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This thesis explored how historic school facilities can be altered to meet ever evolving educational needs without sacrificing their distinctive historic character. The schools analyzed in this study are North Carolina high schools built in the 1920s that still remain as schools. High schools from the 1920s represent buildings that were constructed in an educational boom period in the country and became icons for their surrounding community. Today as older schools continue to be closed and are replaced with more costly and resource demanding new construction, the importance of finding ways to continue to utilize and preserve these iconic buildings becomes more evident. The six historic high schools selected for this study serve as a model for the ongoing preservation and utilization of school buildings for evolving educational needs. For each of the six selected high schools, the methods of analysis included review of the National Register of Historic Places nominations, archival research, visual analysis of archival photographs and architectural plans, and site visits (documented with current photographs) to determine how alterations have been made to the interior of each school while still retaining historic character. The ways in which the campus was able to expand and how technology was implemented were also evaluated. The evaluation led to the identification of how high school buildings from this era remain as viable educational facilities. The study generated a variety of similarities as to how each school addressed certain renovation issues. The findings therefore may serve to highlight examples for designers, school boards, and communities to utilize in hopes of preserving and

continuing the utilization of historic schools instead of demolishing or adapting them for different uses.



1920'S NORTH CAROLINA HIGH SCHOOLS ADAPTING TO TWENTY-FIRST  
CENTURY NEEDS

by

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## APPROVAL PAGE

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## CHAPTER I

### INTRODUCTION

North Carolina has over 700 public school buildings that have been closed, sold, or left vacant (Obtained from the School Planning Section of the N.C. Department of Public Education, 2012). There is a common public misconception that older schools are not fit for continued educational use. They are considered out of date, too small, or too expensive to renovate, yet there are 209 schools currently being utilized that were built prior to 1940 in North Carolina. Of those 209 schools, 94 of them were built in the 1920s (Obtained from the School Planning Section of the N.C. Department of Public Education, 2012). The 1920s was a time of growth in the construction and enrollment of schools, particularly secondary schools, across both North Carolina and the country. New city schools received more funding and larger enrollments than rural schools throughout North Carolina. Also, city high schools tended to be four times larger than their rural counterparts (Goldin, 1998). With increased state funding and rapid urban growth, educational facilities in North Carolina became a showplace on par with most state educational facilities around the country. Almost every city of significant size in the state built a new high school between the end of World War I and the early years of the Depression (Harris, 1990). Increased funding for educational buildings allowed city schools to achieve their desired facility designs and reach higher educational standards. High schools built in the 1920s serve as a reminder of the significance of that time period

for American education. Their continued use as educational facilities should be a priority.

### **Site Selection**

This thesis focused on school buildings from the 1920's, specifically high schools. High schools from this era represented construction from an educational boom period in the country that created icons for their surrounding community. The analysis of the schools that have survived nearly 100 years and that continue as high schools will illustrate how they can be successfully preserved and utilized for evolving educational needs. The intention of this thesis is to show that school buildings, specifically high schools from the 1920s, can continue to be used as educational facilities without losing their historic character. Historic character is all the visual and physical elements that comprise the appearance of an historic building (Nelson, 1988). The selected sample of schools in this thesis can be viewed as models for other schools from this era to be preserved and to continue as schools instead of being demolished or adapted. In particular both designers and school boards can reference the case studies highlighted in this thesis for examples of how certain alterations can be made if necessary while retaining historic character.

The schools selected are all located in an urban context and geographically represent the state. They are located in the western, central, and eastern parts of North Carolina. Their regional diversity illustrates that the construction of these iconic high schools was not occurring in a singular portion of the state during the time but was a

trend throughout the entire state. All six of the 1920s high schools are still currently operating as high schools.

The sample of high schools in this thesis includes Roanoke Rapids High School built in 1921 in Roanoke Rapids, Richard J. Reynolds High School built in 1923 in Winston-Salem, Asheville High School built in 1929 in Asheville, Greensboro (Grimsley) Senior High School and James Benson Dudley High School both built in 1929 in Greensboro, and Needham B. Broughton High School built in 1929 in Raleigh. Each of these buildings represents the time period of 1920-1930 when schools were being built as grand icons for their surrounding community. These high schools were designed by notable architects of the time in North Carolina, including Hobart Upjohn (Roanoke Rapids), Charles Barton Keen (Reynolds), Douglas Ellington (Asheville), Charles Hartmann (Grimsley & Dudley), and William Henley Deitrick (Broughton). The architects that designed these prominent educational buildings had experience in a variety of other building designs, including churches and private residences. Whatever the architects' experiences, they gained high accolades for their designs.

## **Architects**

Some of the architects' notable experience and projects brought about their appointment to design the North Carolina high schools being researched. Hobart Upjohn designed over twenty educational buildings in North Carolina, with the majority of the buildings belonging to the campus of North Carolina State University. Before designing Richard J. Reynolds High School, Charles Barton Keen was most notably recognized for

designing the Reynolda House in Winston-Salem. Douglas Ellington was famous for his public and religious buildings in Asheville. Asheville High School was just as monumental in design as his Asheville City Building or First Baptist Church designs. After Asheville High School, Ellington went on to design several other educational buildings in Buncombe and Orange counties. Charles C. Hartmann designed both Greensboro (Grimsley) Senior High School and James B. Dudley High School. He previously had little experience in educational buildings, only designing a handful, which are still notable designs. Hartmann was known for a variety of works in commercial and residential architecture. The design of Needham B. Broughton High School defined William Henley Deitrick's reputation as a renowned architect. While Deitrick designed a variety of building types, it was through this involvement in educational building designs that his firm was able to thrive during the years of the Depression. At the end of his career, Deitrick had designed close to twenty prominent educational buildings throughout the state. All six of the high school case studies are prestigious buildings designed by prestigious architects in a time that is unique to education and their significance is even more solidified by their National Register of Historic Places status.

## **Method**

This study was conducted through archival research, analysis of original plans, archival photographs, current plans and photographs as well as site visits to each school. By analyzing original floor plans in comparison to current floor plans, the researcher highlighted the significant changes that occurred on the main level of each school. The

main level was analyzed as opposed to all levels of each school because the main level contains the most public spaces and, consequently, the most architecturally distinctive detailing. It also includes an equal representation of spaces constructed in each school. Lobbies, administration offices, classrooms, corridors, and auditoriums are all located on the main level.

Both primary and secondary spaces contained on the main level were analyzed in this thesis. The primary spaces analyzed included school entrances, lobbies, corridors, and auditoriums. Primary spaces are often places in a building that the public uses and sees the most (Jandl, 1988). They are normally the most architecturally detailed spaces as well and are important to the character of the building (Jandl, 1988). In regards to this thesis, public is defined as spaces where persons, other than staff and students, have access to the building. Secondary spaces include classrooms. Both of these spaces were selected because each school building in the selected sample had each of these types of spaces in common. By selecting a level that contains similar room usages throughout the selected case studies, a more complete representation of school spaces could be analyzed. These are also key defining spaces in the school building. The schools were identified as having taken an intervention approach to rehabilitations as opposed to taking an insertion or installation approach according to Brooker and Stone (2004). While the way in which the intervention approach to each school was analyzed, each space was also analyzed with the criteria: form, proportion, rhythm, scale, light, materials, finish, and detail. The utilization of the criteria aided in the identification of prevalent patterns. Throughout the research investigation the following questions were addressed:

- How have the key spaces (front entrances, lobbies, corridors, classrooms, auditoriums), including the front façade, been rehabilitated over time to accommodate the evolving educational needs while preserving their historic character?
- How has expansion of the building/site been accommodated?
- What was the impact of the introduction of technology to the classroom instruction and building systems?

While there are examples regarding the adaptability of schools to other uses, this thesis focused on maintaining schools as schools.

## **Importance**

The adaptive use of historic buildings is a common and appropriate solution for revitalization of properties that no longer meet their original purpose. Old mill buildings have become places for business, food, and shopping and old school buildings can be places of residence. There are numerous examples of adapted high schools across the state including Ahoskie High School adapted into apartments, Mt. Olive High School converted into apartments for the elderly, former Pomona High School also adapted into apartments, and Garner High School, now used as Senior Housing and Performing Arts Center. At one point, even Dudley High School was threatened with demolition. But with the support of loyal alumni, the school was saved and continues to thrive as a high school.



The focus of this study is not on schools being adapted to new uses, but rather schools remaining as schools. For, there are far too many sound school buildings in North Carolina standing vacant for us to turn our backs on, buildings that have stood as community icons for decades, symbolizing the pride and value placed by the communities on these buildings. This thesis analyzed how six prominent N.C. high schools from the 1920s that remain in use can retain their historic character and iconic presence despite alterations and changes over the decades.

There were many reasons why historic schools were of interest for this thesis, but two stand forefront. Not only do 1920s high schools represent an iconic educational building boom in history, but the continued use of these schools offer numerous benefits including economical and eco-friendly benefits. When looking at the continued contribution “of our existing school buildings to the education of our families, [it] is not only practical, cost effective and sustainable, the act of revitalizing these campuses reinforces the fabric and heritage of our communities, conveying our core values to the next generation” (O’Donnell, 2010).

Historic schools reflect the culture and values of the surrounding community. These historic schools were generally located at the center of the community (*Community-Centered Schools Offer Numerous Benefits*, 2010). Being located in the center of the community was ideal for communities to easily access the school. Currently, historic community-centered schools offer advantages. First, they keep travel distances short, which in turn helps both the environment and encourages healthier families because the students can walk or bike to school supporting exercise and reducing

car pollution (*Community-Centered Schools Offer Numerous Benefits*, 2010). Second, community-centered historic schools encourage close ties with community members and increase property values. Third, utilizing historic schools saves construction and operating costs because new construction is not taking place (*Community-Centered Schools Offer Numerous Benefits*, 2010).

With greater public access, education played an increasingly significant role in the lives of students and communities at the turn of the 20th century. As education was becoming an important issue across America, prominent architects were hired to design and build the schools that were educating the people and, in the process, these architects looked to reflect the prevalent educational and cultural values, creating buildings reflective of the times. One may consider that the influence of higher education standards led to the hiring of architects to design the buildings that would shape the students who attended them and the buildings shaped their communities. Architecture can impact lives, and school buildings exemplify this power more so than any other building type because schools are where people learn and develop (McKnight, 2011).

The research on these six historic North Carolina high schools determined how they had been altered to accommodate evolving needs of space, allowing for their continued use while preserving their architectural character and the sense of community they have created. This research was conducted in hopes that these six high schools may serve as a model for school boards that have similar buildings from this era, illustrating that historic schools can retain their intended use while maintaining their historic character. In particular, the reason that these six high schools have kept their historic

character throughout their use has been through the implementation of restrained intervention. These buildings may also serve as a model of restrained intervention for designers seeking to retain historic character while altering 1920s schools.

## CHAPTER II

### LITERATURE REVIEW

To provide context and background for the thesis research, this chapter will provide 1) an overview of current preservation scholarship on the issues of authenticity and integrity as it applies to the sensitive rehabilitation of historic buildings, 2) an overview of the history of high schools in the United States and North Carolina, 3) the history of 1920s education and school design in the U.S., 4) current school design practices in the U.S., and 5) the history of each of the six National Registered high schools in this study. In order to grasp the significance of 1920s school architecture, an understanding of the history of school architecture and educational curriculum and theory is necessary.

#### **Historic Preservation**

An historic building has architectural, aesthetic, historic, documentary, archaeological, economic, social, political and symbolic values, but the impact is always emotional (Feilden, 2003). Historic preservation seeks to preserve and maintain these elements and the meaning they convey. When historic resources are saved, so is the physical link to the past and the cultural and economic benefits of preservation can be enjoyed as well. When historic resources are destroyed, their value as a catalyst for

economic development and community revitalization will have been destroyed also (Howard, 2007). The retention of physical sites allows for a better understanding of the past because the experience is tactile, visual, and can be experienced (Stipe, 2003). A community's sense of history and identity resides in the survival of historic buildings. These buildings can be considered a community's heart and soul (Howard, 2007). "Historic buildings add to a sense of self, a shared identity, and a collective memory and culture" (Prudon, 2010, p. 14) and the retention of these is crucial to historic preservation.

The historic preservation movement has undergone a transformation since the National Historic Preservation Act of 1966, which created the National Register of Historic Places, National Historic Landmarks, and the State Historic Preservation Offices. During the early years the primary focus of preservation was on architecture as an art form and on the importance of buildings to history (Rypkema, 2010). But as preservation has evolved, so to has the philosophy. Preservation today has evolved not only to include places of inspiring architecture and history but also to places that are significant to local communities surrounding the resource (Rypkema, 2010). The shift from mainly preserving exquisite architectural and historical buildings to ones that have more local community identity has occurred because preservationists have come to understand that all buildings tell a story and are important to someone.

Since the early onset of historic preservation there has been a hierarchy in place regarding what defines an historic building's character. Historic architectural character is defined as all the visual and physical elements that comprise the appearance of an historic building (Nelson, 1988). The hierarchy is established from most public spaces to least

public spaces and includes the exterior, interior public (primary) spaces, and interior private (secondary) spaces. The exterior of an historic building is the most prominent and public aspect that conveys the overall visual character of a building (Nelson, 1988). The retention of the exterior is crucial to keeping the architectural character since it is the most widely viewed. The interior of an historic building can convey the building's history and development over time and almost all rehabilitations will involve to some degree alterations of the interior (Jandl, 1988). The interior of a building contains both primary and secondary rooms. The primary rooms, like the exterior, are the most widely viewed by the public. The areas that are encountered the most are considered to be the spaces that should be more sensitively approached during rehabilitations. The elements of an historic building that are not as visible are less important to the character of the building and have more flexibility in terms of what is allowed to be changed during a rehabilitation (Leimenstoll, 1997). The order of architecturally significant elements of an historic building was established in order for historic buildings to maintain their character during rehabilitations. But in order to define which buildings are truly historic to a community, state, or the country, preservationists review a building's authenticity and integrity.

### *Authenticity*

A building's authenticity and integrity is what makes a historic building unique to its surrounding counterparts. According to Stefan Tschudi-Madsen (1985), there are five different areas of authenticity: material, structure, surface, and architectural form and

function. The first area, authenticity of material, means that the material and the form of the material used in an historic building should remain consistent with what was originally used. The original structure that defined the building should not be altered either. Much in the same vein, the surface of the building has caused some debate amongst preservationists. Although many preservationists would like for all of the original fabric of a historic building and its patina to be maintained, change is sometimes unavoidable. The last two categories of authenticity according to Tschudi-Madsen, form and function, are less disputable for preservationists since these are more difficult to alter. Ideally the form of a historic building remains as it originally appeared, while the function of the building should remain the same whenever possible. Thus, a school should remain a school, a church should remain a church, and so on. The reason why the original historic function is preferred over an alternative is because when a building continues to be used in the same way fewer alterations will need to be made and its use remains authentic. But if the original intended use of a building is no longer needed, the building's continued use is most important. It is when buildings become vacant that the most deterioration takes place and eventually the building is often lost.

