me here today is Calen Colby, an engineer, and Ramon Cruz, who works with Environmental Defense. I want to point out the importance of teamwork. Integrated design means that people work together from different professions, bringing their point of view to the problem-solving table with respect. For this project then I said, “We’ve got to address this whole place.” I also said, “I’ve got to bring together the kinds of professionals who can come up with answers and also question the assumptions of what places like this are.”

The questioning began with remodeling and rethinking. How does the land relate to this place? The roofs? The structure? How does the box begin to be about where it actually is, and not about someplace in Missouri? One of the big problems with a standard recycling center is that when you’re sitting in Missouri [designing with your computer] and push the button, you don’t realize that in Phoenix the air flows from west to east. They wanted to put all the garbage on the west side of the building and the visitors on the east side. The client looks at it and says OK, but the client doesn’t suddenly realize on their own that they would be way ahead if they just flipped the box so that their offices could be up-wind rather than down-wind.

In the end, the facility became architecturally recognized. In the early 1990s Herbert Muschamp chose a garbage facility designed by two artists as one of the *New York Times*’s eight most important buildings of the year. Now that really picked up attention. What is a garbage facility, a landfill facility, doing on that list? It really changed the way people thought about these places. This has not become an icon within the city. It’s “the dump,” but it is also an amazing place to visit. Thousands of school kids go there, it is a public space that people can use. We rethought all the programs of that box and added to it. You’re probably sitting there saying, “God, how much did this thing cost?” Well the box [the engineering firm had proposed] was bonded for \$18 million. Ours was built, with all of the equipment in it, for \$13.5 million. And it happened because the team of engineers and architects we worked with, and our own questioning, changed the way we addressed the site, as well as the way we looked at materials and how they went together. We created a very special place for less money.



Solid Waste Transfer and Recycling Center in Phoenix, AZ



Public space at the Solid Waste Transfer and Recycling Center

People come here and take the tour. This is the marketplace for recyclables, which is also used for community events. The idea is that these places have more than one function in our community. They need to evolve. Bill [McDonough, Tropical Green keynote] talked about regenerative design, evolving and making places that generate health in the larger sense of the community. Most people in public works have little offices with no windows, or else they have trailers and bunkers. We put them all into a courtyard with open air and a place to breathe. This is an exciting structure, people can walk through and understand it. There's also the symbol for the city, which is the trust that carries the building that you can see from downtown.

On top there is almost a mile of landfill, which was filled within about 25 years, six stories. The right side of the landfill is our site and the next question was, "What is this place? What can it be now that we've done the recycling center?" On one side of the landfill is a natural system of the Salt River. On the other side is an effluent channel. Forty million gallons of water will be sent down this every day, that's extraordinary for the desert, and it's clean effluent. There is a south-facing slope of the landfill for almost a mile; that landfill is filled with methane. These are incredible resources. Working in a team with the University of Arizona engineers and other thinkers, we looked at this as the place where the true eco-industrial park could happen, the place where waste becomes a resource for another industry. Now we're beginning to understand that we can mine these landfills and reuse them. The landfill provides the methane for a cogeneration system that is on the site that will generate the power for all the buildings—it's now generating the power for the recycling center.

What kind of industry can be there? Well, this is the desert, we have water, there's a lot of opportunity for agriculture, not for edibles, but for plant material that can be used for other purposes and also interconnecting with light industry. This is the imaginative part where a master plan has transformed a landfill into a regenerative place that brings health to the community. How do these industrial buildings bring people into them? How does an industrial park become not just one of those out-of-sight, out-of-mind places, but a place where people have studios and research laboratories, where people work closely with industry and resources are flowing back and forth?

Let's look at power. We're faced with a need for additional power, and conservation has to play a role. Cogeneration gas-fire plants are state-of-the-art in many ways. They're going to be part of our communities. Do you want it anywhere near you? What can a power plant be if it has to be sited within an urban setting and become part of a community? What about clearing up brown fields and placing a power plant on them?

