

Non-Conventional: An Independent Outreach in Integrated Design and Construction Education

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In August 2011, Auburn University will be completing the second year of redesigned Master of Design Build (MDB) program – the only jointly hosted “Integrated” design and construction program in the United States. MDB is a collaborative effort between the School of Architecture and McWhorter School of Building Science. Managed jointly and delivered collaboratively by design and construction educators from both schools, a significant amount of input and instruction from industry professionals is interwoven. The MDB program has a focus on engagement with “real” clients. Clients have ranged from mid-sized southern cities to small, community based non-profits. Students are also encouraged to work on independent projects of a certain merit. This paper outlines results of an independent study addressing both the need for adaptive reuse and strategies for community-oriented organizations to engage in adaptive real-estate development. The project, carried out by two students and two faculty members illustrates the strengths of the integrated design and construction teams both in the context of academia and in the context of a non-conventional approach to community outreach and development. This preliminary study indicates that this approach is challenging and requires not only sophisticated financial knowledge but also advanced knowledge of design and construction services.

Key Words: Adaptive Reuse, Financing, Revitalization, Community Development, Sustainability

Introduction

The building industry is undergoing a paradigm shift that can be understood as a response to three interrelated forces: an *organizational* response, most visible in integrated forms of project delivery, to the inefficiencies of “traditional” practice; a *technological* response to the informational aspects of project design and management, most clearly manifested in Building Information Modeling; and an *environmental* response to the mainstreaming of the sustainability movement -- itself a response to environmental degradation and the threat of climate change, for which the built environment bears immense responsibility. While disruptive, the combination of these three responses yields an adaptable practice that above all seeks optimal performance in both process and product -- practically, socially, economically, and environmentally. As this shift carries out in practice, the academy is responding in various ways, but few institutions are able to quickly adapt within the constraints of already-established design and construction programs. Through the timely formulation of a new, post-professional program in integrated design and construction Auburn University has found a means to adapt.

Auburn University’s Master of Design Build (MDB) program is the only jointly administered and delivered, degree granting, “integrated design and construction” program in the United States. The curriculum covers aspects of both design and construction, managed jointly and delivered collaboratively by design and construction educators from both the School of Architecture and the McWhorter School of Building Construction, along with significant input and instruction from industry professionals. The curriculum presents students with different “looks” of integrated process. The program begins with relatively traditional project design and preconstruction arrangements. By the end of the curriculum, students work in a fully integrated design and construction studio – Design Track students and Construction Track students co-located on the same project. The three-semester MDB program accepts students with a design or construction background into the Design Track or Construction Track, respectively.

A hallmark of the MDB program is engagement with “real” clients: various organizations or companies interested in real design and construction solutions, but for various reasons not in a position to begin the process with professionals. Clients have ranged from mid-sized southern cities to small, community based non-profits, to local schools and small-businesses. While most of the program’s projects are organized and coordinated by faculty to be carried out in a studio setting by the entire cohort, students are also encouraged to work on independent projects. In the spring of 2010, two students proposed an independent study focused on adaptive reuse strategies for community-oriented organizations. The study provided valuable conclusions on multiple levels: 1) The results of the study are viable and pertinent to the community organizations, especially in the southeast; 2) An integrated team of designers and constructors can add efficiency and value to the real-estate development process; 3) The benefits of integrated design and construction in practice can also be manifest in an approach to design and construction education.

Context for Independent Study

Vacant industrial buildings present municipalities with complex challenges in community revitalization. This has been especially true for small to mid-size towns in the Southeastern United States where these abandoned facilities once composed the majority of a town’s basic-sector jobs (McNamara, 2010). As economic shifts in the basic-sector occurred, many industrial facilities were left vacant because it was not feasible to renovate the existing structure for new industrial uses. The self-reinforcing effects of a vacant industrial facility produced extreme negative outcomes for the surrounding area. (Preservation North Carolina).

