-----A Facility That Educates and Works-----

A COMPREHENSIVE PROJECT

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ABSTRACT

----A Facility That Educates and Works-----

By: Michael R. Blake

"Our children don't inherit the Earth from us, we are borrowing it from them." This quote stated by Tom Lowe, a Natural Resources professor at Ball State University, is becoming more common and self-evident in today's world where environmental awareness and education are becoming more needed and desired. If there was ever an option of action or inaction, it surely isn't now. The option is relating to ecological soundness, environmental stability, and environmental education in a troubled society. We should move immediately toward the various aspects of trying to revitalize our Earth. There are too many aspects for one person to achieve environmental stability, but that person can attempt to take a "bite" out of the troubled picture. That person is I, the troubled part of the picture concerns education, and it is replaced by a facility that educates and works together as one.
---A Facility That Educates and Works---

The essence of this project is to assist people to think globally and to act locally, thus trying to eliminate the helpless feelings derived from thinking globally. This terminal project integrates: a compost facility that converts yard wastes; spent trees, shrubs, grass clippings, leaves, flowers and soil; into a nutrient-rich commodity called compost; and the education of the visitor about the process and its environmental benefits through an educational facility.

The basic concept of this project is to incorporate an educational facility within the context of a working recycling facility that is involved with an aspect of an environmental issue. The educational facility is to be organized within the working facility in such a way as to enhance the educational experience.

Studies have shown conclusively that the average American spends 95% of his or her life indoors: inside houses, cars, schoolrooms, offices, and bathrooms; inside the minor and major fortresses we have created to protect ourselves from the elements and wonders of nature, including other human beings.

The indoor environment has powerfully conditioned us to ignorance. Our ignorance is something to keep in mind as we make our decisions about how to exploit the natural world in order to maintain our standard of living (Cohen, p. 104).

My philosophy is that if one were to learn about the stream, then would not it be a more successful venture/experience if that person were
to visit the stream to learn about it?

**Definitions**

--- **Environmental education**: is defined as that education which deals comprehensively with both human resources and conditions and natural resources and conditions. It is aimed at producing a citizenry which is knowledgeable concerning problems that affect our total environment, understanding how to be effective in helping to solve these problems, and is motivated to work toward their solution.

--- **Experiential education**: allows students to partake of learning activities, first-hand, such as learning about the forest in the forest, or about the economy at the bank or in the supermarket.

These definitions, that could come from any ordinary dictionary, represent the essence of my terminal project. I see a need for environmental education, and I now have the opportunity to explore the challenges involved with a site that has the potential of containing a working facility with an educational area.

The majority of my time involved in the final conclusions/solutions of my comprehensive project presentation related to these definitions and beliefs....

....beliefs of getting out of the classroom and into the environment to learn about the environment.
HANDLE WITH CARE

Responsible
I N T R O D U C T I O N

-----A Facility That Educates and Works-----

When all that flies in the leaden skies are airplanes
and all that swims are people in their chlorinated
concrete pools
When all that roams our valleys and our fields are
bulldozers
When our children climb on galvanized bars instead of
apple trees
and wear masks to breathe and goggles to protect
their eyes
we'll say, 'Why did we wait?'

When it's too late. —E. Jacob Tailor

This poem by Tailor is significant to me in its reality. If we do not educate people about the fragility of our Earth, then we will ask, "Why did we wait?" when its too late. Therefore, environmental awareness must start with education. We must be outdoors to learn about the outdoors.

QUESTION: Why have nearly 1000 new outdoor and environmental education programs emerged in the United States during the past two decades? To answer this question we must consider the sphere of resources that teachers use with their classes. In most cases, their educational programs are centered inside the classroom. With the exception of physical education, outdoor activities are infrequently
pursued.

Outdoor and environmental education programs are expanding at an unprecedented rate because of the obvious advantages of utilizing resources that are becoming increasingly available in locations other than the classroom (Gerston, pp. vi-9).

The expansion is still continuing in the industrial town of Pontiac, Michigan. It is in this town that a new and presently forming company called Compost Technology & Recycling, Inc. (C. T. R.) is planning on integrating education into their preliminary plans of the working compost facility. The President of the company is Dr. Craig Sawka, and he is serving as my minor advisor to this project. It is within the working facility that sits the educational facility. Thus, physically tying the two together where they both can enhance each other to create the reality....

....the reality of getting out of the classroom and into the environment to learn about the environment.

I have titled my comprehensive project F.E.W. which stands for a facility that educates and works. The abbreviation has a secondary meaning also. Even though they are expanding, there are few of them around per capita. Try to think of a couple of facilities like this one in surrounding communities close to your home town.

This facility is not intended to be a school in a wholistic sense, but rather a place where education is available to the public about the process that it incorporates within the site boundary lines of C. T. R.. Personally, I have a goal to successfully integrate the site, in design form, so that these issues and concerns of mine can be stirred up in the minds of the
visitors that come to the site. If it is a success, then even more issues will be thought of or brought up during their experience. Hopefully, this facility will help broaden their horizons of environmental consciousness.
The integration of a working facility involved with environmental issues combined with an educational program for visitors; the concept was born! But how did I arrive at this idea?

Throughout my educational experience at Ball State University in the undergraduate program for Landscape Architecture (L.A.), I have had classes associated with L.A., either required or as directed electives within the program, that have opened my eyes to the various issues concerning ecological soundness, environmental education, and environmental stability. Some of these classes include Environmental Geology, Self-Reliant Living, and Outdoor Recreational Planning.

I have also had the experience of working with Dr. Craig Sawka, the president of the newly forming C. T. R. business, while completing my internship requirement with Reinhold & Vidosh, Inc., a mega-landscape construction business also in Pontiac, Michigan. While Craig was pursuing his entreprenuerial endeavor and departing from Reinhold & Vidosh, I kept in contact with him. I knew deep down that his endeavor could possibly lead to a comprehensive project in which I could study. I was not sure as to what I wanted in a project at that time, but I thought of the possibilities. As time was narrowing down to decide on a project, I asked him if he would be interested in me working on an aspect of the facility that he felt needed further study. He responded immediately due to circumstances related to starting a business such as this one. He then sat down with me and wrote out about 7 topics that he would be interested in
seeing continued development on. We both decided that marketing was the place to start. So, I started heading toward a business like thesis. Obviously, this was going in the wrong direction. Within the programatic phase of this study, I was redirected by my professors and classmates toward a project that would be associated with my educational background.