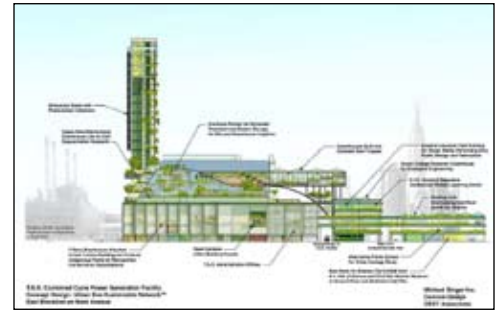
We started looking at what's possible in Greenpoint, Brooklyn. The first question is, What are the resources of this power plant? One great waste here is heat—they're making the power. Next, we've got eight acres of impervious surface, which gives us an enormous amount of rain water, 42 inches a year. These are enough resources to do something without taking anything out of the system.

And then I started questioning the building surfaces. What is the roof? We know about green roofs and their potential. How do we extend some of those roof surfaces? But also, what could the walls be—why aren't we rethinking walls as well? There's CO2 here and that's a resource. How can we use it? And then we look at the natural community. This is on one of the major flyways in the East for migrating birds. There's the opportunity for those eight acres of roof to become habitat through landscaping, which can also filter the collected rainwater into cisterns. We have photovoltaics and sunlight. The power plant can actually generate other kinds of power to operate whatever those walls and roofs might be. Looking at this network we're able to start imagining this place in a very different way. There are opportunities here for a growing system within an urban environment—an urban agricultural system. We also looked at ways the walls could relate to the wind and wind-louvers that move and create this constantly changing surface. And the structure to hold the kind of programs that not only supports the power facility, but the things that we want to have as part of it.

This is what it begins to look like. Across the way there's the Empire State Building in the fog, and there's the ConEdison facility on 14th Street—that's the tradition, and here's the future. This power plant is basically covered with greenhouses because it can receive the heat, so that's free. It is irrigated by the water that we take. For the plant material, we're in partnership with environmental groups from all around the metropolitan area because they need this plant material for regenerating wetlands and indigenous plants. They would have to go to upstate New York to find growers. They couldn't afford to have it grown in greenhouses where it grows very quickly. So suddenly the power plant becomes an apparatus for the community, culture, nature in the city, and so forth. Connected to it are artist studios. There's also a museum, so there's an opportunity for a cultural experience. Suddenly the whole place transforms into something that we don't think of as a power plant.

We worked with Ramon Cruz and Environmental Defense. They asked us, "How can we promote our policies—which are very powerful and very strong and very effective—into everyday community life where a situation like marine transfer of garbage in New York City is of dire consequence?" A study was done by Environmental Defense that showed that there are millions of garbage trucks on the road. If we can use marine transfer, we reduce enormous amounts of truck traffic, fuel costs, labor costs, and congestion. These systems were in place but were dismantled at a certain point. Now we've realized the need to bring them back. That whole system of marine transfer is very important to the city, but do you think communities are going to accept it around the waterfront when they look like this? They're concerned with their one function—bring a garbage truck in, dump the garbage, and barge it. And there is a real problem here with that one function.

The question becomes, How does marine transfer become connected to a community? How can we work with the community boards and show them that these places don't have to be unsightly? And it goes beyond just putting icing on the cake. We looked at the system and how the form follows function, asking questions like, "What is the turning radius of a



Plan for power plant in Greenpoint, Brooklyn



Typical marine transfer station

garbage truck?” Another big issue is the queuing of these trucks. They idle in line spewing exhaust. How can we get the garbage trucks to this place and have the driver turn the engine off and just take a coffee break or whatever? And if we want a simple car wash hook-up for the truck, how do we run it? Well, we have a solar collector on the roof that runs the mechanism that moves these trucks and they’re basically being wheeled around that turning radius and this becomes, as someone at Environmental Defense coined it, “the Guggenheim of Garbage.”



“The Guggenheim of Garbage”

We have to clean and store the trucks. Right now the city does that on land that’s very valuable. We want to incorporate this in one facility, so we start looking at the resources. We’re going to be washing the trucks, but don’t want to discharge that water into the Hudson River. Instead we can bring that water back up onto the roof, where it’s cleansed, treated through the wetland habitats we’ve built, and then stored within the walls of the facility so it can be reused for cleansing again.

