



American Speech - Language - Hearing Association

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AtSite Real Estate

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Technical Report 3

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## *Executive Summary*

Technical three allows us as students to analyze and understand the industry and how we affect it everyday. The PACE roundtable was an opportunity for all of us to learn at greater length those topics that are currently essential to the industry. These topics included green materials, BIM models, as well as industry respect to sub-contractors. These topics and discussions greatly affected my topics throughout my thesis and the analysis I plan to conduct.

My critical issues analysis concentrates directly on LEED rated buildings and their affect on our industry. How important is it to have a LEED rating, why are owners in the industry simply attaining sustainable designs without LEED and want buildings to remain green? LEED began as simple awareness and morphed into the rating system it has become today. Although, green and sustainability are becoming highly important to the construction industry many contractors and some owners do not like the LEED system. The rating system has been described as flawed and can become too complex or complicated. Therefore it is my interest to understand what is important for sustainable buildings and if another system can be devised or how the old system can be corrected.

Although the ASHA has not faced schedule or cost concerns yet it is attempting a LEED silver rating. Following my critical analysis I am interested to determine whether or not it is possible to have the building remain sustainable along the lines of the new system while lowering up front costs as well as having long term energy costs remain low. The structural system is also a mixed system in which there was a concern about the lead time on the steel used, however because permits took so long to be obtained it became a non-issue therefore it is my interest to redesign the steel with a C.I.P. system that can allow for the same LEED rating or at least allow the building to remain “sustainable” while lowering cost and possibly schedule time. The mechanical unit can also be analyzed. While it remains complex and high in initial cost the long term savings and LEED rating are where the majority of the money is spent. Therefore I hope to change the system while hoping to lower the up front cost and keep long term cost low helping with sustainability and hopefully allowing LEED silver to still be reached. The ASHA because it was a non-profit organization had the building remain design-bid-build. The schedule is highly important to this project and I hope to re-analyze the schedule as a design build project to determine how much time could be saved and overall costs under the same initial design.

## *Critical Industry Issues*

### *Green Building Materials:*

Green Building design is becoming a very important aspect to buildings and building design. As owners become more educated and interested in green design and its benefits it is becoming essential for the construction industry to become educated as well. The panel spoke on many levels of importance from materials procurement and what LEED does for a building.

The keys to construction most importantly include geo-thermal design for energy efficiencies as well as recycled materials, local materials, and other simple requirements like VOC levels can be simple ways to improve one buildings LEED rating. Another key is the education of the owners and making them understand what LEED rating is and how it can be reached.

Through the discussion of procurement there was a realization that due to the increase in the popularity of LEED rating that the number of LEED materials and carriers has greatly increased. This means that the ability to attain and manage green materials has become much easier. It was also mentioned that an owner could be “in bed” with a specific distributor which could impact costs of materials and of the overall project which would cause an unfair advantage for specific companies.

Green ideas must also be carried down to sub-contractors. This can be extremely difficult to do simply because many subs have specific ways of handling materials and completing jobs. Meaning on a LEED project they must be watched very closely to make sure things are being completed properly and according to code. It may take some time to relay the importance of green materials to subs and to have them do it properly but it is a step that must be taken.

What makes LEED so important? Although LEED was originally used for awareness of sustainability and green design it has slowly become the rating system for design. However, many building owners are attaining green buildings without the use of LEED. Instead, owners are simply using green materials and are designing for sustainability, but do not attempt to attain an actual rating. Therefore, what is the future of LEED? It is shocking that even with the popularity of LEED increasing allowing for more distributors and options that some firms are turning away from LEED unless they simply want the title for their building. In the future some people in the industry were unsure if LEED will even still remain or if buildings will become green and sustainable as owners implement personal rating systems rather than LEED.