While Tschudi-Madsen, in 1985, identified five elements that define authenticity in terms of the physical building, Jeremy Wells describes three more contemporary viewpoints of authenticity. Wells (2010) defines authenticity as what differentiates a historic building from a fake. It is both the fabric and experience of a building that contributes to its authenticity. Wells identifies fabric-based, constructed, and phenomenological authenticities as three types of authenticity. Fabric-based authenticity

is generally the most familiar to preservationists because it reflects the earlier preservation philosophy that was very curatorial in focus. Fabric-based authenticity relies on what was original to the building, including the five areas as identified by Tschudi-Madsen, material, structure, surface, form and function. Wells' second category, constructed authenticity, focuses on the ideas that were originally embodied during the construction of a historic building. Very little original material may be left, but the building as a symbol or testament to its era still remains as constructed authenticity. Wells' third definition of authenticity is phenomenological (experiential) authenticity. This definition seeks to invoke an experiential reaction when witnessing an historic building. While fabric-based and constructed authenticity focus on the building material and originality of it, phenomenological authenticity focuses on the personal experience to the site. This is an important approach that broadens how authenticity is being defined in the twenty-first century. Wells provides insight into areas of authenticity that are not solely focused on the originality of the materials, as was common during the early years of the preservation movement, but encompasses an array of aspects that affect the authenticity of a building. The acknowledgement that a building does not have to rely only on the retention of original building fabric to be authentic is a current philosophical understanding in preservation.

Moving away from the 'fabric-centered bias' that previously dominated the field is important for understanding the multiple dimensions of authenticity and requires a shift towards a 'values-centered' approach (Wells, 2010). A values-centered approach to preservation allows for a variety of meanings to be given consideration when determining



the authenticity of a building. Values-centered preservation utilizes more of a phenomenological (experiential) approach to authenticity since more attention is paid to preserving the inherent emotions conveyed in an historic building and to the values the community places on the building. Memories, ideas, and other social motivations are all priorities that drive the impulse to preserve the built environment (Wells, 2010). Values-centered preservation is unlike fabric-centered preservation, which focuses on the original fabric of a place. Values-centered preservation emphasizes a combined understanding of sites, accounts for all values of a site, is based upon a comprehensive knowledge of a site, and reveals gaps in the knowledge about the historic environment (Mason, 2006). These four benefits of values-centered preservation accentuate the importance of the approach in this research. It puts preservation in a social context and makes the researcher's work relevant to society and not just relevant to the researcher. Values-centered preservation "redefines the role of the preservation professional from directly characterizing significance to one in which the professional learns what is significant to a local population" (Wells, 2010, p. 39). This thesis considers both fabric-based and values-centered preservation approaches.

### *Integrity*

While authenticity can be categorized as fabric based, constructed, or experiential, a building's architectural integrity can be identified as a combination of the three. Both the original fabric and emotion has to be retained in some degree in order for the integrity of the building to remain. A building's architectural integrity as defined by the National

Park Service is the ability of a property to convey its significance (U.S. Department of the Interior, 1990). As with authenticity, integrity has many facets. The National Park Service identifies seven aspects of integrity, which include, location, design, setting, materials, workmanship, feeling, and association. While architectural integrity encompasses all of these aspects, the loss of one may or may not mean the loss of the building's integrity. Each of the seven identified aspects of integrity does not have equal representation and the importance of the retention of these varies from community to community. Since buildings vary from place to place, it is the preservationist's responsibility to determine which aspects have a greater significance that must remain in order for the building to remain significant. Knowledge of what contributes to a historic building's integrity is crucial.

The first aspect of integrity as defined by the National Park Service is location. Location refers to the place where the building was constructed and the context of its placement is crucial to its significance. For example, the placement of a school building in the center of a community is important because of the relationship established between the school and the people of the community. Design is the form, plan, space, structure, and style of a building. This includes organization of space, proportion, scale, technology, ornamentation, and materials. Not only does a building's design reflect aesthetics but historic function as well. Rather similar to location is setting. Setting refers to the physical environment of the historic building. The character of the place is considered to be the building's setting, which could include topographic features, vegetation, manmade features, and the relationship between buildings or other features.

The fourth aspect of integrity is material, which contributes to a property's sense of place and time. Original materials "reflect owner preferences, local availability of materials, and the building technology of the period" (Leimenstoll, 2009, p. 6).

Workmanship is also important to the contribution to a property's sense of place and time. Workmanship is the evidence of craft to a particular culture in history.

While the first five aspects of integrity have all been physical or tangible elements, the last two, feeling and association, are not. Feeling describes the effect that setting, design, materials, and workmanship can have. Association is defined as the link between an historic event or person and the historic property (U.S. Department of the Interior, 1990). These seven aspects play a role in determining a building's integrity and while all may not have been retained since the building was originally constructed, the retention of a majority of the aspects must remain in order for the historic building to continue to be historically significant.

### *Rehabilitation*

It is essential that what defines a historic building's authenticity and integrity is clearly understood before any work is done to the building. Identifying the arrangement of spaces, features, and applied finishes that are individually or collectively significant to defining the historic character of the building is important to retain and protect and should be given the most consideration in every preservation project (Jandl, 1988).

"Caution should be exercised in developing plans that would radically change character-defining spaces that would obscure, damage, or destroy interior features" (Jandl, 1988).

While an historic building can be preserved, rehabilitated, restored, or reconstructed, for the purpose of this research, rehabilitation is most congruous with the work that was done in each case study. Rehabilitation means taking a historic building and adapting it to fit current needs while still retaining the historic integrity. During any rehabilitation, the best way to preserve the building is to keep them in use (Feilden, 2003). The original use is generally the best option for rehabilitation because it conserves more original fabric since there are fewer changes that will have to be made (Feilden, 2003). When rehabbing an historic building, the Secretary of the Interior's Standards for Rehabilitation are the national guidelines used by preservationists. The United States Department of the Interior developed these standards in 1976 with minor revisions made in 1992. The standards emphasize retention and preservation of historic buildings through continued use. By continuing to occupy a building, repairs are generally made in a timely fashion keeping the building maintained, which leaves less risk of neglect and resulting major repairs. When repairs are needed, the Secretary of the Interior's Standards for Rehabilitation are used. They advocate repair over replacement.

Throughout the American preservation field, the Secretary of the Interior's Standards are widely accepted as basic tenets to be followed during any alteration to a historic building. These guidelines were established knowing that in order for historic buildings to be used continuously, some changes may need to occur. The ten standards are recommendations, not rules, which are applied to buildings listed on the National Register of Historic Places.

## *Evaluation*

One of the greatest preservation accomplishments of the past century has been the refinement of the process of evaluating the significance of historic resources (Abele, Gammage, Jr., 2000). To preservationists, significance is the term that is the filter through which we exercise professional judgment and is the framework for every evaluation. “Using a prescribed rationale that is based on consistent criteria and methods to determine what to preserve has given the preservation movement credibility” (Abele, Gammage, Jr., 2000, p. 2). Much of this credibility has come through the establishment of the National Register of Historic Places. The National Register of Historic Places is a list of properties that are deemed significant in American history, architecture, archaeology, engineering, and culture. Being listed on the National Register certifies that the property has significance. Properties that are eligible to be included are districts, sites, buildings, structures, and objects of national, state, and local importance. The National Register of Historic Places has had a profound impact on historic preservation by establishing a criterion to assess the significance of historic properties (Stipe, 2003). This allows for historic properties to not only be identified but also scrutinized in order to determine their significance to the country, state, and/or local communities.

Buildings outlast the people that built them and they evolve as they are continuously inhabited but a building can retain a memory of its previous function, which is engrained within the structure (Brooker & Stone, 2004). As has been previously stated, there is a hierarchy in historic preservation that emphasizes the exterior of the building over the interior and the primary spaces over the secondary. During

rehabilitations, changes that occur to the more public areas, such as exteriors and lobbies, should be more sensitively approached than less public spaces (Jandl, 1988). While there are a variety of resources that discuss the approaches to preserving the exterior of historic buildings, Brooker and Stone (2004) provide a major contribution to the field of historic preservation with their analysis of approaches to rehabilitations. They explicitly highlight tactics that designers can employ to achieve one of three design strategies in an historic building. Unlike many resources that focus on exterior retention, Brooker and Stone thoroughly look at alterations to the interior of a historic building and the relationship that is established between the new and old designs.

When designing a building, architects will use a strategy that will inform and order the building but when reusing a building, the most important factor in the design is the original building and the relationship between the new and the old. The new designs could not exist without the original building. By understanding how the new and the old reside, Brooker and Stone identified three strategies that provide the analysis of types of building reuse (Brooker & Stone, 2004). These three different strategies, or design approaches, to rehabilitating a historic building are intervention, insertion, and installation. The degree in which decisions are made regarding the relationship between the new design elements and the original building determines which strategy is being applied. Intervention is a process in which the new and the old become intertwined. The alterations to the existing building are often small and tend to relate to the original building (Brooker & Stone, 2004). The original building inspires the changes made and the form of the building will dictate the way it is reused when intervention is the strategy.

The original building will not only determine how it is used but the position of the spaces and how the spaces relate to one another in size and scale as well. Any new designs that are introduced to the existing building will be a secondary focus with the existing building always remaining the primary focus. By contrast, in the insertion strategy the dialogue between the new elements and the historic elements is more obvious and balanced (Brooker & Stone, 2004). With insertion, the new is visually differentiated from the old and exists independently. When insertion is the strategy applied in a rehabilitation design, the style, materials, and character of the new design is distinctively different from the old. The final strategy is installation, which is the placement of elements within the existing building envelop. The new and the existing exist independently from one another and while the new elements are placed within the existing building, if they were to be removed the building would return to its original state (Brooker & Stone, 2004).

In order for the strategies to be achieved, Brooker and Stone identified six design tactics. The tactics that are employed during the rehabilitation of a building “can be seen as the manipulation of the elements or details in support of the overall strategy” (Brooker & Stone, 2004, p. 146). The tactics include: plane, object, light, surface, opening, and movement. Plane defines and organizes space and can be horizontal or vertical, permanent or temporary. Walls, floors, and ceilings are planes that define the interior of a building. Object can manipulate space, movement, and visual direction while establishing rhythm. An example of an object is a piece of furniture. Furniture establishes human scale and use since it supports the function of the building. The

placement of objects also directs movement throughout the space. Light, whether natural or artificial, can direct movement, accentuate objects, and control space and form.

According to Brooker and Stone it is the most important element used for understanding space. Natural light reveals seasons of the year and daily weather and can be manipulated to illuminate certain spaces while artificial light is used to supplement natural light. Surface is a tactile element that establishes a relationship between a person and the building because it receives the most contact. Decisions made by designers of specific materials and textures to be used during rehabilitation can create identity and meaning to the building. The properties of materials often determine the room usage, just like furniture. Opening provides orientation and direction, admit light, create views, and establish relationships. They can be ornamented or plain. Openings, such as a door indicates the transition from one room to another while a window opening admits light and allows for views. Movement or circulation is generally vertical or horizontal and is conducted through stairs, lifts, ramps, or corridors. The ways in which these six tactics are manipulated determines which of the three strategies has been used during the rehabilitation. Understanding which strategy (intervention, insertion, or installation) has been used provides preservationists a key when analyzing what has been done to an existing building.

While Brooker and Stone's design strategies identify how a historic building has been reused and their tactics provide ways in which the strategies can be achieved, the eight criteria identified by Leimenstoll (1998) provides a methodology for evaluating the impact these changes can have to the architectural character of historic interiors. Even



though the National Park Service identified seven criteria of integrity, the eight criteria as identified by Leimenstoll will be used because these criteria are more specific to the historic building's interior. The eight criteria are form, proportion, rhythm, scale, light, materials, finish, and detail (Leimenstoll, 1988). The following definitions for the eight criteria are derived from Leimenstoll's article.

Form is the three-dimensional shape or geometry of an interior element, space, or spaces. Form is what defines an area, whether that is a building as a whole or an individual room. Proportion is closely related to form. It refers to the relationship of the height to both the width and depth of a given form. Spaces tend to have a clear vertical or horizontal orientation. In terms of rehabilitation it is important to remember that the changing of any proportions can alter the historic interior significantly (Leimenstoll, 1988). In terms of rhythm, this criterion refers to the repetition of interior elements or interior spaces. Rhythm helps to establish organization within the historic interior space. Scale means the size of interior details, elements, spaces or a series of spaces in relation to the human body.

Whether light is present naturally, artificially, or in combination, it contributes to the overall significance of the interior space as well. Altering access to light through reducing the size of the windows, the number of windows, or tinting the windows will affect the interior. Even the conversion from one type of light bulb to another can alter the space. The next criterion, material, greatly contributes to the character and significance of historic interiors. New materials will often be introduced during rehabilitations causing the original materials to be covered or replaced and therefore

affecting the character of the building (Leimenstoll, 1988). Related to material is the finish criterion. Finish covers both texture and color of the materials and is the final surface that people see and interact. The last criterion is detail. Details in a historic interior are the decorative elements that often reinforce the proportion, rhythm, finish, and scale of an historic interior (Leimenstoll, 1988). While there are several ways to define and analyze authenticity and integrity, Brooker and Stone's design strategies provide a current preservation philosophy and Leimenstoll's eight criteria of integrity specifically aid in the identification of alterations made to historic interiors. Both Brooker and Stone's strategies and Leimenstoll's criteria will provide the methodology for the evaluation of the alterations to the historic buildings in this research.

### **School and Community Involvement**

Schools can have significant influence on the people who attend them. According to Hallinan (1987) there are three aspects of schools that affect the learning process of students; "the school climate, the community or network of persons connected to the school, and the larger society in which the school is located" (p. 8). The community surrounding the school has a very strong influence on student learning. Children socially are better motivated to learn when supported by the community (Lee & Atkinson, 2008). With community involvement and support, students generally achieve better results in school. There are also advantages for the community to become involved with schools. Schools anchor communities and when communities become involved there are increased

opportunities for education and training that could lead to increased employment throughout the community.