The big box shopping center is around us everywhere, but we have a hero in Whole Foods. Their construction manager and manager of development, Kelly Mills, contacted us and said, “Whole Foods has this extraordinary opportunity to actually effect the way developers are thinking and bring the Whole Foods mission to the larger site.” The typical way of thinking is, “We have so much land we don’t have to worry, let’s just make another one of these cookie-cutter places.” But what if you start thinking about its potential for other functions, like maybe the land is more valuable than asphalt. We started looking at what happens if we put the parking under the building. Suddenly we make available incredible greenspace that becomes part of a community garden opportunity. The shopping center can then become a cultural center where there is natural environment and beautiful space that identifies why we’re here in Florida.

The strategies to increase greenspace include parking on top, parking below, and bioswales in the parking lot to clean the water. Next we looked at the store itself and began, in the same model as the recycling center in Phoenix, to see what we’ve got to do to these big boxes. One of the first things is break it up to bring light in. The north light here is the most spectacular. The south light provides an opportunity to produce energy. The roofs become opportunities to collect water which can be held in cisterns beneath the parking lot and then reused within the facility.

And what do the public spaces become? What does the store begin to look like if we start thinking of the landscape as habitat creation, and bringing people in Florida more in connection with the indigenous world? Why are we planting all this grass as though we’re living in Missouri or New England? We’re not, we’re here.

The visual arts complex at Florida Atlantic University is meant for both the public and the students to enjoy. It’s south-facing concrete, it cannot be used, no one sits there. Working with a group of students, and looking at South Florida water management best practices, we came up with a way to transform this place into a retention pond. We started by asking, “What are these storm-water retention ponds and what can they be?” Regulatory issues are important, and regulatory agencies are part of our team. It’s also



Visual arts complex at Florida Atlantic University

important to connect with the environmental organizations. Rather than worrying about treehuggers stopping a project, ask what it is they really want. We can re-envision these places to be healthy, and then it's a matter of telling people about it.

The South Florida Water Management District (SFWMD) wanted to know how people can come together to understand the issue of agriculture development and the environment. They wanted to demonstrate the role of the district in meeting the people's demands, so we started to think about the dynamic of the visitors center. We designed the room basically as a hydrolift that brings you up into this tower. We picked a height of 60 feet because that's the height of the change of water. At this level you start seeing the interconnection of agricultural development and the environment. The room goes up or down as it's filled with water and really demonstrates the message of what these systems are.

In West Palm Beach we worked very closely with SFWMD principles and Ken Reardon to re-envision how the city can connect better to its natural environment. How do you transform the grassy gateway to West Palm Beach to say that our land is valuable and retention of water is essential? How do we take 11-acre Howard Park and rethink the red mulch with cyanide in it, that no one walks on, and turn it into a place that celebrates the natural environment? How do we take the Convention Center retaining wall and make it a feature that filters the water as it comes off the hard surfaces and actually goes through the pond? The turning basin of Howard Park is where the Renaissance Project begins. We give that water an initial cleaning that helps as it goes through other systems before it goes out to Clear Lake. This is a way of rethinking places.

The waterfront in West Palm Beach is a wonderful project that we're working on. At the moment, no one goes there. There's no shade, it's just a place for cars. But we can transform it into a place for people that actually promotes the health of the community. We went to SFWMD and the Department of Environmental Protection and asked what they would do with this place if they could change it. They said that we've got to have transitional edges because storm water runs out into it.

Our team drew up a bunch of images that look at what that edge could be. Then we took the diagrams to our engineers and asked what the opportunities here are. Next we started looking at just the edge and how we can make it transitional while creating more space for people and habitat. Our plan includes a walkway that goes out into the water. Then we looked at the stagnant dredge holes which we can fill and start to make a habitat for sea grass. The outflows or storm water coming off of the city streets is now being treated on the waterfront edge, and out further are these islands that are a part of it.