The ASHA is attempting a silver LEED rating. It is interesting to determine how and if the attempt at the LEED rating has affected the schedule or cost. Also finding out why they are attempting a LEED rating as a non-profit organization is also interesting. Is it simply a reason to impress and would they have been better off simply remaining sustainable and green but avoiding the “hassle” of a LEED rating.

LEED is slowly becoming more and more popular helping procurement of materials, the amount of carriers, and an overall understanding of LEED. However, with the knowledge is also coming change. Firms see the importance of sustainability and green but due to the difficulty of the rating system and the overall importance to the building many owners are passing on LEED, but remaining green and sustainable. There

fore the future of LEED may again become more about awareness so long as owners remain interested in a green industry.

### *BIM: Model Development and Responsibilities:*

BIM models are the AutoCAD of the future. Scary at first with those in the industry still uneducated and unsure of BIM and the capabilities that could highly impact the future of the industry. BIM models look promising however it is going to take time and understanding in our industry today to have them move to the forefront of the industry.

Who will be the individuals to bring it into the industry? Will it be designers, design-build firms, general contractors or will BIM open the doors for a new industry that will work solely on BIM design. Most believe that BIM must start with the designers. Once designers begin to give a base model for the other industries to work off of and analyze BIM will have the opportunity to grow. However, it is highly difficult to convert architects and other designer over from models they have been using their entire careers.

Although hit should begin with designers there as a consensus that it will start with the government. The government will and have been attempting to “push” BIM modeling on the industry by creating requirements for modeling on projects and using it themselves. The government will have to set the standard and allow for growth to occur once that standard has been set.

But if all of this is going to begin with the government and designers when does the construction industry take over and begin to use BIM modeling. The consensus was that in a design-build firm or with a firm that does most of its work in house BIM models will begin and only grow from there. The question arose about straight bids and when would a GC or CM be able to get the model and how communication would have an impact. Communication will be essential between our industry and the designers, because although the “communicate” now, with new technology and so much being able to be done with these models the work between designers and the construction world will grow.

It was even brought up that if the modeling was done early enough and given to the firms they may be able to use the program not only for scheduling, walk throughs, and conflicts, but even for bidding. The ability to construct the building and analyze the materials used could essentially help with a “quick” bid.

Once a model is developed it was discussed who should maintain the model. It was believed that the GC should follow through on the model all of the way through as-builts and make the necessary adjustments. Then it would be up to the owner to continue with the program and use it in the future. There was a suggestion of using the modeling to help with a maintenance model that could be used by the owner in the future. It would be the ability to sue the modeling through the life of the building to help with its maintenance and replacements to keep the building functional for as long as possible.

BIM modeling will have its fair share of liabilities however. With the ability to sequence a job and see conflicts before they occur could cause some unrealistic expectations. The expectations of the owner could easily become that the job will be done on time, with no conflicts, and no change orders. Although the modeling will help these issues and concerns there is no way to eliminate all of these problems. This may

cause new general liability and E and O concerns. If there is a conflict who is to blame and why, would it be the modeler, the mechanical sub, or if there are delays on the job who will be blamed? So although these models will be helpful they could also cause new concerns.

All of these opportunities could form a whole new branch of the industry. Firms could be created that simply take drawings and schedules and coordinate the entire project in a BIM model. It may start something new that may be highly beneficial. These firms would solely worry about the coordination of schedule and would be a check for the industry. Not only would they help firms with coordination, but they would also help with software difficulties. There would be no concern of multiple programs instead it would all be done under one program with one firm.

BIM modeling presents many opportunities, the ASHA did not use this modeling however. It is interesting to see why they didn't and also as construction continues on site how many change orders will come in and how many conflicts may occur, that could have been avoided by using a BIM model. BIM modeling is the future however it is going to take time and the education of the industry for it to be used to its maximum capabilities.

### *Building Respect with Specialty Contractors:*

Specialty contractors are essential to every job. Maintaining a good relationship with these contractors is necessary. It is important on both sides to understand each others needs and attempt to have the work feel like a partnership not a dictatorship because everyone on a project is on that project to make money.