With the combination of my strong feelings toward ecological soundness, environmental education, environmental stability and the relationship with Craig, the concept was born. The integration of a working facility involved with environmental issues combined with an educational program for visitors. The focus of my project will be the education involved with the process of composting landscape waste matter; specifically leaves, grasses, shrub and tree brush, tree limbs and trunks, and closely related vascular plant structures into a nutrient-rich compost that can be reintroduced into the community at various levels. I strongly feel that today's society needs to have a concept like this one implemented.

From here, I asked Craig to designate an area on the site in which I could study the feasibility of this facility. It was given to me. He allotted me to work with a 20' x 60' trailer and an outdoor area of 40' x 60' in which to design the educational facility. Thus, the entire facility had to be within an area of 60' x 60'. Space was limited on the site and I accepted the challenge.

It is from this point that I had to make some assumptions about my project.
ASSUMPTIONS

-----A. Facility That Educates and Works-----

My assumptions are basically simple, and thus they lead me into my terminal project without hindrance. I am assuming that the project is real, that it is going to be built as designed, zoning and ordinance laws would be permissible for development, and that the monies are available to carry the project through to completion as designed.

I am also assuming that the education happening within the facility will be in a guided tour-like setting for liability reasons. The tour will be scheduled in advance in accordance with climatic seasons, school terms, and Craig's wishes and/or public and private interests. The maximum use will be for 20 people not including the tour director/s. Compensations will be made for bigger groups. This is based upon the limited size of the site.

The user of the site will consist of 3 primary groups.

1) school pupils (grades 5-college)
2) public and private groups displaying interest
3) prospective clientele who may want to buy the product

From these assumptions, I had to develop some type of a program for the site and its context.
THE DESIGN CONCEPTS CAN BE GRAPHICALLY VISUALIZED AS A SET OF BUILDING BLOCKS THAT START AT SITE LEVEL AND BUILD UPON EACH OTHER THROUGH PROGRAMATIC PHASES. THESE PHASES DO NOT BECOME LESS IMPORTANT TO EACH OTHER AS THEY MOVE UP TO THE TOP, BUT EACH ONLY EXISTS BECAUSE OF THE LEVEL BELOW IT.
Site---The site is the base of the building block structure. This base supports the rest of the program's elements. For obvious reasons, nothing would exist without the site; the other elements could not exist. The site contains the outdoor educational experience, the working facility, the educational facility and the design criteria that exists within the educational facility.

Outdoor Educational Experience---This project is to provide an outdoor educational experience in a context that enhances the atmosphere for learning. Thus, the working facility and the educational facility are important elements that should be "built" on top of the outdoor educational experience level in the program model on page 11. At the time the visitors are learning about the benefits that composted materials have within the environment in the educational facility, the working compost facility is within sight of the same area. Thus, the two entities are interwoven. These entities are the main focus of the project and are important being together. The enhancement that occurs exists at the shared boundary of both facilities.

Working Facility---The working facility is the visual reinforcement of the educational facility. The educational facility is within the working facility context, and therefore, they both interact together. In one sense, the design of the working facility is influenced somewhat by the placement of the educational facility; the working facility is to operate around the educational facility and function as a separate entity.

Educational Facility---The placement of this facility has been agreed upon by the owner. The design of the educational facility is partially dependent upon the activities of the working facility. There must be an area within the educational facility in which the visitor can visually
interact with the working facility. This 'visual' area should be positioned in a place that is elevated above the landscape, and it should be in a location where maximum viewing of the working facility can be achieved. This part of the building block structure contains the design criteria.

**Design Criteria**---Within the design criteria exists a variety of educational experiences and a variety of plant and structural materials that are needed to design the site with an aesthetically attractive atmosphere; all of which are to help the user to get the best experience possible while being within the site.

The attractiveness of the site is important. The site should provide an abundance of natural resources and a varied topography to enrich the outdoor learning experience. A variety of things to look at/learn about would seem to be more interesting and stimulating. It should be located in a place where the users would "like to go anyway". Examples of desirable natural resources and attractions on a site include mixed timber types, varieties of plant and animal life native to the area, fields, hedgerows, ponds, streams, swamps, marshes, deserts, dunes, lakes, sea shores, hills and mountains. Of course, not all of these attractive features can be implemented, but this is the idea.

The attractiveness of the area depends also on the comforts the visitors can enjoy while there. There should be adequate shade. There should be a minimum of dust, and insect control measures may be necessary. These are helpful in the learning process, for they prevent such unnecessary distractions (U.S. Dept. of Agriculture, p. 6).
The site that I have had the chance to work with is located about 45 minutes North of Detroit in the city of Pontiac, Michigan. The nearest intersection of a major road is at the junction of I-75 and the Joslyn Road exit. The site is about 1 mile from there on Highwood Boulevard. The area of the site is established by property lines that surround 10 acres of land. This area will be illustrated further into this report.
SITE CONTEXT

---A Facility That Educates and Works---

--- Diagram ---

[Diagram showing labeled points A, B, C, D, E, F, and lines connecting them]
A---THE SCRAP YARD

To the North of the site exists a scrap yard that is very unsightly and will probably require some type of earth berm and plant material for a visual buffer. This yard extends the total North side of the property. Noise could be a problem here as big metal objects are being crushed and placed in piles.

B---NATURAL VEGETATION BUFFER

To the West of the site, there is a set of railroad tracks and a buffer zone of natural vegetation between the property line and the tracks. There are no real concerns in this area.