You can see the transformation. Now the plan for the waterfront of West Palm Beach has a transitional edge, native trees that create shade, and is a place that people can relate to. It's being done in a very small area so we're able to work in very tight conditions.



South Florida Water Management District visitor center



Grassy gateway to West Palm Beach in need of transformation



Vision of the gateway's transformation



Vision of the transitional edge

Here's one that's actually built. This is in Grand Rapids, Michigan; it's a water edge. One of the most positive things here is that those old cottonwood trees are actually holding the bank. The Army Corps was going to tear them down and build one of those straight hard-edged walls. I said no, those are holding the bank, let's leave them and take credit for it. Then we started to build this stepped-water edge. Water from the city streets and parking lots above can flow in. As it gets planted and the plants start growing, suddenly this emerging mystery of shapes, forms, and foundations is serving not only as an aesthetic but also a functional part of cleaning in the city.

An opportunity came to work with the Danish partnership in Germany for a project in the Netherlands. Basically it looks like an office or research facility for the European Community Environmental Center and makes a statement about connecting the land with the building. The question was. How does architecture become the apparatus for natural systems? Within the atriums, plantings eliminate the need for air-conditioning in that climate, which is similar to Washington, D.C. All the offices open onto gardens in one way or another with fresh air. The parking areas are bioswales with permeable paving allowing cleansing. There's no need to mow the grass here, unless you need the mowed area for a play area. The idea was to plant the natural environment. It's beautiful, the butterflies and birds come here. The outside systems of water-cleansing, storm water and gray water, is brought to this created wetland and pond, and then brought back into the building. It's treated in the atriums, which are very thickly growing for air-cleansing. It's the lungs and the kidney of the building. And then the water is finally digested and cleansed through this feature in a second atrium; it drips down, you hear the sound, and the cistern collects it and sends it back to irrigate all of it and to reuse it.

Calen Colby: I was brought to Michael Singer's office while he was working on a power plant project. A community group wanted to do the kind of things Michael was doing to another power plant that I was working on. The company I was working for sent me to his office to try to kill it. He was the evil artist. I got to his office and realized that everything he was doing was absolutely poignant and something that we needed. We've been together ever since.

Singer: Calen has worked very closely with me on an organization called ISIS, an institute for civil infrastructure which is a part of the Wagner School. We're working very closely with educational programs for engineering. Civil engineering is where it's at. Calen is one of those rare, but hopefully now not so rare, engineers who says, "Give me the problem, I'll solve it. Show me what you want to do and we'll make it feasible and cost-effective." It is really great to have him.

Ramon Cruz: In part what we're talking about is process. Usually communities find out about these pieces of infrastructure when the bulldozers come and start working on the site. It's a very different approach when you create some concepts first, then go to the community and let them take ownership of some of the ideas. The reception is completely different. The more we can incorporate this in the planning process, the more different reactions we would have to this kind of infrastructure. For



Water edge in Grand Rapids, MI



European Community Environmental Center

Environmental Defense, as a national environmental organization, working with Michael has been a new experience. Now when we go to government officials and community boards to present some of these concepts, the dialogue is completely different.

Question from the audience: On the Phoenix project, did you have to do any remediation because it was a landfill?

Singer: The site of the recycling center was not on the landfill, so the landfill is a different issue. I love bringing these projects to universities and schools. So we brought that landfill project to the industrial design, architecture, and landscape architecture department of the Rhode Island School of Design. As a combined class they looked at the landfill as an extraordinary resource for mining. They developed a system that now—they were very ahead of the thinking—is beginning to be put in place.

One thing we did that saved a lot of money was to dig a retention pond rather than bringing in 20 feet of fill worth several million dollars, since we were in a flood plain area for the building. The retention pond became a filtration system that naturally treated the water. The fill for that we used right at the site. We did this in the '90s. The idea of using material on-site is now a basic tenet of LEED certification. We were at the forefront of that and it saved the project millions of dollars.

And then the rest of the built site for the master plan also is not toxic. But the landfill itself is something that is continually dealt with, but not built on.