At the same time, many communities have struggled to fund non-profit and cultural entities that serve the local population. These entities often compete for the available funds within the community (Brown, 2010) and play a major role in the revitalization of communities. There is a need to change the nature of how the funding of these social enterprises is perceived by the public. Many non-profit leaders are beginning to evaluate the traditional methods of funding their operations, looking to a more entrepreneurial model that involves the use of fixed revenue from real-estate to assist in servicing the operation expenses accrued. As a result, communities no longer must rely on the alignment of market forces that would draw private developers to revitalize a vacant industrial facility.

One of the leaders of this movement is the Manchester Bidwell Corporation in Pittsburgh. The Manchester Bidwell Corporation is a non-profit organization that specializes in community education and workforce development. The assets owned and operated by this organization contribute a rental income of approximately \$810,000 annually. This income is used to help fund their mission within the community. (Heskitt, 2007).

Pairing this entrepreneurial approach to funding social enterprises with the adaptive reuse of industrial facilities may provide a lucrative approach to community revitalization. Reuse is considered by many to be a sustainable approach to infill development and community growth (Schilling, 2002). The reuse of large industrial facilities for the purpose of community developments that house multiple non-profits and revenue generating tenants represents a potentially ideal alignment. It is common for these entities to have similar purposes and outreach programs. Providing a large shared space within an existing industrial building to house these operations makes economic sense. It allows these firms to benefit from shared resources and infrastructure, and pairing these facilities with revenue generating tenants can help make these programs more financially sustainable.

However, efforts to reuse prominent industrial buildings often encounter financial obstacles, restrictive zoning and codes, contamination, and structural problems that make the first costs difficult to justify. Many private-lenders are unwilling to fund reuse projects because of their perceived higher risk, making it difficult to find funding for rehabilitation (Cantell, 2005). Fortunately, there are several financial incentives that can be used to make reuse of vacant structures for community developments more economically feasible. The benefits of these financial incentives are made more readily attainable through the employment of an approach that integrates downstream design and construction considerations with early financial planning and programming.

Financing Industrial Renovation Projects

While many believe that reuse presents challenges with respect to cost, sources suggest that reuse does not cost any more than a greenfield development. North Carolina has supported the reuse of its industrial mill buildings and has found that the sq. ft. cost of rehabilitation for reuse is less than or equal to new construction. The projects studied encompass per sq. ft. costs ranging from \$30 to \$125 per sq. ft., dependent on the condition of the building and the requirements of the new use (Preservation North Carolina). The use of tax credits can close the gap between new construction and restoration if one exists. These credits promote reinvestments in existing disturbed areas, promote development in distressed communities, and protect historic resources (Cantell, 2005). Major incentive vehicles and their implications are outlined below.

Historic tax credits (HTC) play a significant role in creating equity for adaptive reuse projects that possess historic significance. Since the Tax Reform was enacted in 1976, the HTC program has leveraged more than \$45 billion in private funds. The credits can be used for any income-producing project (OCC, 2008). Large abandoned industrial facilities located in smaller towns generally have historic significance as the economic drivers in their community. The historic tax credits are the most liquid financial incentive available to community developers.

The passage of the Tax Reform Act of 1986 established the Low-Income Housing Tax Credit (LIHTC). The LIHTC rewards property owners for providing low-income rental housing to the surrounding area. The IRS allocates federal tax credits to State Housing Credit Agencies (HCAs). HCAs award tax credits to eligible affordable housing developers. The credits apply to both rehabilitation and new construction. It can be twinned with the HTC to provide additional equity for adaptive reuse projects and make such projects affordable. In order to receive the credits, developers must set aside a percentage of the units for residents that earn approximately one-half of the area's median income. Also, these units are subject to rent restrictions with a gross maximum per unit rent.