Both historic and present-day schools form a significant part of the local community. Schools can be a place of community identity, cohesion, and character (Olliff, Zuccherelli, & McEvoy, 2010). Another benefit for community involvement in schools is that there is an increase in social amenities, which provides more interaction thereby enhancing the surrounding community. Neighborhood schools are said to "foster a better learning environment and higher student achievement, promote neighborhood cohesion and pride, discourage sprawl and preserve farmland, lower busing costs and student parking requirements, and encourage children to walk or bike to school" (Anon, 2003, p. 10).

The interaction of school and community provides benefits not only for the community but for the school as well. Community involvement generally makes children more willing to learn, reflects the society that surrounds the school, brings cooperation with parents and teachers, reduces student behavior problems and increases student achievement. Neighborhood schools with tight surrounding communities offer these benefits unlike schools with more sprawled communities. As will be discussed later, historic schools were built in the heart of communities and were the iconic buildings for the surrounding neighborhoods. There are benefits for having a school built at a central location and since many historic schools were built centrally, their continued use is solidified by the benefits they create. Centralization of schools was a part of the

educational history of America. As education evolved throughout this country's history, so did the architecture.

### **Education Curriculum and Theory of the 1920s**

As education evolved throughout the late 1800s, the diversity of subjects being offered in newer curriculum required school buildings to be constructed with these certain needs in mind. The evolution of the schoolhouse eventually led to schools that resembled the buildings being studied in this research. "By 1900 high schools were offering college preparation courses, vocational shops, and some clerical-related subjects," and by 1917 vocational training programs were encouraged by the federal government (Graves, 1993, p. 26). In 1907 Theodore Roosevelt said, "Our school system is gravely defective in so far as it puts a premium upon mere literacy training and tends therefore to train the boy away from the farm and the workshop." Roosevelt was advocating vocational education in order to prepare students to work after completing high school. Prior to 1917 about 164,000 students were enrolled in vocational schools throughout the country, and by 1936 the number of students in vocational schools had risen to 1,382,000 (Engelhardt, Engelhardt Jr., & Leggett, 1949). Vocational education covered a variety of pedagogical activities, such as preparing students for occupations in the manual trades, business, farming, and home making (Krug, 1964). Vocational studies were provided in several of the schools in this research. Some of the schools were built with shop wings for vocational education while others built vocational buildings just a few years after the original construction.

Vocational education was not the only major educational influence of the early 1900s. At the beginning of the twentieth century progressive education was beginning to gain a supportive group. John Dewey is considered the “Father of Progressive Education” and he called for a transformation in schooling. “He had inspired a movement to establish new schools that would be democratic rather than authoritarian, that would make learning meaningful and pleasurable by focusing on the needs and interests of children” (Zilversmit, 1993, p. 1). Progressive education reached its peak of influence in the 1920s and the 1930s. The progressive educators of that time were aiming to transform education in both public and private schools.

A form of educational theory that developed out of the progressive educational era was the Dalton Plan. The Dalton Plan sought for culture and experience in the classroom, which could only be achieved with a classroom that functioned like a community. According to the Dalton Plan, a classroom should have “a community whose essential condition is freedom for the individual to develop himself” (Parkhurst, 1922, p. 18). Freedom was the first principle of the Dalton Plan that wanted students to feel free to “continue his work upon any subject in which he is absorbed without interruption, because when interested he is mentally keener, more alert, and more capable of mastering any difficulty that may arise in the course of study” (Parkhurst, 1922, p. 19). Specifically, a student should be able to work at his own rate of speed. The second principle was co-operation stating that not only should students work individually but they should be able to interact within a group too.

The Dalton Plan sought to develop a student's character, which would help him or her in school and work. According to Parkhurst (1922), the focus in the 1920s was too much on curriculum and not enough about students. The Dalton Plan "is a plan through which the teacher can get at the problem of child psychology and the pupil at the problem of learning" (Parkhurst, 1922, p. 27). It could be applied to student learning and to the arrangement of any school.

College prep, vocational education, progressive education, and the Dalton Plan were popular educational trends during the early twentieth century and could affect the way courses were taught, what was being taught, and the organization of a school. But as these trends were circulating, an important milestone in educational history was underway. There were numerous schools of various sizes throughout the country with differences in student education. In order to try and create cohesion amongst schools, a consolidation movement began.

### **School Consolidation Movement**

Consolidation refers to any type of school unification, reorganization, or merger (Bard, Gardener, & Wieland, 2006). American school consolidation began as early as the mid-1800s and was thought to provide students a more thorough education by grouping students in larger schools instead of separating them in smaller ones. The rise of industry in urban areas contributed to the school consolidation movement. With the invention of the automobile, along with the paving of roads, students could travel longer distances in shorter amounts of time, which decreased the need for many one-room schools (Bard et

al., 2006). School reformers felt that an industrialized society required all schools to resemble one another, and that larger schools were seen as more economical and efficient (Kay, Hargood, & Russell, 1982).

The consolidation movement affected all schools in this research sample. Each of the schools was constructed as large public buildings that stood as an icon for the surrounding community. While each building was designed with different design aesthetics, they all represent the collective ideal that was the consolidation movement.

### **History of High Schools in the U.S.**

The development of high schools is an American invention (Goldin, 1998). At the turn of the twentieth century the modern American high school was born and continued to grow during the following decades. The growth that occurred from 1910 to 1940 was particularly important to the increase in U.S. educational achievements during the century (Goldin, 1998, p. 349). From 1910 to 1940, enrollment in secondary schools increased in the United States, with the main period of growth occurring between 1920 and 1935. During the three decades following 1910, high school enrollment rose from 18 percent to 73 percent while the graduation rate rose from 9 percent to 51 percent. Before 1910, one of the main reasons for students to attend high school was to gain entrance to college (Goldin, 1998). The curriculum during that time included Latin, Greek, French or German, English, history, mathematics, and science (Goldin, 1998). From around 1910 to 1940 there was a shift in the reason students attended high school. During that time, students would enter high school to seek an education that would take them directly

to an employment opportunity. This was achieved primarily through greater access to vocational education.

High schools located in city settings were four times larger than rural high schools. “The automobile, the school bus, and improved roads were of critical importance to secondary school education in America and may account for why the movement took off so rapidly in the 1910s and 1920s” (Goldin, 1998, p. 368). Increasing enrollment size called for more focus on the curriculum as well as the architecture of the school building.

### **1920s School Designs**

During the early part of the twentieth century, the nation was transitioning from a conservative rural state to an urban, industrialized, corporate society. Architecture from this period was being shaped by national influences. North Carolina leaders looked to national sources to seek inspiration to establish new institutions, strengthen old ones, expand cities, and enhance the state’s cultural identity. Just like the rest of America, the early twentieth century in North Carolina was the golden age for architects and planners (Bishir, 1990). In the early twentieth century, North Carolina employed prominent architects for large projects since these projects were becoming more numerous and elaborate during this period (Bishir, 1990, p. 428). Regional architecture began to dissipate while a national form developed.

School design responded to the developments in pedagogy and public health through modifications in the plans, classrooms, corridors, and ancillary spaces such as



gyms and cafeterias (Engelhardt et al., 1949). With educational design beginning with the one-room schoolhouse, this building type evolved in the late eighteenth century but was still common through the early twentieth century. During the Industrial Revolution, several factors rendered the one-room schoolhouse ineffective. Theories about education progressed as the courses taught were diversified, the approach to teaching changed in theory and in approach, and views about children in general changed. The numbers of students increased when obligatory education was instituted (Prudon, 2008).

Before World War I, architects were generally not often used in designing school buildings probably since the majority of school buildings were locally built schoolhouses (Prudon, 2008). The rise of progressive education stimulated the perception of education as an opportunity for social and economic advancement and became a subject of interest to modern architects of the time (Prudon, 2008). Urban school buildings built after 1900 but before widespread electrification were generally designed as large, multistory buildings in the E-, U-, H-, L-, and T-shape (Engelhardt et al., 1949). Both the E- and U-shapes were designed in the early 1900s to maximize the amount of natural light in the classroom. But no matter how effective the plan of the building, if not accompanied by a pleasing exterior, it would soon lose its prestige (Donovan, 1921). A pleasing and attractive exterior was necessary because the general public viewed it the most, so a grand front façade made an important statement to the community. If the public appreciated the school's architecture, the prestige was upheld. The grand 1920s architecture sold education to the public and established the school's importance in the community.

During this time when many new large schools were being built, it was common to use guidelines that helped establish design unity. One such book of guidelines was *Healthful Schools: How to build, equip and maintain them* written in 1918 by Ayres, Williams, and Wood. The authors described how to construct healthy schools. According to these scholars, a school should be within reach of all students; students should not have to walk more than a mile and a half to school, but if the school is located at a further distance, some means of transportation should be provided; the school should also be near but not too close to a public highway; if a building were too close to a road dust and noise would then become an issue.

In terms of space, no set number was prescribed in the guideline because scholars thought that each school's needs would vary. While no set number of acres was given, they did include some guidelines to consider. For example, there should be plenty of playground space when planning schools with younger students. Depending on the activities, the area allotted for each student ranged from forty to two hundred square feet (Ayres, Williams, & Wood, 1918).

Lighting was another critical issue when designing schools in the 1920s. Ayres, Williams, and Wood wrote that the school should be placed in such a way as to maximize sunlight. Also, each student should be able to see the sky while sitting at his or her seat, and no tree or building should be near the school's windows (Ayres et al., 1918). Large trees or buildings that were close to school windows would block needed natural lighting for students.

The recommendation was also made that no matter the location an architect with school design experience should be hired to design each school (Ayres et al., 1918). The plan of the school should have a beautiful outline, be simple to construct, be adequate for education, and should be designed so that “new portions can be added without impairing the utility or beauty of the old” (Ayres et al., p. 14). The school building itself should never be more than two stories high which allows for easier access to each floor.

With the changing theories of education in the 1920s, what was once the norm in school design was about to change. According to Aryes, Williams, and Wood (1918), fixed desks should not be placed in classrooms. Portable furniture was favored over stationary furniture, as this allowed the students and teachers to arrange the desks for the needs of varying activities of learning. The size of the classrooms should vary as well, especially in high schools. Variety in room sizes allowed for diverse activities.

Auditoriums should be located on the first floor with exits that lead directly outside.

Gymnasiums should be designed in a way to receive plenty of light and ventilation.

Libraries were beginning to not be held solely in public buildings in the city but to be placed in schools during this time period. If a school were fortunate enough to have a library, there should be spaces for students to sit and study. The lunchroom should be

easily accessible as well. As for the school’s offices, they should also be easily

accessible with the principal’s office near the main entrance (Ayres et al., 1918). One of

the ways beauty in school architecture was attained was “through the development of

balance and proper relationship of the parts to the complete structure” (Engelhardt et al.,

1949, p. 35). The 1920s high schools were designed with influences of Classical symmetry.

### **Current School Designs**

Just as it was during the construction of schools in the 1920s, there are current guidelines for constructing current school buildings. As stated earlier, “The design of educational facilities has a profound impact upon how students learn and on how well they serve the communities in which they are located” (Kirk & Ward, 2000). Schools built prior to World War II employed daylighting and natural ventilation. By the 1960s, the benefits of daylighting and natural ventilation seemed to have been forgotten, perhaps due to the widespread introduction of air conditioning and fluorescent lighting. Current school designs focus on smart growth and sustainability, but are still influenced by some of the design characteristics of pre-World War II school designs (Linn, 2011).

Smart growth is about working together to rebuild inner cities, where land has already been developed and infrastructure already exists. Smart growth has a number of principles, some of which include: mixing land uses, taking advantage of compact building designs, walkable communities with a strong sense of space, and encouraging community collaboration. Sustainability goes hand-in-hand with smart growth schools. Sustainability seeks to reduce congestion, sprawl, pollution, and resource overconsumption (Kirk & Ward, 2000). Some communities believe that smart growth and sustainable schools will provide a better learning environment for students. Considering that a major focus of smart growth is the utilization of existing infrastructure

for water, sewer, natural gas, road systems, and public transportation, these types of urban schools are ideal.

While smart growth and sustainability are big issues, there are many other aspects involved in current school designs. In the North Carolina Facilities Guidelines (2010) there are a number of suggestions to help design school facilities. To evaluate existing or potential school sites the following should be evaluated (Harrison & Atkinson, 2010):

- Size (number of acres)
- Road frontage (two or more roads are best)
- Shape (rectangular 3:5 ratio preferred)
- Topography/Drainage (usable acreage)
- Access (to separate traffic types on site)
- Traffic (buses; cars; pedestrians)
- Soil conditions (foundations; waste disposal)
- Plant life (trees; bushes)
- Noise/Air pollution (airport; traffic; industrial)
- Utilities (availability)
- Television signals (ETV; school TV)
- Security/Protection (emergency access; lighting)
- First cost (cost per acre)
- Developed cost (actual cost).

The guidelines also specify classroom sizes. For high school grades 9 through 12, there should be a net square footage of 750 to 850 per classroom. Depending on room size the ceiling heights range from nine feet and four inches to ten feet. In regards to windows, each classroom should have windows for rescue, light, ventilation, and psychological reasons (Harrison & Atkinson, 2010). Hallways should be twelve feet wide to allow for less congestion. Classrooms can have a maximum of thirty-two students per teacher. The document also states requirements for specific room uses such as science labs,

resource, musical, art, theater, and dance rooms, media centers, gymnasiums, administration offices, cafeterias, and field houses.

Not only do the guidelines specify space allotments, but material choices as well. The use of wood for any structural purpose is discouraged. A variety of ceiling materials are recommended including 2' x 2' lay-in ceiling panels, gypsum board, and impact-resistant ceilings. Masonry walls are preferred over gypsum board for maintenance reasons. Flooring materials are not mandated in the guidelines. The guidelines recommend that fluorescent lighting should be used for general lighting while incandescent lighting should only be used for accent lighting. Much like the book written in 1918 by Ayres, Williams, and Wood, the School Facilities Guidelines provide architects and school boards with a scope of areas to consider before designing and constructing schools

### **New Construction Implications**

Historic schools were generally located at the center of the community. A prominent location was chosen for visibility and also easy access of the community to the school. Today historic community-centered schools offer numerous benefits. They keep travel distances short which helps the environment and encourages walking or biking to school which assists in creating healthier families. Community-centered historic schools also encourage close ties with community members and increase property values. Utilizing these schools will also save on construction and operating costs (*Community-Centered Schools Offer Numerous Benefits*, 2010). The disadvantages of not having a

community-centered school include the following: more cars driving children back and forth; fewer opportunities for physical activities because fewer kids can walk or bike to school; weakened community and school connection, and decreased property values. The decrease in property values occurs when an existing school is abandoned and a new school is built farther away, leaving an empty building to sit. Consequently, taxes increase to pay for a new school (*Consequences of Distant Schools*, 2010).