C---NATURAL VEGETATION BUFFER  (Area = 5.33 acres)

To the South of the site's property line exists a strip of natural growing vegetation that separates the property and a crushed concrete business. There are liability issues within this area though. A secondary entry/exit, used by both companies, is accessed by going through this area. The single, two-lane, dirt road enters from the East and eventually splits into two more two-lane roads which connect to the different properties to the North and the South respectively. An issue of dust control will have to be addressed from this area by the company.

D---PONTIAC CRUSHED CONCRETE

This business obtains scrap concrete from various construction firms, crushes the material into fine particles, and sells it back to the community for paving purposes. The noise is negligible because of the buffer area and the placement of their machinery at the South part of their site.
E--HIGHWOOD BOULEVARD

To the East of the site is Highwood Boulevard. This paved road will provide the main entry and exit point/s for the site. The road entering the site is already established at 80 to 90 feet North of the Southeast corner property line. This entrance is considered the primary access point.

F--PROJECT SITE (Area = 1.26 acres)

This area, in the Southeast corner of the 10 acre site, was determined by the conclusions found within my concepts. These concepts will be gone over later in this report. This area is to incorporate an existing 20' x 60' office trailer, the educational facility (a 60' x 60' allotted area including the trailer), the shared parking lot and landscaping of the office area and the educational area. Any pavement on this area is going to be paved to Highwood Boulevard.

It's only a matter of time.
S C H E M A T I C   D E S I G N

-----A Facility That Educates and Works-----
The schematic design on the previous page is intended to illustrate the general location of the various activities that will be going on at the site (shown as areas 1 to 8). It is also intended to illustrate the flow in which this site works (1 through 8), and how the site is accessed by the primary and secondary entry/exit points (points 1 and 8).

**POINT 1---PRIMARY ENTRANCE**
This entrance is used for yard waste drop off and employee/visitor entrance.

**AREA 2---DROP OFF AREA**
This is the area that the yard wastes from off site sources will be dumped for further processing. This material will then be moved to the product storage area.

**AREA 3---PRODUCT STORAGE AREA**
Heavy machinery will gather all of the yard wastes that was dumped off and gather it to this storage area. From here, the wastes will go to the processing area.

**AREA 4---PROCESSING AREA**
Heavy grinding machinery will break down the yard wastes including spent trees, shrubs, leaves, grass clippings, flowers, and spent soil. This process is an important step in the composting process in that it creates a larger surface area on the wastes. This allows for faster decomposition of the wastes. From here, the wastes go to another storage area.

**AREA 5---PROCESSING STORAGE AREA**
This area is set aside for the storage of the broken down wastes. The wastes are stored here for a short time before they can be put into
windrows.

AREA 6---WINDROWS
Windrows are long parallel piles of broken down wastes that get to be around 6 to 10 feet tall depending on the stage of decomposition. The organic decomposition of the wastes happens here. The wastes break down to a nutrient rich humus that can be used in a wide variety of landscaping/home gardening needs as compost.

AREA 7---PICK UP AREA
This is where the final product can be picked up and sold to the public.

POINT 8---SECONDARY ENTRANCE
This entrance is used for product pick up by public and private entities.

RETENTION POND
This area collects any run-off from the site. It is then used to keep the windrow piles moist. This aids in the decomposition processes as the water acts as a catalyst to the process.

EDUCATIONAL AREA
This is the area formulated from concept 3, that will be described later, to incorporate the facilities needed to develop the educational aspect of the site.
EDUCATIONAL AREA

SITE ANALYSIS

----A Facility That Educates and Works----

[Diagram of a site analysis plan with labeled points A, B, C, D, E, F, S, I, T, E]
SITE--THE WHOLE SITE  (Area including area F = 10.6 acres)

The site is relatively flat with a gentle grade moving downward to the Northwest corner of the site. The site is undeveloped at this stage, but preliminary plans have been drawn out for the physical layout of the working aspect of the site as shown in the schematic design. The final plan will include drop off areas, storage areas, processing areas, an office area with parking, pick-up and delivery areas, and an educational area. As of now, there only exists a 20' x 60' office trailer at the Southeast corner of the site with a 5 car parking lot to the North of it. Some rough grading has been done in accordance with the zoning regulations requiring that the site be visually buffered from the connecting sites and Highwood Boulevard.

F--THE EDUCATIONAL AREA  (Area = 1.26 acres)

Area 'F' sits within the context of the working facility on the North and West sides. The context, for the most part, has been previously covered, but it is necessary to understand what the context is that surrounds area 'F'. To the North of this particular area is proposed to be the drop off area and the product storage area. In this area, trucks will be dumping yard wastes into piles that will be moved by heavy machinery and stored in an area directly to the West of it.

To the West of this area is the processing area. This is the area that the yard wastes will be broken down into small pieces by heavy machinery. These areas are based on the preliminary plans for the working facility, but they are not existing presently. Both areas will produce dust and bearable noise. To the South is the natural vegetation buffer area, and to the East is Highwood Boulevard.
It is important for my reader and audience to understand that I am not designing the working facility and the educational facility. I am only going to be involved in the design of the educational area. The design of this area is somewhat dependent of its context; the working facility.
CONCEPTS

-----A - Facility That Educates and Works-----

Throughout my research and investigation, I kept in mind that the importance of experiencing the working facility, at least visually, was very important to the overall outdoor educational experience. This experience was also proposed to be one of the first experiences that the visitor was to have. The reasoning behind this is that the visitors could see where the sounds of the machines on site were coming from and they could understand how the site works before they went to the educational area. Thus, while in the educational area, they would be less distracted about the context around them. From this important understanding, I came up with 3 concepts.

CONCEPT 1

My first concept was simple in the fact that I wanted the visitors to first to take a guided tour through the working facility before getting to the educational facility.

To deny this concept was even easier because of the liability factor. My major and minor advisors, along with my classmates all agreed that this would not be a successful solution to the design.

CONCEPT 2

Concept 2 was based on the agreement of the preliminary placement of the educational facility by Craig and myself. The placement was proposed to be in the upper Northeast corner of the site, and the observation deck at the central part of the Southern property line (pg. 25).
After studying the placement of the facility up to midterm of my final semester, I had a list of 5 problems connected to concept 2.