Created in 2000 by the Community Tax Relief Act, the New Market Tax Credit (NMTC) program seeks to leverage capital from investors to urge economic development in urban and rural low-income communities. Within the Treasury Department, the Community Development Financial Institutions Fund (CDFI) and the IRS jointly administer the program. A participant of the NMTC program must be certified by the CDFI as a qualified community development entity (CDE) before submitting an application for a tax credit allocation. An NMTC application is evaluated by the CDFI fund on the basis of the CDE's business strategy, capitalization strategy, management capacity, and projected community impact (OCC, 2007). The CDFI allocates NMTC's to CDEs, which then offer the credits to investors in turn for capital. The proceeds from investors are referred to as Qualified Equity Investments (QEIs). A CDE uses the QEI proceeds to give financial assistance to eligible businesses known as Qualified Active Low-Income Community Businesses (QALICBs).

The Environmental Protection Agency's Brownfield Program started in 1995. The program gives incentives to assess and clean up brownfields for reuse. The program offers financial and technical assistance for assessments as well as clean up costs. There are four types of funding opportunities available for brownfield sites: 1) Assessment Grants, 2) Revolving Loan Funds, 3) Clean-Up Grants and 4) Job Training Grants. The Brownfield clean up revolving loan fund pilot programs are funded up to \$1,000,000 per program. These grants provide funding for grant recipients to capitalize a revolving loan fund and to provide sub grants to carry out cleanup activities. Clean up grants provide a maximum of \$200,000 per site and do not have to be repaid. There are tax related incentives for brownfield sites available as well. In August 1997, the federal government established a Brownfields Tax Incentive under the Taxpayer Relief Act. This program allows cost for environmental cleanups to be claimed as fully deductible business expenses in the year in which the costs were incurred or paid. The tax incentive elapsed on December 31, 2009, but the incentives may be extended (Harris, 2010).

Equity generated from the sources above is not always enough to fund large reuse, community development projects. A mix of financing is generally required. Since adaptive reuse projects often act as catalysts for future redevelopment, there is an incentive for local jurisdictions to subsidize such projects. There are two types of public subsidy: 1) direct subsidization in the form of grants and 2) indirect subsidies in the form of preferred tax treatment such as property tax freezes. Many times there is a need to provide "gap financing" for reuse projects that can create equity using the sources above but cannot receive conventional private financing (Cantell, 2005). Local tools used to bridge the gap include payments in lieu of taxes (PILOTS) and tax increment financing (TIF).

Tax incremental financing was originally justified as a local method of self-financing the redevelopment of blighted areas. Economic development projects are financed with tax revenues by the new development. Government officials can tap into their local property tax base for development use funds for a variety of development prospects. TIF revenues are more often used to pay debt-service costs (often tax free) over the life of the project, often a 20 – 30 year period. This is referred to as “pay-as-you-go” financing. TIF is also effective at generating large amounts of capital for up front capital investments (Johnson, 2002).

Case Study: Taunton, Massachusetts

“Robinson on the River,” located in Taunton, Massachusetts provides a distinctive case study for the application of non-conventional financing for reuse. The project consists of the reuse of a historic 140,000 square-foot textile mill that occupies a 6.5 acre brownfield site. The project incorporates mixed-use, smart growth renovation that has created affordable housing and commercial space while restoring public access to the site’s green space.

Funding for the project was spurred by a local non-profit community development corporation as part of a five-year strategic redevelopment plan. In acquiring the property, an innovative purchase and sale agreement stated that “the property acquisition would be dependent upon the completion of permitting, financing, and environmental due diligence activities.” With the agreement and ‘environmental diligence’ stipulations, investors received assurances needed to commit funding to the project (Bodine).

Nearly \$15 million dollars was raised for the project through a variety of sources. While the site’s historic status increased redevelopment costs, it allowed for various tax credits, loans, and special financing not available to new-construction. These special financing sources included brownfield loans, EPA cleanup grants, low income and federal historic tax credits, state historic tax credits and affordable housing trust funds. Non-conventional funding allowed the mill to transform from its abandoned state into sixty-four affordable housing units and 18,000 sq. ft. of commercial space. Smart growth strategies have allowed residents to move into a “village environment with access to transportation, shopping, recreation, and housing.” The development also opened up new river access and new recreational uses for the community (Bodine).