There are many situations that can greatly affect these relationships for both the positive and the negative. In order to build these relationships there are a few but essential roles that must be played. First everyone should enter the project having the overall policy that everyone is going to make money. No one should start a project with the mind set to ruin other people's work. GCs should not be taking advantage of subs by nickel and dimming them or looking to cut corners to cut some subs work. Likewise, subs should not look for every change order or look to run prices up or delay the project.

The true key to any project is honesty, and living up to what is said is going to be done. If a sub says they are going to get something done then they should do their best to keep their word. However, if for some reason they are unable to complete the work on time or on budget they should be honest with the GC that way a compromise can be reached rather than having large on site problems. Another important aspect as a GC is to have a firm but fair approach. It is important to get to know your subs on a somewhat personal level but not to become too friendly, or be the other side of the card and be too strict. If a GC is too soft more often than not subs will take advantage of them, or jealousy on the job site between subs may occur causing more problems. However, if a GC is too strict and writes the sub up for every small detail the subs may unite together against the GC and still get the job done, but in the future do not look to get work from those subs.

Even something as small as a thank you note at the end of the job can keep a good relationship going strong with companies. Email is over used and is looked as not being genuine or personal. It is important to keep those person to person contacts and

relationships and there is no better way to do that than by a personal letter or a phone call. It is a small act but is greatly appreciated.

Keeping a good relationship is essential especially when subs need work or a GC is in a bind and needs some help. By keeping healthy relationships most project problems can be resolved.

Unfortunately, in the construction industry it is much easier to erode relationships rather than build them. The easiest way to ruin that relationship is by being dishonest. Telling a GC things will be completed or done on time and then not being able to fulfill that lie can be a serious concern. A big problem for subs in the industry is being contacted to help bring the cost of the project down with new ideas and then having the GC shop the job out to other firms as their own idea. This basically ruins a relationship because a sub was simply used for information and ideas and then cast aside.

Respect of each others boundaries is also highly important. Subs absolutely hate it when a GC will ask for ideas and suggestions and then just throw the ideas out, or even worse when a GC refuses to ask for suggestions. Most subs feel they are masters of their craft and can help with the cost and efficiency of a job if they were only asked. However, subs can also have a tendency to overstep their bounds. It is the GC's final decision and therefore even if the sub does not like the way things are being done they can't simply explode they must get the work done that was requested and designed.

Trade to trade respect is also important. The on site "chemistry" can greatly affect a job. A lot of subs will only work with specific individuals from companies do to their "chemistry" as a team. If subs have a problem with one another it can lead to many problems from delays to destroyed work and finally an overall increase in the project cost. If subs are having problems with each other a lot of times getting them to talk or yell it out at one another and compromise can generally solve the problem and work can continue.

Relationships are essential in all aspects of construction and will lead to a jobs overall success or failure. The ASHA is a very simply office building however the subs relationships are important due to their affects on the schedule. The ASHA is already paying rent for their former building while the new office complex is being completed. Therefore, there should possibly be incentives for the subs to complete their work early or under the expected budget since that will save the ASHA money on not only the job but rent. Relationships are essential and can bring a project to a halt or keep them going even through the toughest of problems.

### **Contacts:**

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## ***Critical Issues Research Method***

Green buildings have grown continuously in popularity within our industry today. However, the question remains how beneficial is a LEED rating to a building. It was discussed in the S:Pace roundtable that many owners are abandoning a LEED but, remaining with the belief in green buildings and reusability. Some owners have even begun to use their own rating systems for sustainable design. The owner simply determines what works in their area, what is cost effective, and how much it may save in the long run and then uses those green attributes on all of their buildings. Therefore, the question is what is a LEED rating really giving to a building besides a name, and would it be better to simply set goals for sustainable design by individual owners, or is a rating system necessary.