1---LIMITED VISUAL EXPERIENCE

The visual experience was limited due to the form of the property. The property is long and narrow and the facility was placed in one of the corners of the site. Therefore, the comprehension of the site could not be achieved visually, and this negates a major importance of the experience that I wanted to accomplish.

ALTERNATIVE SOLUTION TO PROBLEM 1

The solution that I was trying to work with involved moving the viewing area to the central part of the Southern property line as shown in the illustration. This was done to allow the visitor a panoramic view of the working facility before going on to the educational facility.

2---CIRCULATION PROBLEMS

If this were to be the solution, then circulation would be a problem in two aspects.

A---DISTANCE

The distance from the proposed viewing area in relation to the educational facility was approximately 1100' along the Southern and Eastern property lines. The visitors would either have to first arrive at the viewing area by vehicle and then go to the educational facility, or arrive at the educational facility, go to the viewing area, and then back to the educational facility. This process would seem to be complicated and distracting to the visitors.

B---LIABILITY
A liability factor is involved with this solution. If the visitors were to arrive by vehicle at the viewing area, then they would have to go back out to Highwood Boulevard. They would have to cross the street to get in the right hand lane and turn left into the site again, all of which had to happen within 200' from the secondary entrance to the primary entrance. Try to imagine a car, let alone, a school bus trying to do this on a busy boulevard.

If the visitors were going to walk, there is a risk involved with vehicular traffic and unlevel ground that they might come across.

**ALTERNATIVE SOLUTION TO PROBLEM 2**

With the placement of these areas in the positions that I put them, I could not come up with a justified solution to the problems except to reconsider the layout of the facility.

**3---CONTEXT OF EDUCATIONAL FACILITY**

In this concept, the educational area has the scrap yard to the North of it. Therefore, there would be additional noise. Also the connection with the office trailer and the educational facility would be separated by the road entering the site from Highwood Boulevard.

**ALTERNATIVE SOLUTION TO PROBLEM 3**

A---Make the city of Pontiac readjust the zoning laws so that the scrap yard can no longer exist. This is not feasible.

B---Build a pedestrian bridge over the road. This would be expensive and not very functional, therefore no solution.

**4---WASTED SPACE**

Because of the context of the educational facility, there would have to be earth berming with plantings between the scrap yard and the facility. The separate parking lots also take up more room compared to
having a multi-use parking lot for the office and the facility. According to the schematic design of the working facility, this would cut into the space set aside for the drop off area for the yard wastes.

**ALTERNATIVE SOLUTION TO PROBLEM 4**

Somehow the observation area, the office trailer, the multi-use parking, and the educational facility has to be connected to solve this problem.

**5—PERSONAL FEELINGS**

I was reluctant to change the layout of these areas because of the reality of the project. I strongly felt that the placement of these allotted areas by Craig had to be followed. I thought that it had to be that way, and I wanted to try and make it work. This hindered me from developing new concepts and new solutions.

**ALTERNATIVE SOLUTION TO PROBLEM 5**

The solution was simple. I had to show Craig these problems stated above and ask him to reconsider the layout of the educational facility. The changes leading into concept 3 will allow the site to function with better success.

**CONCEPT 3**

The basic layout of concept 3 is illustrated on page 29.
This represents a design concept within area 'F' in the site analysis.
There are 4 basic advantages to this concept in comparison to concept 2.
1---BIGGER AREA TO WORK WITH

My site is not an observation deck and a 40' x 60' outdoor area any more. Combining the office trailer area and the educational facility allows me a bigger area in which to work in. This area 'F' is approximately 1.26 acres.

2---CONNECTIONS

The parking lots of the office trailer and the educational facility are now connected. This cuts the liability down significantly in relation to circulation. There is also a connection between the two areas. Therefore, the proximity to get from one trailer to another is more feasible. The distance between the two is now reduced to 210'.

3---CIRCULATION OF VISITORS

With this third concept, the visitors can arrive at the area that they need to be in without having to leave until their visit is completed.

4---NEW OBSERVATION AREA PLACEMENT

The viewing area is now placed at the Northwest corner of the educational area. This achieves my objective of allowing the visitor to visually experience the working facility. Not only do they have this experience, they are also within the boundaries of the educational area, and this alone cuts out the liability and circulation problems. The placement is not as ideal as that of the placement in concept 2, so I am proposing to elevate this area so that the visitors can look over the landscape. Visually, a 10 acre site is easy to comprehend from ground level as long as the topography warrants visibility. The comprehension would strengthen even more if one were elevated above the landscape. I have personally been to the site several times. On one occasion, I climbed to the top of a pile of asphalt left over from the demolition process. The
pile was about five feet tall. While on top of the pile I could see a clear view of the whole site. Thus, if the finished floor of the observation area is five feet or more, then the visibility needed would be sufficient even for younger people.

The combination of the overall site and program determinants brought me to a final solution that is illustrated in the educational area and master plan of the educational facility. The master plan of the educational facility is illustrated on the next page.
NOTE: I have broken the master plan down into a series of 5 educational tour functions (1-5) and 5 educational levels/experiences (A-E).
ABOUT THE EDUCATIONAL FACILITY

Again, the size of the educational facility was limited to a 60' x 60' area. This area is shown in the drawing on page 32 as the dashed line and the trailer walls. This size was established by Dr. Craig Sawka, the President of Compost Technology & Recycling, Inc., in which this area will exist. Dr. Sawka is also providing a 20' x 60' trailer that is included within the 60' x 60' area, therefore reducing the outdoor space to 40' x 60'.

The educational facility will be composed of five educational tour functions. These functions are illustrated in the drawing on the previous page (points 1 through 5).