Case Study: Raleigh’s Contemporary Art Museum

Raleigh’s Contemporary Art Museum (CAM) located in Raleigh, North Carolina provides another unique case. The project utilized various means of financing including Historic and New Market tax credits in the reuse of a 20,000 square foot grocery warehouse built in 1927. A partnership developed when CAM merged with the North Carolina State University College of Design to extend the college’s “Art and Design in the Community Initiative.” The warehouse was developed into three gallery spaces that incorporated dedicated educational spaces that expanded the college’s K-12 outreach and introduced students and community to a broad range of creative learning opportunities.

After purchasing the building for \$460,000, CAM was able to reserve the additional \$4.5 million it estimated for rebuilding the warehouse through new economic development tools. Following the lead of the new Civil Rights Museum in Greensboro, and the American Tobacco Campus in Durham, CAM sought state and federal historic tax credits. Additionally, the museum’s location inside a low-income census tract allowed it to use the federal New Markets Tax Credit. Half of the museum’s construction cost, nearly \$2.5 million, was covered through these credits.

CAM restored an empty downtown building. They invested in an area with “higher-than-average unemployment” bringing “jobs, education, and vitality through improved neighborhood appearance and pride.” The museum has become an important cultural destination in the region. The museum stands out as “a polka-dot butterfly in a canyon of red brick” and succeeds through a creative financial and programming approach (Shaffer, 2008).

Case Study Application: Old Textile Mill Conversion for Center of Arts and Technology

Program Strategy

The project was carried out primarily by one design-track and one construction-track student in the MDB program. Weekly briefings were held with advising faculty (also one from each track) in order to review work-to-date and establish direction. Two key reviews were held – one at mid-semester, one at semester's end – that included an extended “jury” of faculty from both the school of architecture and the school of building science (construction).

This study and proposal represents a plausible project for a real site in the Southeast. The site consists of an abandoned textile mill that has over 250,000 sq. ft. of floor space. The programming decisions surrounding the new development are driven by a purpose to further the advancement of a community through the repurposing of a past economic driver. The reuse of the building will provide programming for youth and adult education through arts, science, information technology, and workforce development. The proposed center will maximize community and corporate involvement, minimize economic and ethnic segregation, and enhance the futures of the region's youth and underserved adults. One of the critical success factors of the development is to provide a fixed source of revenue from an anchor tenant. The proposal schematically defines four main areas of program that have specific adjacencies. These areas include residential units, office space, a common grand atrium, and classroom and lab space that supports the non-profit's mission. Also, the structure will house an incubator space for business start-ups.

The bulk of the Eastern portion of the building combines proposed low-income and transitional residential units in the front, with office space filling the rear. A new masonry wall constructed of reclaimed brick from on-site demolition work will physically separate the residential and office components while allowing for an atrium space to provide natural day lighting. At grade, the residential component incorporates five live-work units and two large retail spaces. This ‘storefront’ area becomes an extension of the downtown community.

The Central and Western ends of the building compromise the non-profit entity. Two main entrances allow entry to the ground floor of a common grand atrium space. Centrally located office and administration space, and a business incubator space fill this central core. The open floor plan enhances the chance for youth and adults to overlap and open eyes towards possible career paths. Classrooms and labs are distributed and sized to allow for various shared uses. This allows spaces to accommodate the non-profit as it transitions and adapts to the programming it could offer. Two large galleries at the Eastern end of the building provide additional gallery space. In summary, the development includes approximately 75,000 sq. ft. of space leased to tax-exempt entities and 90,000 sq. ft. of for-profit tenants. The remaining floor area is non-assignable space and common spaces.

Available Financial Incentives

The historic significance of the mill in the community makes the structure available for the federal HTC program. No state historic tax credits are available. The building has been registered with the National Register of Historic Places. The nature of the building's programs makes the development an eligible prospect for the LIHTC and NMTC. Also, the site of the old textile mill has been declared a contaminated site eligible for the EPA's Brownfields cleanup programs. In addition, the local municipality is highly motivated for the project and has pledged a direct subsidy in the form of a grant for site improvements, façade improvements, and debris removal.