Susan S. Szenasy: Were you working with Charlie Canon at the Rhode Island School of Design?

Singer: Yes, Charlie and I initiated what is called the Innovation Studio. I was invited there to actually get that started with Charlie. It has taken on infrastructure projects that we've worked on—they did the power plants, they've done the landfills, they've looked at marine transfer. We work very closely and things that come out of the research of students and the school actually becomes part of our solutions.

Szenasy: Can you talk a little bit more about community involvement and how you get people on board? That seems to be one of the big hurdles.

Singer: I really like that you asked that because I'm dealing with that in my own community in Del Ray Beach. What often happens is there's a name out there that says, "Let's have a charette and bring the community together." We really have to keep in mind that, unfortunately, these are usually political events. But now that we've termed this event "charette" we start to call it a "charade." What happens is the officials are thinking, "God, we've got to get public input on this so unfortunately we have to have a 'charette,' excuse me, 'charade.'" And what happens is you bring the community together but you already have an agenda of what you want to do, so the process is meaningless. But the community somehow believes they are being given an opportunity to participate.


We want to change the charade into something that's really about the community, to go in and educate, and present a program that lets people know what their opportunities are. Don't just go in and say, "What do you guys want for your city?" What are people going to say? "Well, I like yellow. I want it to be a Mediterranean world." These are not helpful comments. You've got to really get at the issues, people need to be educated about what's possible. When we do a real workshop we spend a lot of time first showing precedents to explain the possibilities to a community that doesn't really know. When you start showing people what might be possible, then you have real community participation.

So when the charettes, or charades, come to your area, please get active and demand that there be an educational process attached to it. Also bring in other thinkers. Don't just rely on the team the city hired to do this. Say, "I want to see many ideas about what this place in downtown could be."

Question from the audience: This is a wonderful example of how we can move the whole agenda of public works forward to the next era. This integrating of the natural systems is the new theme for public works of the future. We heard from [Tropical Green speaker] Rick Fedrizzi about the change in the building industry. How can we begin to see the change take place in the civil engineering sector? What are the ways that we can begin to transfer the lessons learned from the building community to the rest of the engineering community? What are the buttons to start pressing?

Colby: I was thinking yesterday about how to answer that very question. I thought a neat idea would be that instead of when a developer comes before a planning commission or a municipal administration with their lawyers and their engineers and their pre-made plan for the big box, what if those first set of drawings had to have that design charrette with all the townspeople and the meeting minutes from that charrette on the sketches they came up with? And what if that first set of documents had to be stamped by the planner, and the architect, and the engineer, as well as geologists. When somebody comes before me and says, "Hey, I need you to get this drawing out," I don't just put my professional engineer stamp on it and run it out the door. I stop and give it the time it needs. Those professional licenses are important. If you had to get that team together at the beginning you'd have more of this type of stuff.

Question from the audience: One of the things you brought up was the integration of public participation in the process, which means education to the general public and to professionals, and seeing that all these goals are for beauty and sustainability. One thing that I must bring up is the technical term charrette, which you called charade. In fact, what that means is that it addresses just the idea of public participation and a very energetic engagement of a given situation. And I do think that people actually do become engaged, that they do take ownership, and the best ideas really do come forward. So regardless of what they call it—for instance in Australia they call it "inquiry by design"—I think that the general idea of public consensus and common education is commendable and that's a vision that should be given great credibility.

Singer: Yes, and thank you. Just to quickly answer, I didn't mean to say we shouldn't. Just add the process of education and letting people know what's possible and then they enter that inquiry and that event with knowledge and know what to ask for. And that's great. Thank you. 

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Resources:

Author

- ▶ Michael Singer, <http://www.michaelsinger.com>

Agencies & Institutes

- ▶ Environmental Defense, <http://www.environmentaldefense.org/home.cfm>
- ▶ Florida Department of Environmental Protection, <http://www.epa.gov/projectxl/fdep/index.htm>
- ▶ National Center for Photovoltaics, <http://www.nrel.gov/ncpv>
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- ▶ South Florida Water Mangement Division, <http://sfwmd.gov>
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