1---ENTRY POINT:

The entry to the educational facility is located at point 1 on the drawing. It is bordered by a 2' dry laid stone retaining wall to the North and a 2' timber wall to the South. Both of these walls retain soil and the plantings shown in the drawing. The path is a coarse aggregate concrete material that visually connects the office trailer and this area. The path has relatively little grade change from the office to the educational
facility. Assume that the elevation at point 1 is 0'. From this point the grade of the coarse aggregate goes up at a uniform rate of 5.4% to the decking. At this point, the elevation is .81'. From here, the slope stays the same and reaches a flat area at an elevation of 1.3'. This flat area is at the Northeast corner of the 40' x 60' site. The finished floor of the deck is proposed to be 1.75' (or 21''). So, the elevation change from the flat area to the deck goes up 5.4% from 1.3' to the finished floor. This is all designed to accommodate for easy wheelchair access. The maximum slope for handicap ramps is around 8.0%-8.3%.

The numbers are relevant in that the entry to the trailer exists at 1.75' (or 21'') above the ground, and I wanted the deck to be at an even level with the trailer's entry point for easy handicap access and to eliminate steps at this point.

2---OBSERVATION DECK

Access to the observation deck is indicated at point 2 on the drawing. The basic layout of the deck is illustrated on the educational area illustration on page 29. The elevation at point 2 is 1.75'. From here, the slope goes up at a constant rate of 6.0% to a flat area where the ramp
changes direction. At this point the elevation is 2.48'. Again, the slope remains a constant 6.0% from this area to the observation deck. The observation deck's finished floor is proposed to be 5.0'. The earth berm that surrounds the educational facility ranges from 3' to 5', therefore construction problems would be minimal concerning post sizes for the deck.

The observation deck is proposed to be the first area to be visited within the educational tour process. At this area, the visitors can visually comprehend the scale of the working facility and understand the context in which they are in. The visitor could get a broad view of the landscape and of the whole site. One could see the big machinery, smell the smells and get a basic understanding of the whole site. In this manner, questions will start to churn, and the visitor will be less distracted later because they have seen where the sounds, smells etc. are coming from. The basic idea at this area then, is to provide the visitor with the partial answers to their questions before their questions come up. Or in other words, to trigger their thought process.

3---EDUCATIONAL TRAILER
After visiting the observation deck, the visitors next experience is provided within the educational trailer by their tour guide. This area is identified as point 3 on the drawing. In the trailer, they will see a small film or a combination of film and slides that reinforces what they have just seen, but to a higher degree. For instance, they will learn about the site; the origin of the yard wastes, the machinery and their uses, how the site functions, what the site produces and how it produces the product. They will learn about the uses for the product and its distribution areas. Finally, they will learn about the work loads and scheduling of the working site. This experience is to provide a basic understanding of the working facility. There will also be time for discussion if any of the visitors have any comments or questions concerning something that was not covered.

4---TOUR OF EDUCATIONAL FACILITY

The tour of the educational facility begins at point 4 on the drawing. The tour runs through various stopping points starting at level/experience A and going to level/experience E in progressive order. The elevation at this point is 1.75'; the finished floor of the deck. The deck ramp then
proceeds down at a constant slope of 5.5% to a flat area where the ramp changes direction. At this point the finished floor elevation is .66'. From here, the slope changes to 2.1%, and the coarse aggregate finished floor elevation is at .5', assuming that the starting elevation of 0' is at point 1.

My main concept with the educational tour is that the visitor is educated a little in a broad sense, instead of being educated a lot in one particular area (such as the machinery needed, etc.) In this way, hopefully their educational experience will be broad and stimulating. The challenge now is to design the areas involved to best achieve this.

The tour is based on a learning scheme starting at a broad level(A) and moving toward a more specific comprehension(E). This concept will be discussed later.

5---FINAL DISCUSSION AND REFRESHMENTS

Point 5 on the drawing would function as the area for final discussion and refreshments supplied by the company. This function will take place after the visitors finish their tour (A-E).

The educational levels/experiences will start at point 'A', which
illustrates a broad understanding of the process of composting, and move through a maze type walk-through program to point 'E' which illustrates a more specific and technological level/educational experience. At these different levels would be a variety of displays from graphs to hands-on types; all of which help them to understand more about what the whole concept is.

In some cases I have found that some of these points overlap in some way. Therefore, a display, might incorporate 2 or 3 points that are closely related.

It was a challenge to me in that I had to determine what the visitor might be interested in or would want to know about the many aspects associated with yard waste composting before they even would arrive at the site. An important part of choosing these levels of interest came to me by just asking people what they would like to know or learn at a site like this. After telling them the basics about the project's program, they came up with some quick questions such as:

"What is the breakdown ratio from raw waste to the final composted material?"

"What are the dangers in composting materials that contain pathogenic substances, herbicides or pesticides?"

"How can a business like this make money?"

"Where do the wastes come from?"

"Does the compost smell?"

"What kind of machinery is required for this type of industry?"

"How does the machinery work?"

The list can go on forever, but the important part is that I have looked at these questions, and I have tried to tie them in together some-
how so that the educational tour can help answer as many questions at the educational facility that are raised.

A---THE WOODEN BIN

At level 'A' is a wooden bin divided into three sections. The first section would be full of yard wastes, pieces of spent trees, shrubs, grass clippings, leaves, flowers and soil as it would be seen coming into the site. The second section would contain the same amount of waste, but it would be displayed as processed waste which is basically the wastes in section 1 broken down into smaller pieces by the machinery. Finally, the third section would contain the same proportion of waste, but this would be the final product of the waste after composting. Here, the visitors could see the effects of the breakdown process, feel and smell the material as it sits, and how this working facility could have a dramatic effect on landfill relief.
At level 'B' is a graphic display, attached to the side of the trailer at eye level, of the benefits that composted yard wastes could provide to the environment. For instance, the breakdown ratio of raw waste to a composted material is 5:1. This would reinforce what they saw at level 'A'. Perhaps the visitors have the opportunity to study soil formation, soil texture, acidity and water absorption through various media as an educational display (Eldridge, p.16). A cross section of two soil profiles could also display the effects of adding compost to areas in a new landscape compared to not doing so. This would compare the growth rates of plants relating to the addition of compost. This area could also display the technique of reintroducing nutrients into the soils of degraded landscapes and how this technique can be economical to a client in the long run.
C---THE CHANGING AREA

At level 'C' is an area that I will call the "changing" area. For example, this area could be used for updating facts, figures and case studies that are happening around the nation. It could be set up according to states in a rolodex type display, and it would be updated accordingly to help the visitors see how vast this process is becoming, what new technology is being used for different environmental concerns, and new areas of ecological awareness that are becoming of interest.