In the case of the LIHTC, the IRS treats a condominium unit as a separate building. There is currently no guidance on whether the IRS will follow a similar rule with respect to the NMTC. However, if a similar rule is followed, it would be possible to divide a building into one residential condominium unit composed of multiple residential apartments and a separate commercial or tax-exempt entity. Each condominium unit could be owned by a different entity and have separate investors. The housing condominium unit could be financed in part with the federal LIHTC. The commercial portion of the building could be financed with the NMTC (Gadon & Lubersky, 2003).

The total development was predicted to cost \$20,018,648. These costs include land acquisition, construction costs, legal and financing costs, and other soft costs. The analysis assumed that the project applied and received the twenty percent HTC as well as the nine percent LIHTC for the portion of reuse project that will be made up of residential units. In addition to these funds, it was assumed that the development would partner with a Community

Development Entity approved for the remainder of the first costs. These costs will be financed with a seven-year interest only loan and a secondary subordinated loan. Table 1 details the sources of funding.

Table 1

Debt and Equity Sources for Old Mill Project

| Funding Source | Dollar Amount |
|--------------------------|---------------|
| City Grant | \$ 800,000 |
| Brownfield Grant | \$ 400,000 |
| Equity Yield from HTC | \$ 3,234,112 |
| Equity Yield from LIHTC | \$ 1,652,924 |
| NMTC | \$ 5,433,329 |
| Subordinated Loan (CDE) | \$ 2,786,322 |
| Interest only Loan (CDE) | \$ 5,711,961 |
| Total | \$20,018,648 |

Pro-Forma Analysis

A ten year cash flow statement was prepared to analyze the feasibility of the project based on the first cost pro-forma and the financial incentives described above (Table 2). Two office tenants committed to ten year leases at \$22 per gross square foot annually. Also, the cash-flow includes low-income housing rentals at ninety percent occupancy, two retail revenue generators at ninety-five percent occupancy and incubator office spaces at sixty percent occupancy. It has been predicted that these spaces will generate annual revenue of \$1,405,403.

Table 2

10 Year Cash Flow Projection for Old Mill Project

| For Year Ending | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Revenues Total | \$1405403 | \$1426484 | \$1447882 | \$1469600 | \$1491644 | \$1514018 | \$1536780 | \$1559789 | \$1583176 | \$1606924 |
| Operating Expenses Net | \$554036 | \$562,347 | \$570,782 | \$579,344 | \$588,034 | \$596,854 | \$605,807 | \$614,894 | \$624,118 | \$631,699 |
| Operating Income | \$851367 | \$864137 | \$877100 | \$890256 | \$903610 | \$917164 | \$930921 | \$944885 | \$959059 | \$975226 |
| Total Debt Service | \$766010 | \$765950 | \$766010 | \$766010 | \$766010 | \$766009 | \$766009 | \$971849 | \$971850 | \$971849 |
| Pre-income Tax Cash Flow | \$85357 | \$98187 | \$111089 | \$124246 | \$137600 | \$151155 | \$164912 | (\$26964) | (\$12791) | \$3377 |
| Debt Coverage | 1.11 | 1.13 | 1.15 | 1.16 | 1.18 | 1.20 | 1.22 | 0.97 | 0.99 | 1.00 |

The analysis suggests that the project is not feasible based on the initial concept that this distribution of revenue generating space would offset the debt and estimated operating expenses of the non-profit space. In order to refinance the seven-year interest only loan originated by the CDE in exchange for NMTC, the non-profit would have to enter into a lease agreement for at least \$220,000 per year. This would bring the debt service ratio to 1.20. Also, it is difficult to predict the terms of the refinanced loan seven years out. The interest rate for a commercial loan in seven years is likely to be higher than the current rate. The tax-exempt entity would most likely not be able to afford the subsidized rent values in order to service the debt without hurting the community impact.