If an existing school is utilized, some renovations will likely be necessary. Renovation of schools creates more local jobs than new construction (*Our Position on Community-Centered Schools*, 2010). When the labor used to renovate schools is local, that means that money will stay in local economies, thereby creating a more powerful economic stimulus (*Our Position on Community-Centered Schools*, 2010).

If a new school is constructed, urban sprawl is usually generated. In some states, newly constructed schools are built on 10 to 60 acres of land (McKee, 2001) and lose community involvement because they are constructed on the peripheries of communities. In turn, students must rely on motorized transportation instead of walking or biking to school, whereas before World War II, most students would walk or bike. Since then there has been a push for larger schools on larger sites and in urban settings the only option is to build on open land around the edges of the city.

According McCann and Beaumont (2003), a generation ago 70 percent of students walked or biked to school. Currently 80 percent of students use motorized transportation. Instead of building a new school on the edges of communities, school boards should consider utilizing historic schools, building a new school in an existing

community, or retrofitting other facilities into schools.

North Carolina does not specify a set acre requirement for high schools. Instead of mandating a number, a number is recommended. For high schools, 30 acres for the school plus one acre for every 100 students is recommended (National Trust for Historic Preservation, 2003). This number is mainly for rural or suburban areas. Urban areas may use smaller sites if the design team uses alternative solutions for parking and other issues that require large amounts of space. By utilizing existing schools, we slow down the ever-expanding city fringe. There are benefits to reusing historic school buildings and many of the design elements of historic schools are still ideal in current design practices.

### **Reuse of Historic Schools**

Reusing historic schools allows for vegetation, topsoil, streams, hills, marshes, farmlands and other undeveloped land to be kept pristine (Forrant, 2007). Heimer (1977) states that pre-WWII schools are better for reuse because their mass and institutional feel allows for more reuse options. Heimer goes on to discuss some of the challenges of utilizing school buildings. Along with Heimer, Taylor (1992) discusses some of the advantages and disadvantages of utilizing historic schools. From 1900 to 1925, the "flexible school plan" was developed so that the school could be used for community meetings and activities. This feature also eases today's reuse efforts. Natural lighting is abundant in these schools because the time period in which the buildings were built used natural light as the primary source of light. Ventilation systems were common and egress was also a primary concern in the school designs because fires were a serious concern



supporting easier retrofitting to today's needs when compared to other building types. These are some of the advantages of using schools built during the early twentieth century. Some limits that arise with reuse of schools include compliance with current zoning codes, building codes, and handicapped accessibility.

Many secondary schools constructed during the early twentieth century still remain in use. The building's plan was usually devised as a reaction to the educational theories of the time and the basic elements of maximizing natural light and air are still important to modern schools. Classrooms, hallways, offices, gymnasiums, laboratories, workshops, and studios were designed into the school in the early twentieth century and are still designed into present day schools.

Since historic schools are more integrated into the community than most present-day schools, many of the existing historic school sites are more accessible to the surrounding community (O'Donnell, 2010). "With growing concern about sedentary lifestyles and childhood obesity, a site that encourages more walking or biking can provide life long benefits" (O'Donnell, 2010, p. 16). The proximity and physical convenience of our existing historic schools supports the idea that schools are centers of the community. All of these connections make the early twentieth century school building still relevant for preservation and continued use.

### **N.C. Schools' History**

From 1880 to 1920, North Carolina built more than five thousand schoolhouses (Leloudis, 1989). The state by then had professionalized teacher training and had created

a system to administer the instruction of students. By 1925, one-room schools had been replaced in almost all communities. Once a defining feature of the rural landscape, they accounted for less than a third of all the schoolhouses in the state and enrolled an even smaller amount of students by this time (Leloudis, 1996). In place of the one-room school, was the city school made of brick and stone.

North Carolina in the 1910s and 1920s invested large sums in public education, including both consolidated high schools and graded schools (Bishir, 2005). On average North Carolina schools of the 1920s cost around \$18,000. By calculating the cost of inflation, \$18,000 has the same buying power as \$227,314.74 in 2010 yet the average high school construction cost in North Carolina in the twenty-first century is \$32,811,163 (“Average School Cost,” 2010). For example, in 1929, the budget for Greensboro (Grimsley) Senior High School was one million dollars. One million dollars in 1929 was something unheard of at the time and has the same buying power as \$12,628,596.49 in 2010. The amount of revenue spent on the development of schools was an unprecedented sum, and has continued to increase.

By the late 1920s there was a significant boom period in North Carolina in the development of large, city high schools and also many rural high schools. These buildings were becoming multiuse complexes with gyms, auditoriums, and other spaces that truly made them community facilities (Bishir, 1990). With the increased state funding, and rapid urban growth, educational facilities in North Carolina were a showplace on par with other educational facilities around the country. Almost every city of significant proportions in the state built a new high school between the end of World

War I and the early years of the Depression (Harris, 1990). Some of the most distinctive schools built during this time frame have been listed on the National Register of Historic Places, thereby solidifying the inherent importance of the structure to the history of the surrounding community, North Carolina, and the country. There are approximately 127 school buildings listed on the National Register in North Carolina including schools remaining as schools facilities and those that have no current use. Of the 127 listed, there are approximately 14 schools listed on the National Register that were constructed during the 1920s that remain as schools (obtained from the North Carolina Department of Public Instruction).

### **Historic Designation**

To preserve a site that is significant to a local population, historic designation has become an important tool. Historic designation aids in preserving center city neighborhoods and stimulating economic development. Designation of historic properties usually comes from designation of individual properties or designation of neighborhoods (Coulson & Leichenko, 2001). Designation can occur through the local, state, or federal government. Local significance and Federal designation is something that all six high schools have in common. All high schools included in this research are listed in the National Register of Historic Places. A National Register Nomination includes a survey of the site and must make the case for significance of the property. Current conditions, archival and current photographs are included. Summaries of the

information from the National Register nominations on the six historic North Carolina high schools follows.

### *Roanoke Rapids High School*



Figure 1. Roanoke Rapids High School. Photo by author.

Roanoke Rapids High School was designed by Hobart Upjohn and was commissioned and supported by textile company president, Samuel Patterson. The school was completed and opened in 1921. “When the school opened it had an auditorium, indoor track and pool, and gymnasium. Its auditorium was claimed to be the best between Washington and Atlanta” (Bishir, 1990). New York architect, Hobart B. Upjohn, designed the Tudor Revival styled Roanoke Rapids High School in a T-shape. The high school opened on September 16, 1921, with 58 teachers and 1457 students. The community viewed the new facility as a monument and testimony to education. Material changes have occurred but little extensive changes have affected the integrity of the building (Taves, 1988).

*Richard J. Reynolds High School*



Figure 2. Richard J. Reynolds High School. Photo by author.

R.J. Reynolds High School was built between 1922 and 1924 in Winston-Salem. Both the high school and auditorium were designed in the Neo-Classical Revival style and are among the most significant high school and cultural facilities built in North Carolina during the first half of the twentieth century (Dull, 1990). The complex consists of five buildings constructed from 1922 through 1968. The powerhouse was built in 1923, as well as the gymnasium, but the gymnasium had major additions in 1952. A girl's gymnasium was constructed in 1968 and a History building built in 1968 contains both classrooms and cafeteria. The Auditorium was also built between 1923 and 1924. Architect Charles Barton Keen designed the high school, powerhouse, gymnasium, and auditorium. Katherine Smith Reynolds requested Charles Barton Keen of Philadelphia to design the buildings using Thomas Jefferson's plan for the University of Virginia. The interior is amazingly unaltered in many of these buildings (Dull, 1990).

The construction of Reynolds High School and Auditorium was due to three key factors: the increased importance of education in North Carolina during the early twentieth century, the rapid growth of population and wealth in Winston-Salem, and the patronage of two of Winston-Salem's most prominent families (Dull, 1990). Like Asheville High School, the school's educational curriculum included vocational education. The curriculum at Reynolds high school was equally focused on traditional subjects and vocational training. Educators and locals praised the system as an innovative system for the city's young people.

With the erection of James A. Gray High School in 1930, John W. Hanes High School in 1930, Simon A. Atkins High School in 1931, and R.J. Reynolds High School in 1923, Winston-Salem had the best secondary education system in the South (Brownlee, 1977).

### *Asheville High School*



Figure 3. Asheville High School entrance. Photo by author.

Asheville High School located in Asheville, North Carolina opened in February of 1929. Douglas Ellington, a renowned local architect, designed Asheville High School to reflect the new educational theories of the 1920s (Bowers, 1996). He was extremely influenced by vocational education. Dr. Nickolaus Louis Englehardt's *A School Building Program for Cities* inspired Ellington's design and Englehardt was an advisor to Ellington during the design process. "The association between Englehardt and Ellington helped to ensure that the new high school would be a model facility in terms of architecture and educational offerings" (Bowers, 1996, p. 17). When constructed, Asheville High was the only fireproof building in the city (Bowers, 1996). The school allowed both boys and girls to have vocational opportunities.

### *Greensboro (Grimsley) Senior High School*



Figure 4. Greensboro (Grimsley) Senior High School. Photo by author.

A study conducted in 1920 by Drs. G. D. Strayer and N.L. Englehardt indicated that all the city school buildings in Greensboro were substandard. With the help of increased state funding, Greensboro citizens began a major school-building program (Byrd, 1996). The land for the new Greensboro high school was purchased in 1927. It was a 129-acre tract of land on Westover Terrace. At the time, many citizens thought the location was too far in the country but presently it sits almost in the center of Greensboro (Byrd, 1996).

When Greensboro Senior High School opened in 1929, it was called Greensboro's million-dollar high school. Currently, there are a total of twenty-three buildings located on the Greensboro (Grimsley) Senior High School campus, formerly named Greensboro Senior High School in Greensboro. The main building, old science building, and the cafeteria were designed by architect Charles C. Hartmann and were the first buildings to



open in 1929. The campus resembles a small college more so than a high school because the school board had decided that instead of having one large building, the high school should be composed of several separate buildings. The construction of the school was something that the entire community talked about.

Noted Greensboro architect, Charles Hartmann, initially designed six buildings for Greensboro Senior High School. By 1929, inflation only allowed for the construction of three buildings. The Great Depression did not stop the high school's development completely. The high school opened in 1929, but the campus continued to expand. The expansion eventually led to the fulfillment of Hartmann's original design intentions (Phillips, 2005).

Once Page Senior High School opened in 1958, discussion began as to whether or not Greensboro Senior High School's name should be changed. Effective July of 1962, the school board decided to change the high school's name to Grimsley Senior High School (Byrd, 1996). Grimsley High School is named in honor of George A. Grimsley (1862-1935) who served for twelve years as the superintendent of Greensboro City Schools. George Grimsley encouraged teachers to assign home reading, have open discussions in the classroom, and to have students write essays at school in order to see how well they learned their lessons (Arnett, 1973).

*James Benson Dudley High School*



Figure 5. James B. Dudley High School entrance. Photo by author.

Dudley High School, like Greensboro Senior High School, was designed by noted architect Charles Hartmann in Greensboro. The Classical and Gothic Revival styles influenced Dudley High School's architecture (Martin, 2003). Like Greensboro Senior High School, Dudley High School opened in 1929 as part of a citywide education campaign. "James B. Dudley Senior High School holds local significance in the areas of education and black ethnic heritage for its role in the development of black education in Greensboro in the early twentieth century" (Martin, 2003, p. 8). Dudley High School was the first high school for African-Americans in Greensboro and the first fully accredited public high school for African-Americans in North Carolina (Bethea, 2005).

James B. Dudley High School was named in honor of James Benson Dudley, who was named after Governor Edward B. Dudley. Governor Dudley was responsible for urging the establishment of training schools for teachers, building public schools for

students, and electing a state school superintendent. James B. Dudley was unanimously elected the second president of the Agricultural and Mechanical College at Greensboro. The High School was named after James B. Dudley for his strong educational leadership (Arnett, 1973).

Since Dudley High School first opened in 1929, it has seen its fair share of challenges. Probably one of the most controversial was when the Guilford County School System tried to tear the historic building down. While the interior of the main building had seen several renovations, the exterior façade maintained all of its architectural integrity since no major structural changes had ever occurred (Bethea, 2005). Talk of a new main building for Dudley High School ignited a highly controversial debate in 1998. There was argument on the side for demolition and on the side for preservation. The group of people on the side of preserving the building fought hard and wanted at least part of Dudley's heritage to be preserved (Bethea, 2005). Finally, in 2001, after a long debate the school board voted 10 to 1 to renovate Dudley High School.

*Needham B. Broughton High School*



Figure 6. Needham B. Broughton High School entrance. Photo by author.

In 1924 a ten-acre tract of land was bought for the new high school. Needham B. Broughton High School was a half a million-dollar structure in 1929 (Harris, 1990). Local architect, William Henley Deitrick designed the award-winning Needham B. Broughton High School in the Italian Lombard Gothic style. In 1928, Deitrick won a competition to design Broughton High School. During the course of Deitrick's career, he designed more than 125 public school buildings but is best known for his works in Raleigh. The American Institute of Architects jury awarded Broughton the outstanding school prize in 1930 (Harris, 1990). The high school opened in September of 1929. Needham B. Broughton High School was named in memory of Needham B. Broughton by the request of a number of citizens. Mr. Broughton was remembered as having fought for an adequate school for Raleigh in the late 1880s (Barbee, 1943). The original high school was H-shaped with a gymnasium and auditorium wings. "The interior of

Broughton remains little changed and retains its original plan and finishes” (Harris, 1990, p. 1). When the school opened there were 35 teachers and 650 students (Harris, 1990). For years the curriculum was in the form of an activity program, which provided work based on student interests. Over the years as more students began entering college upon graduating high school, the curriculum transitioned to college-prep.

Once completed in 1929, Broughton included an H-shaped classroom and office block, gymnasium and auditorium wings, and a pair of rear stair towers. As of 1936, Broughton High School was three-stories with twenty-nine classrooms, a commerce department, an acoustically treated music room, theater, science labs, a library with 5,000 volumes, gymnasium, auditorium, cafeteria, four offices, a teachers’ room, and storage spaces (Barbee, 1943). One of the most significant tragedies to occur to the building was a fire in 1969. The fire destroyed the interior of the auditorium, and thus the auditorium had to be completely renovated. Since the fire, both the auditorium and gymnasium wing windows were filled with brick.