D---THE BACKYARD COMPOST DISPLAY
At 'D' is a backyard compost display area. This area is to replicate a piece of a typical backyard, as if it were picked up somewhere by a helicopter and placed on this area. It includes a 4' x 4' x 3.5' compost bin, a 6' privacy fence, a shade tree, ground cover, metal edging and a sodded area. The aesthetics of this area is to portray a backyard feeling. Here, the visitors could learn how to construct a compost bin if they were interested in doing some composting of their own at home. "How to compost" brochures could be made available to the visitors that would show them how to build it and how to maintain an efficient compost pile for their own use.

E---THE TECHNICAL AREA

At 'E' is the technical area. Within this area, the visitors would learn facts and figures about the various concerns that society has in connection with setting up a commercial compost facility. The attitude that most people have toward a facility like this is abbreviated to make a word. The word is N.I.M.B.Y., and it stands for "Not In My Back Yard". This attitude stems from past actions of local authorities around the world that have made bad decisions with nuclear power plants, chemical and
hazardous waste landfills and the such that have become disastrous to surrounding communities in some way or the other. Even trying to set up a facility like this one brought up similar concerns that created resistance within the community. Therefore, area 'E' will be set up to confront the issues that some people might be concerned about. It will also show how the decomposition process works, how pesticides, herbicides, and other pathogens are broken down within the process.

This level marks the end of the educational tour. The visitors will then gather at area 5 for the final function as stated previously. Hopefully, after the tour, they will come up with other questions that they wouldn't have otherwise.

Because of Craig's relationship with Reinhold & Vidosh, a mega-landscape construction company, seedlings of various native trees could be given to accepting visitors at the conclusion of the educational experience. This idea is based upon the life cycle of the plant. They could "adopt a plant", take it to a home (a place to plant it), and watch it grow; all with the understanding in mind that this tree takes nutrients from the ground while growing and that when it dies or has fallen, the nutrients that it has accumulated over its life span can be reintroduced into the soil.

There are two basic feelings that I want the visitors to leave with. One is to become sensitive to the "total environment": observing everything around them, people as well as things, that they become responsive to the beauty and utility of the man-made as well as the natural surroundings. The second is to be concerned with the "natural environment": understanding natural processes well enough to deal with man's impact upon them, preserving examples of wilderness, optimum
management of natural resources, etc. (Tanner, p.27).

The combination of unlimited ideas and educational experiences like these will provide the visitor with a better understanding of environmental awareness that the project is trying to convey.
SITE DETAIL

--- A Facility That Educates and Works ---
CASE STUDIES

---A Facility That Educates and Works-----

1---The City of Urbana's 11,000 street trees and an estimated 44,000 private trees are considered to be among its greatest assets. Urbana's commitment to nurturing its urban forest has earned this east central Illinois community 13 Tree City USA awards and the respect of the municipal forest industry.

However, that commitment to urban forestation and beautification is not without its problems. Each year the community generates some 3,600 tons (15,600 cubic yards) of landscape waste from public and private sources.

The landscape waste generated in Urbana represents approximately 18% of the total waste stream and as much as 35% of the residential waste stream during the growing season. Nationally, landscape waste accounts for one of the largest single components of solid waste we generate. In most communities, it is simply landfilled along with residential, commercial, and industrial wastes. Throughout Illinois, until very recently 95% of all solid waste was landfilled, with only 2% being recycled and 3% being incinerated with or without energy recapture.

However, Urbana is unique, in that it is approaching a 50% recovery rate of landscape waste and is returning it to the community as a useful product.

In the early 1970's, Urbana began composting its municipally collected leaves and made wood from its municipal tree removals
available to the public. But with a growing concern for diminishing landfill space and the corresponding rise in disposal costs, the City began to explore other disposal techniques that would capture a larger percentage of all the landscape waste being generated.

In 1986, the City opened the Regional Yard Waste Reclamation Facility by intergovernmental agreement with its neighboring municipality, Champaign, and the surrounding county. The reclamation facility processes all privately and publicly generated landscape waste from its service population of 172,000.

Located on a retired 20-acre section of the Urbana Municipal Landfill, the facility is operated as a division of the Public Works Department. This service area generates 11,400 tons (50,900 cubic yards) of landscape waste per year.

Materials are received at the site for a tipping fee of $4.50 per cubic yard, regardless of the source. They are segregated by the truckload into succulents (leaves and grass clippings); brush and cuttings; and heavy woods (in excess of 6" diameter). All material must be free of foreign material such as metals, plastics, refuse, and the like. Site crews observe the dumping of each and every load, so as not to accept mixed loads.

The succulents are windrowed and composted into a gardening mulch that is sold to commercial landscapers, municipalities, and private parties for $3 per cubic yard. Windrows are approximately 300 feet in length, six feet in height, and 12 feet in width, so that they can be shredded and turned by a Wildcat compost turner.

The shredding action and the constant introduction of air keeps the compost process aerobic, and consequently there is little if any odor. The
processing time, which is governed by the frequency of turning, is a maximum of one year, so as to provide a complete turnover of the area between leaf seasons.

The brush and cuttings received at the site are ground into wood chips, which are sold for $4 per cubic yard for ornamental landscaping applications. The material is ground in bulk in a WHO Tub Grinder at a rate of 15 tons per hour.

The grinder was originally purchased for $125,000 in 1987 and is in use 25-35% of the time, depending on quantities of material received. Loaded by a 90-horsepower crawler tractor outfitted with logging grapples, the unit generates a wood chip that reduces the brush volume by 80%.