The industry is highly interested in green buildings and this research would not only interest those intrigued by a LEED rating, but also all owners interested in sustainable design and the positives produced by green design. Not only would owners be interested in this research, but also those in the construction industry, because this could help determine the importance of being able to provide sustainable design at a lower cost, but not necessarily be forced to deal with the hassle that so many complain about during the construction on a LEED rated building.

The beauty of analyzing LEED and green buildings and their importance but also differences is that this topic has become a hot bed of interest and information. Information would be able to be gathered from recent reports that can begin to be analyzed on the cost savings over the long run of a green or LEED rating building. I would also be able to collect data from a few green buildings, but also green buildings that received different LEED ratings and then compare the overall initial and projected long run costs, to determine if simply remaining green without LEED is the more profitable way to go. I will also be able to use my own thesis project, since the ASHA is attempting LEED silver, and I can therefore analyze the systems and determine if ASHA could have remained green and well sustainable while saving money.

Not only will hard data be able to be provided by analyzing research and contacting owners and contractors, but information will also be gathered from those within the industry. General contractors will be contacted as well as project managers such as T.J. Sterba who is the Project Manager of the ASHA project to determine the difficulties in the field and whether or not the LEED scorecard should be used or simply value engineering with sustainability in mind. Owners of projects will also hopefully be contacted to determine what makes an owner turn towards a LEED rating and whether or not sustainability is the primary reason. Also through the research it is hoped that possibly a simpler scorecard could be organized to determine the sustainability of a building on a much simpler level that could be used for general green ratings and sustainability rather than following all of the restrictions of LEEDS.

## Survey Questions/Interview Format

- Have you ever been a part of a LEED rated project?
  - If so why was a LEED rating attempted to be attained and what was the rating attempted and finally attained?
  - What difficulties occurred or worries occurred throughout the project that may not have occurred if the building was not LEED rated?
  - How much higher were the initial costs of the project?
  - What is the projected savings on the project due to LEED rating in the future?
  - In your opinion were the difficulties and restrictions worth a LEED rating in the end?
  - Will you pursue LEED rated projects in the future?
  
- Have you ever been a part of a project that simply wished to be green and remain sustainable without attempting to attain LEED rating?
  - Have you even been a part of a LEED project?
  - Why did you not attempt a LEED rating?
  - Were there still restrictions and difficulties that occurred due to the wish to attain sustainability even without LEED rating?
  - What were the initial costs compared to a non-green building, and what are the savings projected due to the design?
  - Was attempting sustainability worth the initial costs?
  - Do you wish you had pursued a LEED rating?
  - Will sustainability without LEED be pursued?
  
- Is sustainability the future of this industry with or without LEED?
- Do you believe LEED should be followed extensively or are future green and sustainable rankings going to be accepted?
- Although LEED is always a hot topic why is it not always used or not the most popular design system yet and will it be?
- Is the LEED scorecard too complicated causing its unpopularity?
- Should a simpler scorecard be designed for simple ratings?
- What should the scorecard include?
- If LEED is not used how should sustainable buildings be ranked or should sustainable buildings become a standard?
- In your opinion is sustainable design worth initial costs, and is it worth the change in the industry or should the industry remain constant?

## ***Problem Identification***

The American Speech – Language Hearing Association National Headquarters has done an outstanding job of not only remaining on budget but also on schedule. Permits became primary concern for the project and the start date the project since they were not attained on time. The project started late; however, this helped with the procurement of the steel for the structural system. Although the project started late since that delay the project has actually remained slightly ahead of schedule.

The ASHA is also attempting to attain a LEED silver rating. This has driven the initial cost of the building up, however since the ASHA owns the building they are hoping the long term costs will save them money in the long run. Following the lines of the above critical issues statement I hope to analyze the actual LEED rating and determine if it is possible to either allow the building to remain sustainable, but save a similar amount of money in the long run without having to attempt LEED rating or simply avoid LEED and see if the projected costs of the project can stay down. The ASHA is also currently requesting Davis to cut seven weeks off of the project due to the earlier complications with the permits. It is my hope to show that sustainable design can be used while also shortening the schedule and reducing initial costs while keeping long term costs down as well.