While this chapter provided the historical context needed to understand this research, the following chapter will detail the specific methods that were used to reach the stated research goals.

## CHAPTER III

### METHODOLOGY

This study investigated how historic school facilities can be altered to meet ever evolving educational needs without sacrificing their distinctive historic character. The researcher used a purposeful sample of six case studies to understand the impact that alterations to the building exteriors and interiors, campus expansion, and the introduction of technology had on the historic character of the schools. Through archival research, visual analysis, and field visits, the researcher sought to identify commonalities, as well as differences, in the alterations made since the schools' construction dates.

#### **Sample Selection**

The purposeful sample of case studies was derived from a list of every North Carolina school building and addition built prior to 1940 that still remains an educational facility as identified by the North Carolina Department of Public Instruction (D.P.I.). In total, including new schools and school additions, there are 276 buildings that were built before 1940 that are still currently being used as schools in North Carolina. Of the list of 276, there were approximately 209 new main school buildings that were built before 1940 still being used today. Since the study focused on schools from urban settings because of research indicating greater architectural focus and financial resources were given to city schools, the database was narrowed to include only those buildings

located in cities in North Carolina. Once revised, the number of city schools built prior to 1940 still in operation totaled 48. The list was narrowed once again for the importance of the site to the community, state, and/or country by including only properties listed on the National Register of Historic Places. Inclusion on the National Register was important to this research because it justifies the significance of each building and was an exceptional resource regarding the history of the schools. Out of the 48 schools, 13 were listed on the National Register of Historic Places. The database was narrowed further to include only facilities from the 1920's, due to research indicating that this was an unprecedented time of growth in the construction and enrollment of schools, particularly high schools. This narrowed the results to six schools geographically dispersed across the state.

Researching buildings amongst a selected sample from across the state would illustrate that similarities in characteristics and renovation decisions were indicative of a statewide pattern and not an isolated incidence within a certain region in the state. The six schools that remained from the original list of 276 included:

- Roanoke Rapids High School,
- Richard J. Reynolds High School,
- Asheville High School,
- Greensboro (Grimsley) Senior High School,
- James B. Dudley High School,
- Needham B. Broughton High School.

Although research indicated that many education buildings constructed during this time period were designed by architects, it was not until after the sample selection was made that the researcher discovered that all of the high schools being studied were not only designed by architects but were designed by distinguished architects of the time. Table 1 is a spreadsheet including general information about the six high schools selected for research.

Table 1. Spreadsheet of general information regarding selected sample.

<b>Building Name</b>	<b>Location</b>	<b>Construction Date</b>	<b>Style</b>	<b>Architect</b>
Roanoke Rapids High School	Roanoke Rapids	1921	Tudor Revival	Hobart Upjohn
Richard J. Reynolds High School	Winston-Salem	1923	Neo-Classical Revival	Charles Barton Keen
Asheville High School	Asheville	1929	Art Deco/Italian Renaissance	Douglas Ellington
Greensboro (Grimsley) Senior High School	Greensboro	1929	Gothic Revival	Charles Hartmann
James B. Dudley High School	Greensboro	1929	Gothic Revival	Charles Hartmann
Needham B. Broughton High School	Raleigh	1929	Italian Lombard Gothic	William Henley Deitrick



Following is a photographic representation of the sample of high schools from the National Register of Historic Places nominations.



Figure 7. Roanoke Rapids High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 8. Richard J. Reynolds High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 9. Asheville High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 10. Greensboro (Grimsley) Senior High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.





Figure 11. James B. Dudley High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 12. Needham B. Broughton High School National Register photograph. Courtesy of Department of Cultural Resources, Historic Preservation Office.

## **Data Collection**

In order to analyze the changes made since the original construction of the six selected historic high schools, the researcher used National Register of Historic Places nominations along with the accompanying photographs, original floor plans when available, recent floor plans, archival research, archival photographs, site visits, and current photographs.

First, the researcher obtained copies of each school's nomination to the National Register of Historic Places from the North Carolina State Preservation Office. The nominations were a starting point in understanding the history, significance, and physical description of each building.

To supplement the archival research, the researcher collected visual data that would be critical to the thesis such as original and current architectural floor plans as well as historic and current photographs. These visual documents were crucial pieces needed to identify spatial alterations that had been made to the original buildings. These items were collected in a variety of ways. Original floor plans to four of the six high schools were found. For the other two, Roanoke Rapids High School and James B. Dudley High School, older plans were used during the analysis. Original floor plans were located either through website archives, architecture firms that had previously worked on renovations to the schools and had used the original plans as a reference, or school maintenance departments. Current floor plans were located through architecture firms that had completed renovations or through school maintenance departments.

The first set of photographs for the historic high schools was obtained through the National Register of Historic Places (NR) nominations. After scanning all photographs included in the NR nominations, the researcher acquired additional historic photographs from yearbooks and archives at the schools.

### **Evaluation Process**

Once the sample was selected, research conducted, and data collected, the researcher evaluated each historic high school by comparing original/older floor plans to recent floor plans and historic photographs to recent photographs. For the purpose of this thesis, the researcher did not analyze any floors other than the main (first) floor of each high school, nor did the researcher analyze any additional buildings or additions that were added to the school's campus following the original 1920s construction. The main floor was analyzed as opposed to all floors within the building because the main level has an equal representation of spaces that all the schools in this study have in common. These spaces define the school. Both primary and secondary spaces contained on the main level were analyzed in this thesis. These included main entrances, lobbies, corridors, auditoriums, and classrooms. The primary spaces analyzed are school entrances, lobbies, corridors, and auditoriums. Primary spaces are often places in a building that the public uses and sees the most (Jandl, 1988). They are normally the most architecturally detailed spaces as well and are important to the character of the building (Jandl, 1988). The secondary spaces are classrooms. Additional buildings that were built after the original construction date of the main buildings were not analyzed since the focus of this research

is solely on the 1920s school. Although additions were not analyzed in the same way as the original high school building, they were evaluated by the researcher to note how the campuses had expanded over time.

An in-depth evaluation of the original/older floor plans and historic photographs of each high school allowed the researcher to understand the evolution of the interiors to their current appearance. Once there was an understanding of the original building, a comparison between the original and the current building occurred. The researcher used a system of color-coding the original/older and current floor plans (Figures 13-17). Similar rooms would receive similar colors. For instance, corridors would always be color-coded light green and classrooms light blue. Color-coding made any spatial changes more vivid. Once the floor plans were color-coded, the researcher then highlighted new wall construction in red. This made any new wall construction easily viewable. Following is the color-coding key and two sets of color-coded high school plans.

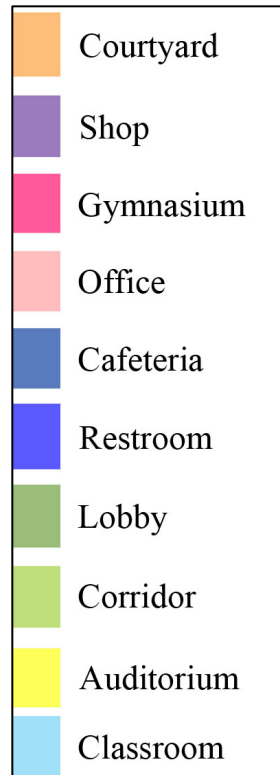


Figure 13. Color-coding key.



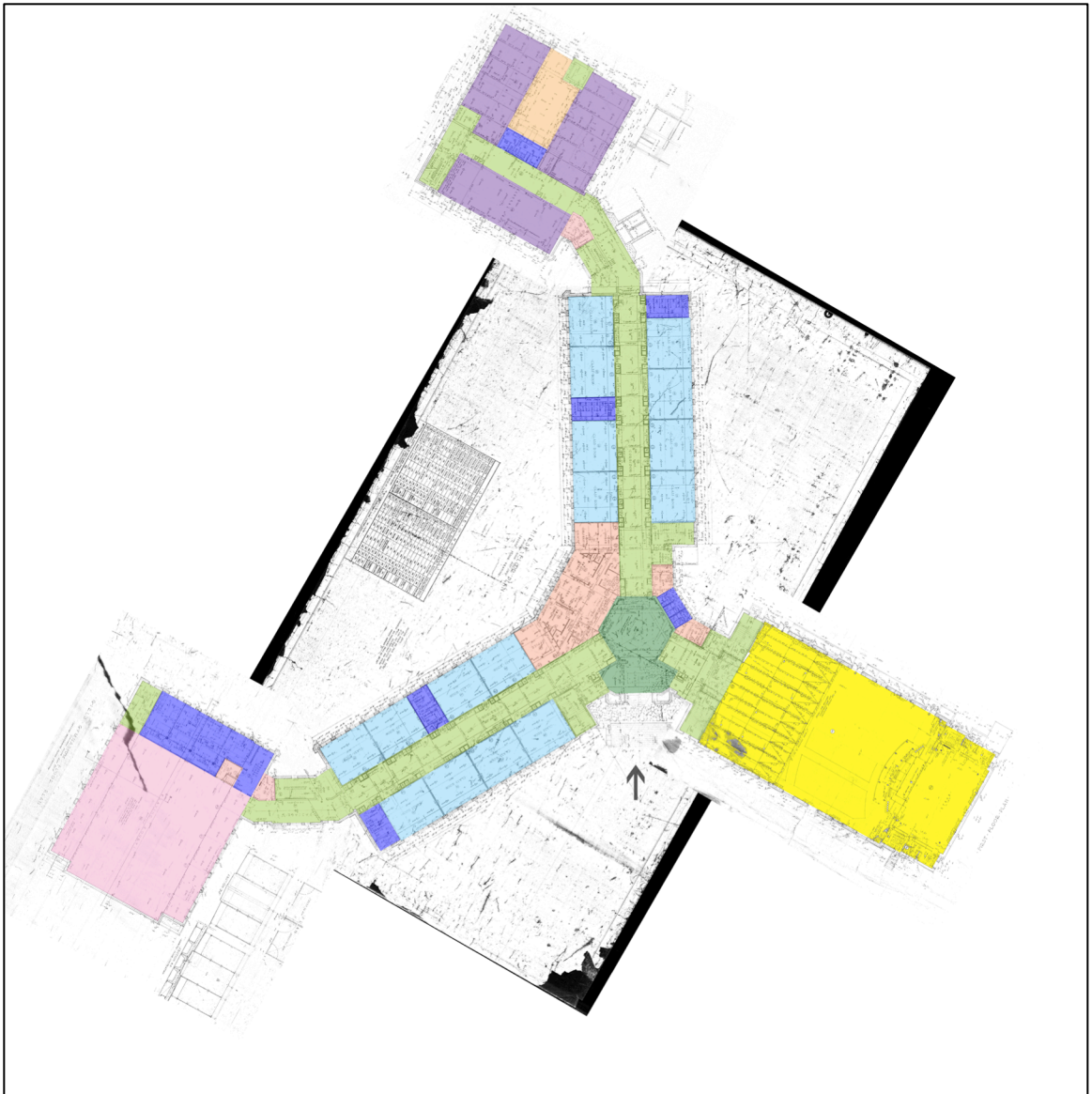


Figure 14. Example of original floor plan of Asheville High School color-coded. Courtesy of Architectural Design Studio.



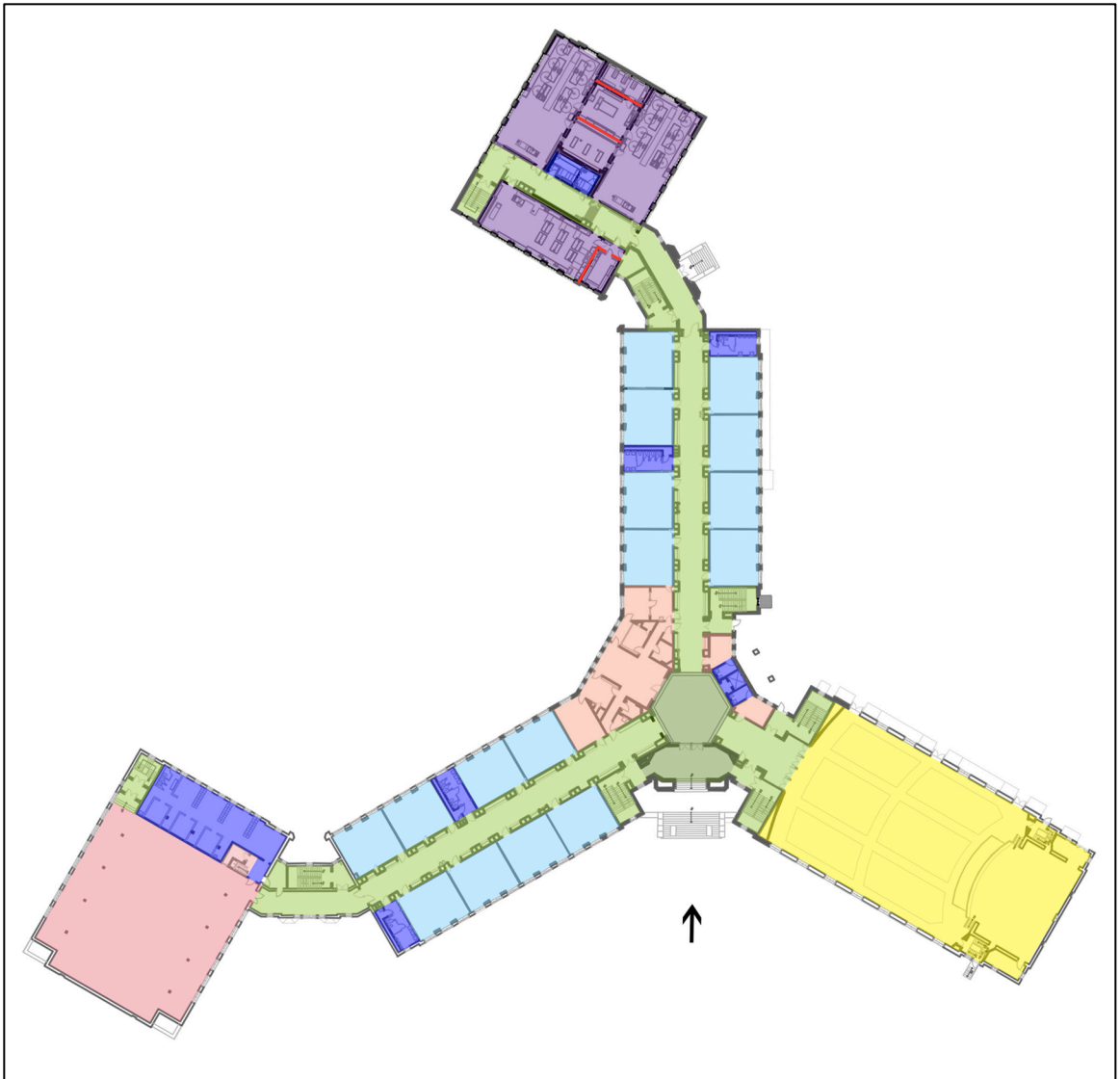


Figure 15. Example of current floor plan of Asheville High School color-coded. Courtesy of Architectural Design Studio.