In that the tub grinder is limited to receiving material smaller than 6" diameter, all larger woods, "heavy woods", are segregated for processing into firewood. Wood is stockpiled in windrows and made available to commercial operators and the public for on-site cutting and splitting at no cost.

To the extent that the City can obtain state and federally funded labor, convicted individuals having to serve community time, or surplus labor, it cuts and splits firewood and sells it at or below market rates.

The reclamation facility operates on an annual budget of $190,000 and employs 2.8 full-time equivalent persons operating six days a week all year. In fiscal year 1988-89, the first year a financing structure was set up, the facility had an annual budget of $144,700. It received $60,000 in tipping fee revenues and material resale. The shortfall of $84,700 was shared equally by the Cities of Urbana and Champaign, and Champaign County. Not included in the economic analysis, however, was the avoided
cost of landfilling this material, amounting to some $66,000 a year.

The original pricing at the facility, which began with a tipping fee of $2 per cubic yard, was structured to increase to the current $4.50 per cubic yard so that by 1990 the municipal subsidy would no longer be necessary and the operation would be self-supporting. The subsidy period, as reflected in the lower tipping fee, was created to allow an opportunity for the operation and concept to become institutionalized within the community and, in particular, the landscaping industry.

Urbana not only operates a unique regional landscape waste reclamation facility, but also offers a landscape waste collection service to the community. Beginning in the fall of 1988, the City expanded its existing traditional curbside recycling program to include landscape waste.

Landscape waste generators can purchase degradable plastic bags known as U-bags, and natural fiber brush ties called U-ties, at local retail outlets and set them at the curb for collection by the City. The price of the bags (50 cents each) and the ties ($2.49 each) includes the cost of collection, the tipping fee at the Regional Yard Waste Reclamation Facility, and their manufacturing costs.

This program was created to assign the cost of collecting and disposing of a particular waste to the generator on a volume basis. To date, the program has been well received. Some 750 cubic yards per year (compacted) of landscaped waste have been collected seperately in Urbana at the curb and ultimately reintroduced into the landscaping industry as a useful product.

This regional facility and our unique collection program constitute an innovative approach to solving what is quickly becoming a major
concern of communities across the country. By creating a closed cycle of
growth, reclamation, and reuse, the Illinois community has successfully
addressed a large portion of its urban waste dilemma.

This effort did not come too soon, in that the State of Illinois
banned all landscape waste from landfilling, effective July 1, 1990. This
legislative action acknowledged the tremendous impact of landscape
waste on our solid waste dilemma, and the availability of disposal options
such as those under way in Champaign County (Darling, pp. 26-30).

CONCLUSION---This article is educational reading. The effort in
Champaign County is real, but one does not physically see it
happening, unless one were to live there. The facility in Pontiac
allows people in the surrounding community to come to the site and
see the process of composting at an industrial level and learn about
it in a more personal atmosphere. F. E. W. offers the community
education.

2---Save cash-use trash! Some California gardening fanatics proved the
point that almost anything can be used for gardening. Imagination is the
key word when it comes to saving money by using cast-off materials. A
group that is high on enthusiasm, but low on budget, can make ends meet
through creative scrounging. Trash can be substituted for cash! (Sommers,
pp.125-126). In this book, there are listed items from wire cable spools
to gym lockers that are being used in gardens across the country.

CONCLUSION---The point here is that people, at a local scale, need
to realize that wastes as we know them should be thought of as a
resource. For example; field rocks might be considered useless to a
corn farmer, but a valuable asset to a landscape company.
Of course, not all waste can be considered as a resource, but this is the point.

3---A major headache for large metropolitan areas is the management of the tons of solid waste produced each year by residents. The most widely-used system for coping with these piles of garbage is to bury them in a central sanitary landfill. But so much waste is being produced that it is starting to overwhelm many cities. More than half of the nation's metropolitan areas will have failed their sanitary landfills by the year 1982, and it is becoming practically impossible to get public support for new landfill sites in any existing neighborhoods.

A solution to this problem has been demonstrated repeatedly on a small scale: source separation of recyclables from garbage. About 58% of what people throw away consists of metal cans, glass containers, and fibers such as newspaper and cardboard; all of which can be very valuable as raw materials. The remainder of the waste stream includes a large amount of foodstuff, which can be made into a precious soil conditioner as petrochemical-based fertilizers become exceedingly expensive. The remainder of the garbage is just that; irreducible garbage. But the value of the saleable portion is forcing urban areas to examine whether they should be paying to bury materials they should be selling, such as metals at $600 to $900 per ton.

For these and other reasons, source separation is going big scale. Pilot projects are under way to reclaim every possible pound of metal, glass, fibers and organic waste generated by entire cities. Instead of one large garbage can, neighborhood residents are provided a can and several smaller buckets. A typical municipal system would pick up the garbage can once a week, and pick up a bucket of metals, glass or fibers once or...
twice a month (Britz, pp. 208-209).

**CONCLUSION**—Programs such as this are popping up throughout the nation. Why? I do not think it should be a question, rather an understanding of the environmental need of such programs.
CONCLUSIONS

-----A - Facility That Educates and Works-----

I want the visitor to leave this site with a sense of hope for the future. In today's society, it seems that the problems facing us are so extensive that we feel hopeless concerning solving any of the problems. Today's philosophy, as I see it is that people want the "experts to handle it". Their feelings are that they can't solve the problems by themselves because of today's global view of environmental problems. This project is aimed at directing feelings. Feelings to be taken away from the project site that encourages people to get involved whether it is individual or community based.

As the positive feelings toward the out-of-doors and the world of nature are brought together to enhance the experiences of the visitor, it is my hope that the ecological health of these visitors is nourished.

When all that flies in the leaden skies are airplanes
and all that swims are people in their chlorinated
concrete pools

When all that roams our valleys and our fields are
bulldozers

When our children climb on galvanized bars instead of
apple trees
and wear masks to breathe and goggles to protect
their eyes
we'll say, 'Why did we wait?'

When it's too late.