The programming of the reuse project must be adjusted in order to meet investor preferences for return. The amount of leasable footage allocated to the non-profit must be reduced in order to justify the development. The market may not be able to bear the amount of additional office space or residential space needed to service the project's debt and

expenses. At the stated cash-flow, it would be difficult to find a CDE that would be willing to make an equity investment for the NMTC. The purpose of NMTC induced loans is to provide cash-flow producing businesses with a start-up loan. Most CDEs will expect the entity to be self-sustaining after seven years. It is possible that the non-profit organization could form its own CDE and sell the credits for equity directly, but the costs of executing this method greatly exceed the costs of partnering with an existing CDE.

Study Analysis and Conclusions

Students drew several conclusions from the study. First, the amount of space allocated to the non-profit dominated any revenue realized from the other spaces in the development; the fifty-fifty share of space (for-profit to non-profit) in the study project may not be an ideal ratio for spatial use. A community development that wishes to reuse an existing industrial site and take advantage of the financial incentives available should look to attract a larger share of revenue generating tenants than its own spatial use. Secondly, designers of reuse projects should limit the amount of common space and non-leasable space. Third, constructors can work closely with designers to more effectively reduce the total cost of construction without sacrificing quality. Lastly, social enterprises will need to generate revenue within their operations in order to sustain control or ownership of a reclaimed site. More CDEs will be willing to lend to the development if the non-profit has the ability to generate revenues while accomplishing their social goals.

While there are several financial incentives available for the reuse of industrial sites, research suggests that these incentives are not easily acquired for community-oriented developments. Many of the expectations present in conventional commercial lending are still apparent in the application processes for the programs described above. The need for a non-speculative income producing bottom-line is still a priority for most of these financing opportunities, especially the NMTC program. The study above suggests that there is an economic reason why most industrial reuse projects serve as either housing or mixed-use projects with a mix of retail and housing. A large presence of subsidized leases for non-profit organizations will most likely lead to a financially impracticable project. This works against many prospective blighted sites where the market cannot support large quantities of housing or retail. Since most community developments will not be able to achieve one-hundred percent financing because of the reasons stated above, the use of “gap financing” techniques will be necessary for many industrial sites. Communities should explore the use of Tax Incremental Financing and PILOT programs to assist revitalization projects. These creative financing techniques can make reuse projects with a focus on social impact possible.

Further study is needed on the types of social enterprises that may be capable of generating revenue or how existing models could be innovated to shift toward revenue generation. The complexity of the financing package also will limit the use of the proposed approach. Methods need to be developed and made accessible so that multiple approaches can be combined more easily to help make community revitalization projects more viable. Finally, there appears to be a demand in the market for ground-up innovation in the construction financing markets. Traditional approaches will not yield viable reuse projects in the area of community development.

Pedagogical Conclusions

An integrated approach to development, design, and construction has the potential to provide a perspective and a degree of flexibility to quickly adapt to the financial and cultural challenges of this type of community development. While the proposal put forth in this study suggests that the project is unfeasible from a financial standpoint, the structure of the team, which includes design and construction expertise, allowed that conclusion to be arrived at quickly. At this stage, iterative redesign and recalculation of both the building and its operating pro forma can be carried out very efficiently. Just as this study presents opportunities for non-profits to bolster operations while “giving back” to communities through an entrepreneurial approach, it also highlights potential new alliances for real estate, design, and construction professionals interested in community-oriented work.

The authors view both the manner in which the study was performed and its conclusions as further evidence that the integrated design and construction curriculum of the MDB represents a value-add over and above an undergraduate education in either design or construction. More importantly, perhaps, the results support the assumptions that a collaborative post-professional education offers a soft-skillset that probably would not be attained in a year of entry-level work in the field. It has been made clear in multiple other venues that the industry is moving in the direction

of greater integration. The authors feel that the benefits of this organizational shift are evident in the work carried out at the academic level. In addition to “learning” collaboration, a design and construction pedagogy focused on outreach and engagement in real communities provides an additional level of exposure and sensitivity to existing conditions that might also be lost in the “hypotheticals” of traditional education or in the insulated nature of entry-level work. When the faculty set out to create a new “design-build” curriculum, attuned to the requirements of the future of industry, a number of assumptions had to be made. This project represents what the authors hope to be a number of successes that bear out those assumptions.

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