Figure 16. Example of original floor plan of Richard J. Reynolds High School color-coded. Courtesy of Ersoy Brake Appleyard Architects.



Figure 17. Example of current floor plan of Richard J. Reynolds High School color-coded. Courtesy of Ersoy Brake Appleyard Architects.

After color-coding the floor plans, the researcher then analyzed historic and current photographs. There were many cases when historic photographs could be paired with current photographs that had a similar view. This allowed the researcher to pinpoint specifically the changes that had or had not occurred. Photographs proved to be essential pieces that provided the researcher a greater understanding of the building, like the following photographs of the auditorium of Asheville High School.



Figure 18. Example of pairing similar historic and current photographs of the auditorium at Asheville High School. Top two historic photographs courtesy of The Alumni Center of Asheville City Schools, Asheville, NC.

Once the floor plans were color-coded and the photographs gathered and paired, the researcher analyzed the key spaces as previously identified by utilizing the strategies as identified by Brooker and Stone in *Rereadings* and the eight criteria as established by Leimenstoll in *An Interior Perspective on Design Review*. While there are three strategies, including intervention, insertion, and installation, only one pertained to the rehabilitations in this study. As will be identified further in Chapter IV, intervention was the strategy taken with each historic high school. The criteria (form, rhythm, proportion, scale, light, materials, finish, and detail) were used to describe each key space, as it appeared both originally and currently. Using the criteria, the researcher created a matrix for each space to be analyzed. Each school had two matrices, one for the original building and one for the current building. After the matrix was made, the researcher filled in information regarding the form, rhythm, proportion, scale, light, materials, finish, and detail for each key educational space. When any information could not be determined, that field was left blank. This methodology provided the researcher with information about each school that could be compared against each other and patterns identified.

Technological expansions were also discussed during each site visit. The researcher asked the guides to show examples of how their particular school was meeting technological demands and once the information was given, the researcher verified by referring back to current plans. While the matrix could not aid in the identification of how the schools were able to expand, original and current floor plans, along with

Geographic Information Systems (G.I.S.) proved helpful when establishing how each school was able to expand when needed.

Once the collected visuals were analyzed, the last step in the analysis was site visits to each high school in order to view and take current photographs of the spaces. Photographs were taken of the exterior and interior of each historic school building. The site visits also provided the researcher a clearer understanding of the layout and materials of each historic high school that plans and photographs could not convey as clearly.

Through this methodology, the researcher determined how key spaces have been rehabilitated over time to accommodate the evolving educational needs while preserving their historic character, how expansion of the building and/or site had been accommodated, and how technology had been introduced to the historic building.

## **Summary**

The goal of the study was to determine how historic high schools had been adapted over time while preserving their historic character. The researcher identified not only how key spaces (main entrances, lobbies, corridors, auditoriums, and classrooms) had been renovated but also how technology had been accommodated as well as new buildings to the site. The researcher expected that some alterations must have been made to key spaces since the 1920s but since each were listed on the National Register of Historic Places, the researcher also anticipated that much of the exterior and interior historic character would have been preserved, illustrating how historic high schools from the 1920s can still be viable buildings for continued educational purposes. If these

schools maintained educational use for nearly 100 years, other schools from this era can also be preserved and continue as schools instead of being demolished or adapted.

## CHAPTER IV

### ANALYSIS

The initial analysis of the impact of changes to the integrity of the six high schools was assessed according to Leimenstoll's (1988) eight criteria: form, proportion, rhythm, scale, light, material, finish, and detail. Considering these criteria provided a more thorough understanding of the consequences of the specific alterations on the authenticity of each building. In the analysis it was helpful to create a criteria grouping of form, proportion, rhythm, and scale to avoid unnecessary repetition and description. The criteria of lighting, materials, finishes, and details remained as separate categories. Through the groupings and separate categories overall similarities between the case studies were identified.

When viewed as a whole, the analysis revealed all six schools retained fabric-based, constructed, and experiential authenticity (Wells, 2010). For each case study, the design approach to alterations over time was consistently one of restrained intervention. Brooker and Stone (2004) define intervention as a design strategy in which the new and old designs become intertwined with the new alterations often being small and related to the original building. When an intervention approach is taken, the original building inspires any changes that are made and the dialogue between the new and old is very understated with the alterations deferring to the historic character and the original character remaining intact and visually dominant (Brooker & Stone, 2004). Restrained

intervention is used to describe the selected sample because these high schools generally had very little alterations made that affected the overall historic character, partly because these schools have not changed their intended use but have remained as schools since they were first constructed. But, also, when changes were made, they were done sensitively and selectively in order to preserve the integrity of the school with the street façade and interior public spaces approached more sensitively than others. The analysis answered the major research questions in the following ways. Analysis as to how these conclusions were drawn will be developed further in this chapter but an overview follows.

- The historic integrity of the street façade, overall building footprint, and key public spaces (front entrances, lobbies, corridors, classrooms, auditoriums) remain intact despite their rehabilitations to accommodate evolving educational needs over time.

- The expansion to the buildings and sites were accomplished while keeping the original historic school building the focal point of the campus. Even the original landscape architecture of the public “front lawn” of each high school has remained true to the original character, with one exception.

- The impact of the introduction of technology was minimal on the architectural character of the high schools, especially the public spaces.



## **Analysis of Alterations to Key Spaces**

### *Form, Proportion, Rhythm, & Scale*

#### Exterior

The key spaces (front entrances, lobbies, corridors, classrooms, auditoriums) have been rehabilitated over time to accommodate the evolving educational needs while still preserving their historic character because each school took a restrained intervention approach to their rehabilitations. These key spaces were selected for analysis because research identified that each school in this study had these spaces in common. Also, front entrances, lobbies, corridors, classrooms, and auditoriums are spaces that are most representative of historic schools. They also represent both primary and secondary spaces found in schools. The primary spaces analyzed include school entrances (exterior), lobbies, corridors, and auditoriums. Primary spaces are often places in a building that the public uses and views the most (Jandl, 1988). They are normally the most architecturally detailed spaces as well and are important to the character of the building (Jandl, 1988). Secondary spaces analyzed are classrooms. Secondary spaces such as classrooms tend to be more utilitarian than primary spaces with usually less character defining detailing.

Before identifying common patterns in the approach of rehabilitating historic high schools in the study, the overall form of each school was analyzed by reviewing original and current floor plans. For this study *form* refers to the three-dimensional shape or geometry of the entire building, a series of interior spaces, or a single interior space. Closely related to form, *proportion* refers to the relationship of height to width to depth

of a form (Leimenstoll, 1988). The architectural plans were used to determine the form of the building, configuration of the corridors, arrangement of space, and addition of walls. Original and current architectural plans were also studied to identify changes in the rhythm and scale of the buildings. *Rhythm* is defined as the repetition of architectural elements or spaces to create a perceived order to the building. *Scale* refers to the size of spaces, architectural elements, and details in relation to human size (Leimenstoll, 1988).

Several characteristics were apparent when plans were analyzed and compared. Each of the 1920s school buildings is shaped in an alphabetical or numerical form. As stated earlier in the Literature Review, buildings shaped in alphabetical characters were designed in order to maximize the amount of natural light and ventilation in the classroom (Engelhardt et al., 1949). Consistently, each school was designed so that every classroom would have windows. The original buildings' massing are symmetrical and this symmetry was translated throughout the building in plan, façade, fenestration, and spatial arrangement. Roanoke Rapids High School and the main building at Greensboro (Grimsley) Senior High School are T-shaped with the classrooms placed horizontally and the auditorium wing vertically in plan view. The academic building of Richard J. Reynolds High School is shaped in a block figure-8, with two interior courtyards. Asheville High School has a Y-configuration while James B. Dudley High School is a shallow U-shape. Needham B. Broughton High School is H-shaped. The configuration of each school dictated the placement of corridors and classrooms.

The analysis revealed that the overall exterior form and proportion of the original 1920s high school buildings remained intact, as did the interior configuration. As can be

seen in Figures 19 and 20, the overall form of Greensboro (Grimsley) Senior High School and James B. Dudley High School has remained consistent to when the buildings were constructed in 1929. These two examples reflect how the high schools in this study have maintained their original alphabetical or numerical shaped building footprints. The significance of noting that the buildings in this study have retained their original form is important because the form of the buildings is one of the most public elements of the building. Any change that affects the street view of an historic building can damage the historic character. As referenced by Nelson (1988), the exterior of an historic building is the most prominent element that conveys the overall character of the building. It is the more prominent and public areas of a historic building that must preserve the historic integrity if the character of the building is to remain. The retention of the unique school building forms is an example of restrained intervention. While the original form never altered, additions were made to the original building at James B. Dudley High School and Needham B. Broughton High School. These additions were always placed to the rear of the building and never became the focal point of the campus. When additions were necessary, their placement maintained the continuation of the original building being the focal point on campus and the additions never interfered with the original form. By being conscientious to the original high school building, additions never affected the integrity of the prominent form of the building. The consistent retention of the formal symmetry and distinctive configurations of the building footprints suggests the value placed on the iconic presence of the school experienced as an object in the fabric of the community and as experienced within the public spaces.

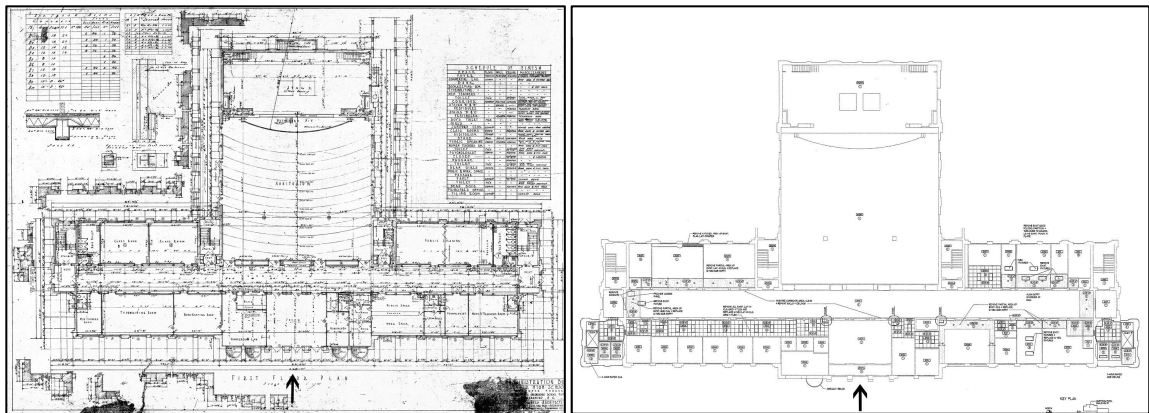


Figure 19. T-shaped plan of the Main Building at Greensboro (Grimsley) Senior High School. Plans from the Guilford County Schools and the former Greensboro City Schools System archives.

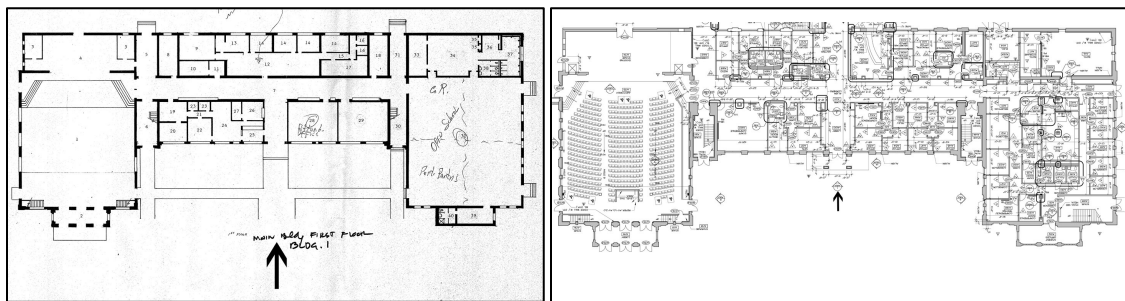


Figure 20. U-shaped James B. Dudley High School. The form of the building remains as it was originally. Plans from the Guilford County Schools and the former Greensboro City Schools System archives.

These high schools were able to retain their iconic community presence by limited alteration to the exterior of the building. All of the interiors of the six historic high schools have undergone several alterations since being built in the 1920s, yet the key spaces have retained a significant amount of architectural character, which was achieved by a restrained intervention approach. The exteriors of the high schools are similar to the interiors because like the interiors, much of the original architectural character remains. The front façades of these high schools were the iconic symbols to the surrounding communities during the 1920s, and they have remained as iconic symbols by having little

change made. The exterior of the high school buildings in this study are strikingly intact. As previously stated in Chapter II, the high schools of the 1920s were designed and built to be icons for the surrounding community. The iconic nature of these schools is mostly demonstrated by their exterior presence. Since the community views the exterior of the historic school the majority of the time, the prominent street view of the schools has been retained through restrained intervention. This reflects the community values-based preservation philosophy as defined by Randall Mason (2006) and experiential authenticity as defined by Jeremy Wells (2010). Values-centered preservation and phenomenological or experiential authenticity is achieved by preserving the inherent emotions conveyed in an historic building and to the values the community places on the building (Wells, 2010).

While the front most prominent façades of the high schools in this sample have remained strikingly intact. One of the reasons why the front façades retain high architectural integrity is due to the retention of the window fenestrations. Window openings provide a strong rhythmic pattern to a building's exterior and when original openings are altered, the rhythm that was created is also altered. While the one consistent alteration that has been made to the exterior of each high school has been window replacements, all schools were able to retain their original exterior rhythm by choosing window replacements that were similar to the original. By choosing windows that are the same in size as the originals, the openings did not need to be changed and therefore the rhythm of the window fenestrations remained. This is an example of restrained intervention because even though new windows were added, the existing building

determined their location and size. The rhythm of elements has stayed consistent as has the form, proportion, scale, material, finish, and details (Figure 21). The restrained intervention that has been taken on the front, most publicly viewed façade of each high school has allowed for the exterior to be hardly changed. Since the front façade is the most prominent and iconic of any building, it is the most important to retain historic character. Other façades of the building that are less prominent than the front are more lenient in regards to changes that can be made. For example, Needham B. Broughton High School has had several expansions to the rear of the building (Figure 55). While the expansion has altered the original rear façade, since the presence was not as prominent as the front façade these alterations could be made. But it is important to note that new building additions had to be similar in form, proportion, scale, material, and detail as the original in order for the new expansion to blend.