- E. Jacob Tailor
DISCUSSIONS AFTER VERBAL PRESENTATION

----A Facility That Educates and Works-----

THIS SECTION OF THE WRITTEN PROJECT WAS CREATED SO THAT THE READER OF THIS REPORT CAN HAVE KNOWLEDGE AS TO WHAT COMMENTS AND QUESTIONS WERE BROUGHT UP AFTER THE CONCLUSION AND SUMMARY PART OF MY VERBAL PRESENTATION. I HAD A TIME FRAME IN WHICH TO PRESENT, THEREFORE THE COMMENTS, QUESTIONS, REBUTTALS AND ANSWERS WERE LIMITED. THESE QUOTES ARE NOT VERBATIM, BUT THEY ARE AS CLOSE TO THE ORIGINAL QUOTES AS I CAN RECALL.

1. COMMENT---I think that by physically connecting the office trailer and the educational facility by the coarse aggregate concrete pavement is a liability that you were trying to avoid. To me it reads as a side walk, but its in the middle of the vehicular traffic.

REBUTTAL---The coarse aggregate concrete has the design function of visually connecting the office area to the educational facility. The concrete is used primarily as a walk for the office at the office area, but getting to the educational facility from the office is open to the individual. The concrete in the parking area is surrounded by asphalt pavement, and their ground levels stay the same. There is no difference in the vertical plane, but the horizontal plane is manipulated through materials.

A set of stairs in a building tells you where to go and how you will
get there. The architect of that building is controlling pedestrian circulation. This does not do that. It just visually connects the two areas. There is no rule on the site that prohibits you from walking on the asphalt, in the grass, etc.

I believe that the liability is still avoided. This facility is set up for an educational experience. In my assumptions I said that the tour will be scheduled in advance in accordance with climatic seasons, school terms, and Craig's wishes and/or public and private interests. The maximum use will be for 20 people not including the tour director/s. I envision people coming to a site like this one as a group or at designated time, either by bus or by car pooling. Therefore, vehicular traffic will be the most intense within a short time frame. This along with the fact that this area serves primarily as a parking lot gives me reason to believe that vehicular traffic is going to be slow and under control.

2. COMMENT---If everyone was educated about this process and its benefits, and built a compost bin in their backyard like the one in education level 'D' in your master plan, then this working facility would fail to exist due to economic circumstances. There would not be anything to compost.

REBUTTAL---This is a good observation. But it is wrong. The situation that you are bringing up is very idealistic, so let me use this scenario in my response.

Even if everyone composted at home, there would still be forest reservations, public and private parks, and natural disasters such as the ice storm that hit us a few weeks ago that produced an unbelievable amount of yard wastes. All of these places/events and maybe some more,
produce a large amount of wastes. For example, the people composting at home probably will not rush out to Prairie Creek Reservoir to clean up the fall leaves or all the broken branches and fallen trees after a storm. Area 'D' is a display of a family use system that could take care of some of the yard wastes on their property; and that is great if everyone were doing that. But, the need for a industrial type composting facility will continue in the long run.

Remember the case study about Champaign? The State of Illinois is banning all landscape waste from landfilling, effective July 1, 1990. This legislative action acknowledged the tremendous impact of landscape waste on our solid waste dilemma. There are a lot of state governments now considering passing this type of legislation. If this happens in a community, just think about the wastes generated from one landscape maintenance company that maintains a lot of commercial landscapes. They can't bury the waste any more. It has to go somewhere. I believe that facilities like these, at least the working part, will be expanding at a rate that is directly proportional to the passing of legislation in states around the nation like that in Champaign.

3. COMMENT---I can't see an overall plan for environmental education within a commercial atmosphere. This project should be thrown out the door. The education of environmental stability is strongly contradicted in this setting by the use of fossil fuel burning machines that do 90% of the work. How can you justify the project?

REBUTTAL---The essence of this project is to think globally and to act locally. Try to think of the working facility as an answer to the global problem of accumulating yard wastes brought on by the legislation actions
previously stated. The educational facility within this "globe" is to educate the public on a local level so that they may have a better understanding of their potential effects, positive and/or negative, within the global context.

A solution to eliminate the fossil fuel burning machines would be to hire people, a lot of people, to break down such wastes as spent tree trunks and tree limbs into smaller pieces so as to speed up the decomposition process. Because the working facility is a business, this would not be feasible. Just think of the payroll that Craig would have to compensate for. Besides that, the turnover rate from the wastes entering the site to leaving the site would increase significantly. Thus the total income would also decrease significantly.

Another solution to eliminate the burning of fossil fuels would be to convert the machines so that they can run off of methane which would be produced by animal wastes. This would involve a whole other comprehensive project.

Within the context of my research, I have come across numbers associated with the amount of yard wastes produced in an "ordinary" community. The seasonal amount is very large, and with the legislation that I have been referring to, these numbers are going to be even higher. There is an issue of 'give-and-take' here. Industrial type recycling programs such as C. T. R. will be needed to compensate for these amounts of yard wastes that are produced in community settings.

4. QUESTION—Ear you talked about the turnover rate of composting yard wastes. Could you elaborate on that some more?

ANSWER---The turnover rate is the time from when the yard wastes
come into the site to the time at which the wastes are decomposed to be sent out into the surrounding areas for further uses. The time associated with this process is a minimum of one year.

5. QUESTION---What happens at this site in the winter months?
ANSWER---The educational and working functions would still continue.

Schools are in session at this time, and students could still learn about the process of composting, but at a smaller scale. Most of the educational aspects would have to take place within the educational trailer because of the climatic conditions. The conditions would also hinder the experience that I was trying to allow the visitors to achieve. They might not be able to see the working facility working as it would be in milder climate situations. To compensate for this, they will see a small film or a combination of film and slides that helps them understand what actually happens at the site at peak season.

The working facility would still be in operation. The decompositional processes are still happening in the compost piles. Only on very harsh days will the operation be brought to a near standstill.
B I B L I O G R A P H Y

----A Facility That Educates and Works----


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