The ASHA is also a mixed building with both cast in place concrete with a structural skeleton and pre-cast concrete on the exterior façade. The building is somewhat repeatable from floor to floor with no major structural complexities other than the glass curtain wall. It is my belief that the structural system could be replaced with a C.I.P. system which is a highly used style in the Washington, D.C. area and could save the ASHA money. It would have also solved any procurement problems the ASHA would have had if the permits were received on time. The pre-cast would also be considered in the green and sustainable design to see how it still could have been used to reach the LEED silver rating of the project initially and the role it would play if green was no longer a concern.

The mechanical system in the ASHA building has also been designed to meet LEED specifications, and for an office building is quite expensive. Therefore I hope to re-design the mechanical system and pick a new one at a lower cost, but one that will also be sustainable for the building even if LEED does not consider it so, and then see if there are other ways in which the LEED points can be made up either through the mechanical system itself or by other means to show that a LEED silver could still be attained.

The ASHA was also a standard design-bid-build project. The ASHA however now would like the project to be shortened seven weeks, since they are current paying rent on their former building. It is my belief that this project could have been fast tracked due to the lack of limitations on the site the project could have been complete much earlier. I would also include on this fast track plan the use of the C.I.P. to reduce the procurement time. However, I would also compare a fast tracked project with steel and the same requirements as the original project to see the comparison of project costs and schedule to determine which makes more sense to pursue.

## ***Technical Analysis Method***

Though all of these analyses I intend to tie each aspect of the breaths, and other comparisons to the overall theory of LEED rating and its importance. I plan to analyze whether or not the LEED silver rating was necessary for the ASHA to attempt to attain from an overall cost and schedule concern. I will use my mechanical and structural breaths to re-design the systems for sustainability but not necessarily LEED and see if the project could have been completed earlier and under budget while still remaining green and sustainable without the tag of a LEED rating, or to see if the cost and schedule could have been improved while remaining LEED silver.

### **Analysis 1:**

#### *Problem Statement:*

Was the LEED silver rating of the ASHA Headquarters a necessary requirement and will it save in long term costs, or could the building have remained sustainable without attaining the rating which would lower the initial cost, but still remain near the long term energy saving of a LEED building. After speaking to individuals at Davis it seems that the LEED rating was simply being pursued for a title and not much more, the cost and schedule of the building are highly important to the owners therefore the question was raised if the LEED rating could have been avoided and if so how much money may have been saved.

#### *Proposed Solution:*

This concern is important to the industry and may be able to be solved through the creation of a new rating system. Owners usually attain LEED simply to have it and say their building is LEED for another selling point, however some owners are simply attempting sustainability without LEED to save costs, but remain environmentally sound while also analyzing the long term.

#### *Research Steps:*

For this LEED analysis I plan to research on multiple levels, from surveys, to the re-design and cost comparisons of the ASHA through my mechanical and structural breaths. Industry professionals, as well as owners will be surveyed to determine their LEED experience as well as any experience or regrets they have with LEED and how they wish the system would change as well as is personal sustainability a feasible solution. I will then re-design specific assets of my building so that the building may remain sustainable to some degree while lowering initial costs but attempting to maintain future saving. I will also attempt to see if it is possible through slightly different materials if the same LEED rating could be reached at a lower cost.

#### *Expected Outcomes:*

I hope to determine whether or not LEED will be pursued by the industry in the future and how essential its role is to keeping buildings sustainable and green. The entire industry from owner to contractor will be interested in order to determine whether or not

LEED will determine multiple jobs and if cost saving on LEED is possible or if “in house” sustainability is the future and LEED is ignored.