Figure 21. Richard J. Reynolds High School's front façade/main entrance. It remains little changed. Photo by author.

An example of an alteration to the front facade, besides the window replacements, can be seen at James B. Dudley High School. The original entrance (Figure 22) was altered after a 2005 renovation. The original entrance consisted of a one-story slightly projecting portico with Doric columns. As seen in Figure 23, the original entrance was replaced with a cast stone entry portico. While the front entrance was altered, the changes made were compatible to the original in form and therefore exemplify restrained intervention. There are several reasons the new entry portico is an example of intervention. The placement of the portico is the same as the original, the form of vertical and horizontal elements is similar to the original, and the rhythm of the elements is

similar. The congruousness of the new portico compared to the original allows for an alteration such as this to be considered restrained intervention and not a significant impact to the historic character of the school.



Figure 22. James B. Dudley High School's front façade and original entry portico. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 23. Current entry portico at James B. Dudley High School. Photo by author.



The addition of elevator towers to either end of the front façade at Greensboro (Grimsley) Senior High School is another example where alterations were made to the front façade. While all of the other historic high schools in this study were able to add elevator towers in less conspicuous areas of the building, Greensboro (Grimsley) Senior High School needed to add the elevator towers on both ends of the corridor. In order for the exterior to be compatible with the historic building, close attention was paid to the form, proportion, rhythm, and scale of the additions as well as to the material, finish, and detail. Since both towers were placed in prominent locations, design decisions were made in order for these towers to become discreet extensions of the original building. The form, proportion, and scale of the elevator towers conformed to the existing form, proportion and scale of the high school, which created a seamless flow from the original building to the new additions. Similar rhythm was achieved by the continuation of buttresses. Also, the materials of brick and cast stone are almost identical to the 1920's school. The brick's finish is about the exact color as the main building block and the detail of pyramidal cast stone caps mimicks the original building as well. The similarity of the original and new elements illustrates the restrained intervention that was applied during the constructing of the elevator towers. It was very important that the additions be congruous with the original building to maintain the integrity of the front façade. The elevator towers from the exterior appear to be almost identical to the original building since attention was paid to the eight criteria (Figure 62). While the overall form and proportion of the original 1920s high school building exteriors remain intact, the interiors have seen alterations.

## Interior

A commonality within all six high schools was the addition of partition walls in many of the original large classrooms thereby creating more rooms for instruction or office purposes. While each school has had some sort of reconfiguration of classroom spaces, some have had more than others. An example of the type of classroom divisions that has consistently occurred can be seen in Needham B. Broughton High School and Richard J. Reynolds High School. Both of these examples represent an average space division that has occurred in the six schools. As seen in the comparison of Figures 24 and 25, walls have been added to the original Needham B. Broughton High School in both offices and classrooms. Adding walls affects the form of the interiors and rhythm of the building but it also allows for current needs to be met. The reason that walls could be added to the original classrooms is because the classrooms were designed to be large multipurpose spaces. Thus, the size of the 1920s classrooms has made the buildings more conducive for adapting to current educational needs. While walls were added, original walls were hardly ever removed. The proportion and scale that was original to the classrooms has changed, the alteration intervention remained restrained. Walls can be added to an existing building without damaging the integrity of the building as long as the walls are placed only when needed and when the overall form of the building is not hindered. The reason that the wall additions within this selected sample did not affect the character of the building is because when changes within one of the criteria (form, proportion, rhythm, scale, light, material, finish, detail) were made, attention was made to retain the other criteria. In order for the integrity of the historic building to remain,

alterations should never change all of the criteria. A balance must exist where the original elements remain the most visible with the new elements deferring to the original. For example, when walls were added to classrooms, which affected the proportion and scale of the room, attention was closely paid to retaining light, material, finish, and detail.



Figure 24. Needham B. Broughton's original plan color-coded. The plan illustrates the H-shaped form of the building. Needham B. Broughton High School, Special Collections Research Center, North Carolina State University Libraries.



original corridor is significant to keeping the integrity of the architectural character of a historic building. Retaining original corridors means keeping the original circulation pattern and form of the historic building. When corridors alter, other changes happen as well. The circulation pattern changes and the placement and accesses to offices and classrooms change, which affects the form and rhythm of the original interior. These changes could potentially put the integrity of the historic building at risk, so keeping the original corridor pattern is important when trying to retain original historic character.

In the case of the corridor alteration at Richard J. Reynolds High School, the decision to change the corridor was made but it was done in order to have as little impact as possible to the integrity of the school building. This is an example where restrained intervention was applied to the alteration. During a renovation that occurred in the 1990s, the figure-8 corridor was modified. In order to retain the interior courtyards while still creating rooms for desired educational purposes, several things occurred to the original interior form of Reynolds High School. As seen in the comparison of the original and current plans (Figures 26 & 27), several rooms were eliminated with the addition of others. The colors used in coding the floor plans highlights how the boys and girls locker rooms (purple) located in the center of the plan were eliminated in order to create more offices (light pink) in the central section. The alteration of walls in this instance changed the corridor pattern. Originally there was one central corridor between the two interior courtyards and presently there are two central corridors. The addition of two central corridors changed not only the interior form of the high school, but the rhythm as well. While the academic building at Reynolds High School had the only

change in corridor circulation pattern, the rehabilitation is still restrained in approach because the overall exterior form of the building and the arrangement of classrooms and offices have not changed. This could be an example of constructed authenticity. As described in Chapter II, constructed authenticity focuses on the ideas that were embodied during the construction of a historic building and while little original material may be left, the building as a symbol to its era still remains with constructed authenticity (Wells, 2010). The interior courtyards that make Richard J. Reynolds High School unique in its figure-8 design were retained thereby keeping the form, proportion, rhythm, and scale of the building overall intact.

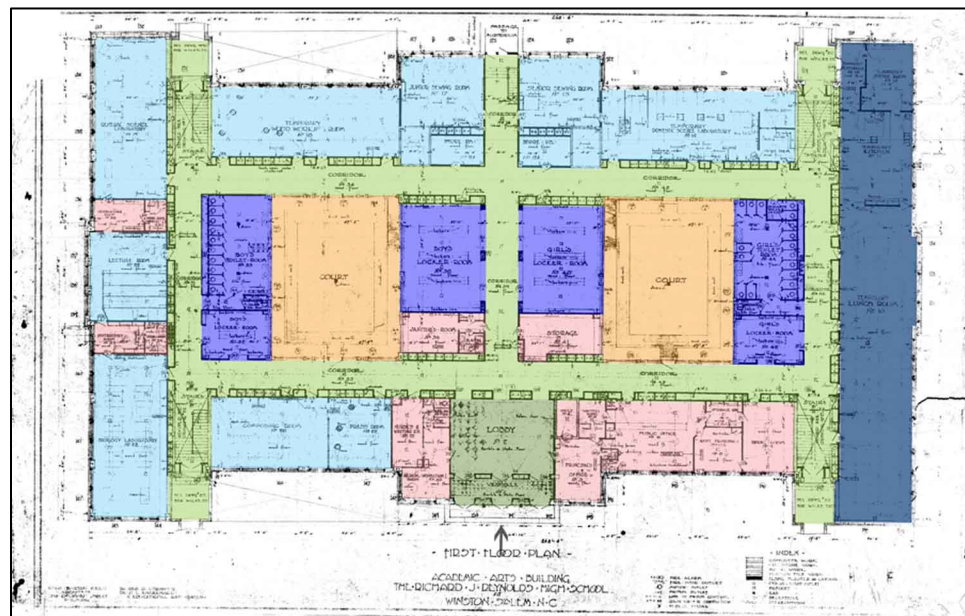


Figure 26. Richard J. Reynolds' original plan color-coded. The plan illustrates the placement of the interior courtyards (orange), classrooms (light blue), and offices (light pink). Courtesy of Ersoy Brake Appleyard Architects.

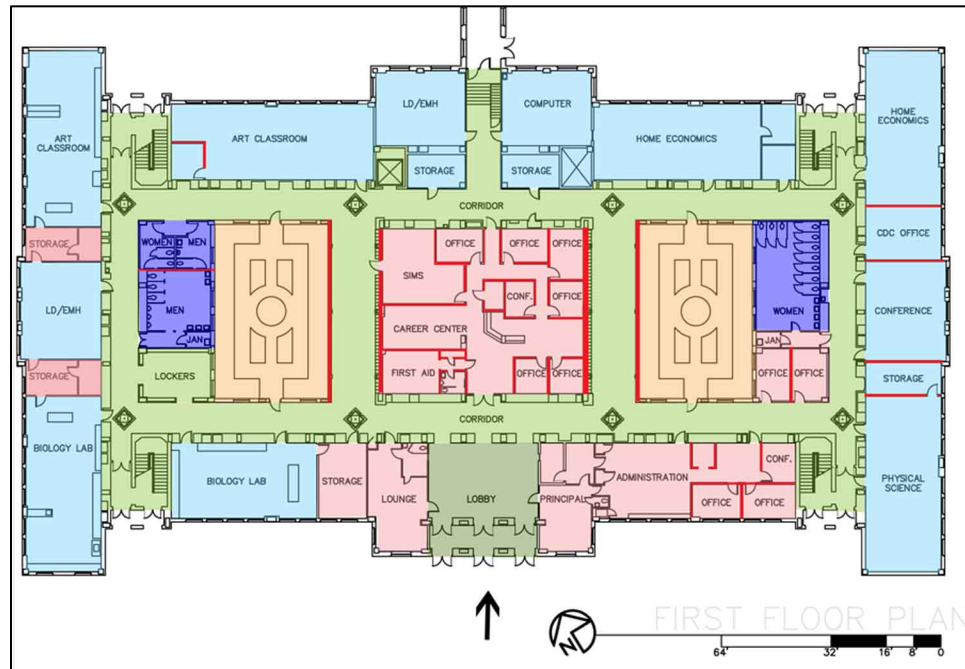


Figure 27. Richard J. Reynolds' plan color-coded. The plan shows the school after the 1990's renovation when the corridor configuration was altered and the office core added in the center. Courtesy of Ersoy Brake Appleyard Architects.

Another alteration that affected the category of form, proportion, and scale was the ceiling heights. All six high schools have altered ceiling heights in several key areas. While the areas varied where ceiling heights changed, consistently, every school had places where the ceilings were lowered, affecting the proportion and scale of the space where the alteration took place. Ceiling heights were either lowered in corridors or classrooms but never in lobbies or auditoriums, with the exception of James B. Dudley High School. The decision to lower ceilings was done in order to mask the introduction of electrical wiring and HVAC pipes. The ceiling is often chosen to take on a large amount of work. Not only does the ceiling contain artificial lighting but it most often has to carry and conceal HVAC systems, detectors, alarms, pipework, and technological

wiring (Brooker & Stone, 2004). Although ceiling heights were selectively lowered, they were never lowered throughout the entire building. More importantly, the height of the original spaces was generous enough that the minimal change in height did not significantly alter the perceived proportion or scale of the space. In addition the lowered ceilings did not conceal architectural features such as windows. Such minimally intrusive alterations exemplify a restrained intervention approach. Table 2 illustrates specifically where the ceilings were lowered in each school.

Table 2. Location of lowered ceiling heights. Including an approximation of how much they were lowered.

	Lobby	Corridor	Classroom	Auditorium
Roanoke Rapids High School		Lowered by 1'5"	Lowered by 1'5"	
Richard J. Reynolds High School		Lowered by 1'6"		
Asheville High School		Lowered by 2'	Varies but majority lowered by 2'	
Greensboro (Grimsley) Senior High School		Lowered only in (Old) Science Building by 2'		
James B. Dudley High School	Lowered by 2'	Lowered by 2'	Lowered by 2'	
Needham B. Broughton High School		Lowered by 1'	Lowered by 1'	

As seen in the above table, Roanoke Rapids High School currently has lower ceiling heights in both classrooms and corridors. Ceiling heights dropped from 13 feet 5



inches to approximately 12 feet. Figures 28-30 illustrate the original height of the ceiling and the slight alteration of proportion and scale from lowering the ceilings. Figure 29 shows how even though the ceilings were altered, they were not altered in a way that would affect the windows or the natural light entering the classroom. None of the high schools that lowered ceilings in classrooms altered the original window fenestrations. The decision to lower the classroom ceilings at Roanoke Rapids High School is another example of using the restrained intervention strategy. By not changing the natural light coming from the original openings, not closing or blocking any of the original windows or doors, and by lowering the ceiling heights just enough so that wires and pipes could be placed between the original ceiling and the drop-in ceiling, the character of both the classroom and corridor was retained. Also, since the ceilings of classrooms and hallways do not have the detailing as most lobbies and auditoriums have, the addition of drop-in ceiling tiles never covered character-defining details on the ceiling. If the ceilings had been lowered and were blocking windows, doors, or covering detailed ceilings, the character of the school would have been greatly lessened, but this sample demonstrates how to successfully intervene while not affecting the character of the historic school.



Figure 28. 1939 photograph of original ceiling height at Roanoke Rapids High School. Courtesy of Roanoke Rapids Graded School District.



Figure 29. Lowered classroom ceilings at Roanoke Rapids High School. Photo by author.



Figure 30. Lowered corridor ceilings at Roanoke Rapids High School. Photo by author.

Another example of a school in the sample studied that lowered ceiling heights is Richard J. Reynolds High School. Unlike Roanoke Rapids High School, Richard J. Reynolds High School ceiling heights were altered in the corridors but not in the classrooms. The original 13 foot 6 inch classroom ceiling height, as seen in Figure 31, were retained, as seen in Figure 32. The ceiling heights for the corridors dropped to approximately 12 feet (Figure 33). While each school altered the proportion and scale of each space that had a lowered ceiling, the architectural character of the space was retained with a combination of keeping form, light, material, finish, or detail elements and because the ceiling height was only slightly lowered and not dramatically executed. If the drop-in ceiling tiles had been lowered in the corridor so that the windows were

partially obstructed or if the trim traveling around the perimeter of the upper section of the wall was covered, the historic character would have been impacted in a negative way. Both Roanoke Rapids and Richard J. Reynolds High School illustrate how to successfully handle lowering ceilings in historic school buildings without affecting the character.