## **Analysis 2:**

### *Problem Statement:*

The structural system is a mix of C.I.P. with a structural steel skeleton, and a curtain wall on the outside façade with pre-cast concrete. It was brought to my attention however that if the permits had not delayed the project the concern of the procurement of steel remained as well as the overall cost of the steel.

### *Proposed Solution:*

The actual plan and floors of the ASHA are very similar. Therefore, I would replace the structural steel with C.I.P. This would not only remove the concern of procurement time on a tight schedule, but should also reduce the cost. I would also analyze if the project still could have received the LEED points necessary to allow the building to remain LEED silver.

### *Research Steps:*

A re-design of the structural system would ensue to convert the steel to completely concrete. After the re-design occurred a cost and schedule analysis would be completed to determine the affects of the change. The cost of steel and concrete would be compared to see if the cost could be driven down, while allowing the building to remain LEED silver. The schedule would also be analyzed since it is so important to the project, all while the overall sustainability of the building remains essential.

### *Expected Outcomes:*

Those industry professionals with similar projects as well as those involved with steel and concrete would be able to see the comparison not only on an economical level but also a LEED level. I would be able to determine that in theory while concrete may lower the cost is it conventional for a LEED rating or does a steel skeleton make more sense even in an area like the D.C. area that is dominated by concrete.

## **Analysis 3:**

### *Problem Statement:*

The mechanical system although somewhat simple for LEED and saves long term costs, the initial installation may be complicated and possibly delay the project, plus the initial cost is high for such a unit. Although the project is slightly ahead of schedule currently the PM on the site is worried this could affect the highly important schedule.

### *Proposed Solution:*

I propose that the actual mechanical system could be replaced with a simpler system that would allow the building to remain sustainable and help save energy in the

long run, but also keep the initial costs down and remove the complexities of installation. Although this may not help the building with LEED design it could keep the schedule shorter and initial cost down.

*Research Steps:*

I would do a re-design of the mechanical system that was less expensive in the initial cost but remained sustainable in the long term energy costs. A cost analysis would then be done and it would be determined if this system would improve an already tight building cost. The schedule would also be analyzed to determine if it could speed the project date up. A final analysis would be made to see if LEED points could be made up somewhere else and a silver rating could remain.

*Expected Outcomes:*

Those interested in LEED and general sustainability would be interested to determine if the initial costs of systems could be lowered while keeping high energy costs in the long term. Those interested in remaining sustainable but not wanting the hassle of LEED costs could remain confident that what they are using and designing will be affective.

**Analysis 4:**

*Problem Statement:*

The ASHA project was a straight design-bid-build project however the schedule is now being attempted to be shortened by seven weeks. This is a concern for the PM and those involved with the project, and although this is a non-profit organization that is not truly involved with design-build and fast tracking it may have been in their best interest to attempt it since they are currently paying back rent to their old building while they wait for the current building to be completed, therefore anything over schedule will affect the cost on more than one level.

*Proposed Solution:*

I would propose that the schedule and initial project be re-analyzed as a fast track design-build project. The project could then be analyzed under a new schedule to determine if a possible design-build fast track could have saved the project a substantial amount of time.

*Research Steps:*

The initial schedule would simply be analyzed as a fast track to determine the start date. The final date would then be determined using the same tasks and then compared to the original finish date to see if a substantial amount of time will be saved.

*Expected Outcomes:*

This analysis may begin to help push design-build and fast track projects onto jobs that may not initially accept them such as government jobs or inexperienced owners that may not understand the value and savings that can be gained.

<b>Weight Matrix</b>					
Description	Research	Value Eng.	Const. Rev.	Sched. Red.	Total
Analysis1	6	6	4	4	20%
Analysis2	3	7	6	4	20%
Analysis3	3	7	5	5	20%
Analysis4	5	4	4	7	20%
Issues Research	8	5	4	3	20%
Total	25	29	23	23	100%