Figure 31. 1932 photograph showing original ceiling height at Richard J. Reynolds High School. Courtesy of Forsyth County Public Library Photograph Collection.



Figure 32. Current classroom with original ceiling height. Photo by author.

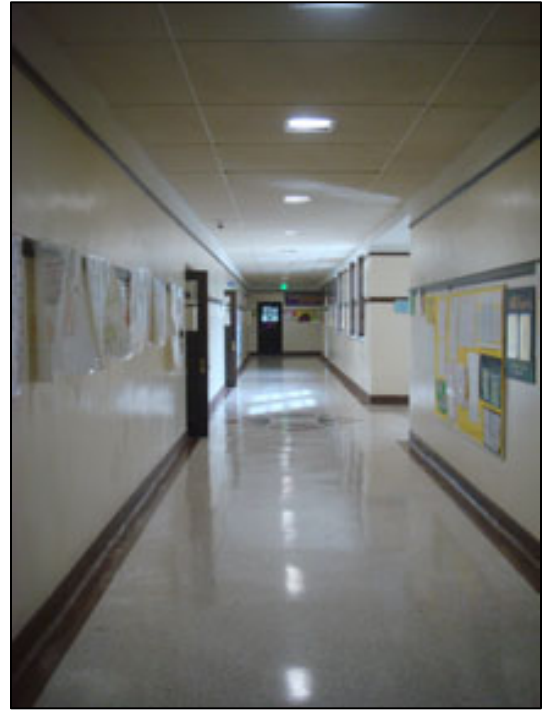


Figure 33. Lowered ceiling in corridors. Photo by author.

The analysis of the key spaces revealed that the auditorium and lobby are one of the most pristine spaces analyzed. This further solidifies the research of H. Ward Jandl. As been previously stated, primary spaces, which are often places in a building that the public uses and sees most often and are usually the most architecturally detailed are important to the character of the building and should be preserved in order to keep the character intact (Jandl, 1988). The lobbies and auditoriums within this study are among the spaces analyzed that are primary spaces and in return have the most character defining detailing. The fact that these were some of the most pristine spaces that were analyzed in this study may be partly due to these being primary spaces most frequented by the public and have therefore been best preserved.

The auditoriums retain one of the highest levels of original architectural character throughout, with the exception of Needham B. Broughton High School auditorium, which was destroyed by fire in 1969. Throughout the other schools, the architectural integrity of the auditoriums remains remarkably pristine.

The auditoriums were grand spaces with unique design elements. With the exception of Richard J. Reynolds High School, all of the high schools had auditorium wings that were directly connected to the school. Reynolds' auditorium is separate from the main academic building. One reason this may be is that the high school is not the only facility that can rent the auditorium space. Reynolds' auditorium is available for both the high school and the community to use. This arrangement was made during the original construction of the high school and auditorium.

Common elements that can be found in each historic high school auditorium are balconies and embellished proscenium arches that frame the stages. Original wooden fold-down chairs are located in Greensboro (Grimsley) Senior, James B. Dudley, Roanoke Rapids, and Asheville High Schools' auditoriums. Each auditorium was uniquely designed and was a place where the school and community could gather for lectures or performances. The auditoriums were also places of community pride. For example, when Roanoke Rapids High School was completed in 1921 the auditorium was claimed to be the best between Washington, DC and Atlanta. The details executed in the auditoriums are what make the spaces unique and stand apart from the rest of the school as the most elaborate areas. Unique details include murals at Greensboro (Grimsley) Senior High School and statues at Richard J. Reynolds High School (Figure 43). The

retention of the distinctive characteristics of the high school auditoriums illustrates that restrained intervention was applied to all rehabilitations. The murals in Greensboro (Grimsley) Senior High School auditorium were installed in 1934 by Raleigh artist James A. McLean. They depict “Energy” and “Education” and are located on the same wall as the stage allowing for them to be prominently located in the auditorium. These paintings were prominent features of the auditorium and the high school when they were installed and have become synonymous with the auditorium space.

Another example where restrained intervention can be noted in the auditorium is through the retention of three statues in the auditorium lobby of Richard J. Reynolds Memorial Auditorium. Their placement like the murals at Greensboro (Grimsley) Senior High School, have become prominent features in the auditorium. Restrained intervention was executed in each auditorium by thoughtful decisions regarding changes to the form, proportion, rhythm, and scale of the space as well as to the light, material, detail, and finish. These auditoriums were such renowned spaces within the high schools that when renovations were executed, the alterations were thoughtful and respectful to the original character, which has continued the notoriety of each of these spaces. Both the auditoriums and lobbies in this research represent all three authenticities as defined by Jeremy Wells. Fabric-based authenticity is represented by the amount of original materials, finishes, and details remain in the spaces. Constructed authenticity resides in the new elements that reflect what was originally located in these spaces and phenomenological (experiential) authenticity is represented by the emotions and memories that these space invoke.

## *Light*

The way that light enters into a space, whether it be natural or artificial, affects the character of the space. Any changes in the source, placement, or number of lights will thereby effect the character of the space (Leimenstoll, 1988). Natural light was critical when designing buildings from the 1920s because the majority of light that was needed had to be provided naturally. Electrical fixtures were used but were not as heavily depended upon as they are currently. As seen throughout each high school in this sample, additional artificial lighting was added in a variety of ways but natural lighting has not changed.

In regards to natural light, all of the buildings in this study have retained the original window fenestrations, with the exception of Richard J. Reynolds and Needham B. Broughton's auditoriums. Every auditorium within this study was constructed with large operable windows on either side of the main auditorium chamber. The windows not only provided light and ventilation when needed but their placement established rhythm on both the interior and exterior. Through the technological development of theatrical lighting and the introduction of HVAC systems, many of the auditoriums have deemed the large windows unnecessary. Four out of six of the high schools in this study have retained the original auditorium window openings. Richard J. Reynolds High School and Needham B. Broughton High School both have auditorium windows infilled with brick (Figure 34), which affects both the historic rhythm and light entering the building. The auditoriums of Reynolds and Broughton high school were the only example in the study that windows in the key spaces analyzed were altered. With the rest



of the sample, the schools have retained the original window openings and arrangement, which continues the original rhythm that was found on the exterior and interior as well as retains the original daylight that enters into the building. The fact that so few of the window openings have been altered is another instance where restrained intervention has been used and is an example of how these high schools are strikingly intact. The windows make up such a large portion of the building on the exterior and interior and therefore any alteration that affects these openings should always be minimal. Figures 35 and 36 illustrate how the character of a historic high school auditorium can be affected by enclosing the windows. As can be seen, the major element affected is light and while that does affect the character of the auditorium space, the retention of the original trim and finish details allows for this to still be an example of restrained intervention. Instead of infilling the openings and creating a flat wall surface, indentations where the windows were placed gives the perception of the rhythm that was made with the windows. The trim and finishes that highlighted the windows remains as well. For the four high schools that have retained the original window fenestrations in the auditoriums, heavy drapes are consistently used when sunlight needs to be blocked (Figures 37 & 38).



Figure 34. Reynold's Auditorium infilled windows. Notice the details surrounding the original window openings are still intact. Photo by author.



Figure 35. Reynold's Auditorium interior in 1932 before windows were infilled. Courtesy of Forsyth County Public Library Photograph Collection.



Figure 36. Reynold's Auditorium interior after windows were infilled. Like the exterior, the interior retains original detailing that surrounded the window openings. Photo by author.

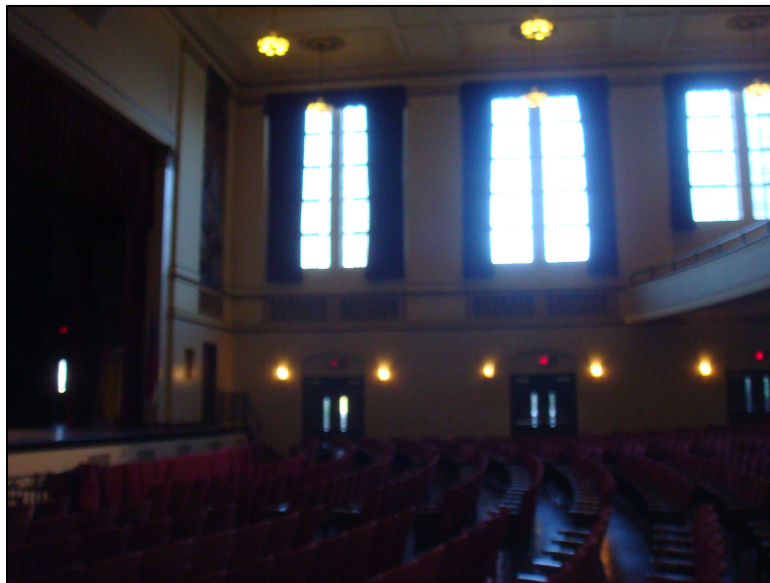


Figure 37. Greensboro (Grimsley) Senior High School's auditorium original window fenestrations. Heavy drapes are used in order to compensate for natural light entering the auditorium. Photo by author.

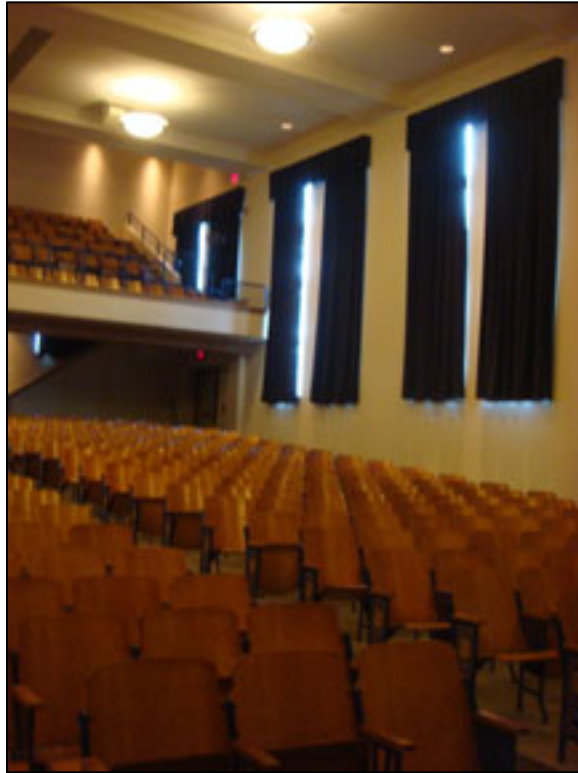


Figure 38. James B. Dudley High School's auditorium. The windows have heavy drapes like Greensboro (Grimsley) Senior High School. Photo by author.

Windows in these historic high schools give the building its unique character by establishing a definite symmetrical rhythm on both the exterior and the interior. While all six high schools have had window replacements, original openings were never changed, thereby keeping the rhythm and natural lighting that originally existed. The rhythm that the windows create on both the exterior and the interior of these historic high schools is important to maintain since they are such defining and prominent features of the building. And with the exception of Reynolds' and Broughton's auditoriums, the natural light that is provided has not changed since the buildings were built. Figures 39 and 40 show how the window fenestrations at Roanoke Rapids High School have not

altered. The reason why the window openings have not changed is because they are key in the original plans, which were designed specifically in order to maximize the amount of daylight and because they have a tremendous effect on the experiential authenticity of the historic building. As stated in Chapter II, schools from the 1920s were designed in alphabetical patterns (Engelhardt et al., 1949). This was done solely to maximize natural light entering classrooms. The purposeful form of the school which dictated the amount of daylight that could be accessed was essential in the original design of the building. If this was altered, the integrity of the building would be greatly diminished. But as seen in these case studies, the original window configurations were retained. This is an example of experiential authenticity. Daylighting is an essential part of the classroom experience within these historic schools and the retention of the original daylight entering the classrooms provides the same experience to staff and students as when the school first opened.



Figure 39. Roanoke Rapids window configuration when the school opened. Courtesy of Roanoke Rapids Graded School District.





Figure 40. Roanoke Rapids' current window configuration. The openings have not altered since the school first opened. Photo by author.

Natural light entering into these high schools has not changed since the 1920s, but the artificial lighting has. All high schools in this study have altered the interior lighting in all of the key spaces analyzed with few exceptions. All of the high schools added fluorescents in corridors and classrooms. The addition of artificial lighting in this study did not affect the historic character of the schools. Although several lighting solutions were used, their placement did not cause a negative impact to the integrity of the buildings because their placement was thoughtful and intentional. As has been consistent throughout the analysis, the lighting in the lobbies and auditoriums was the least altered. The fixtures in these more public places were either original or closely mimicked what was originally located there. Figure 41 highlights the lobby of Roanoke Rapids High School, which managed to utilize the original pendant lights, keeping the original integrity.



Figure 41. Roanoke Rapids High School lobby with original light fixtures. The lobby retains all eight criteria with the original form, proportion, rhythm, scale, light, material, finish, and detail. Photo by author.

In areas less viewed, such as corridors and classrooms, newer fluorescent lights were always added. The alteration of artificial lights took a restrained intervention approach since decisions were made to keep original fixtures when possible or to replicate the original as close as possible and when new light fixtures were added that were not original or did not represent the original, they were placed in less public, character defining areas. An example of a high school simulating original light fixtures can be seen in Figure 32 of a classroom at Richard J. Reynolds High School. The pendant, although larger than the original, resembles the form of the original fixture.

### *Material*

Throughout the analysis of the six historic high schools, it has been the lobbies and auditoriums that remain most remarkably intact. Little has changed in form,

proportion, rhythm, scale or light and the same goes for the materials in these key public spaces. In the other key spaces (corridors and classrooms) rehabilitation alterations have been more numerous but the spaces have had a restrained intervention. When materials changed, the new materials consisted of mostly acoustical ceiling tiles, carpet, and composite floor tiles. Materials that regularly remained the same as the original included plaster walls, ceilings, wood and tile floors, and wood detailing. All of the schools' interiors in this study have a combination of original and new materials. Materials were changed primarily due to several reasons including, lowering of ceiling planes to accommodate systems, health and safety, and durability. Examples of pristine lobbies and auditoriums can be seen in Figures 41, 42, 43, 49, and 52. These examples highlight the authenticity of the original materials which plays a role in the retention of architectural character. The maintenance of original historic materials is an example of fabric-based authenticity. Fabric-based authenticity relies on what was original to the building and is very curatorial in focus (Wells, 2010).





Figure 42. Lobby in the Main Building of Reynolds High School. It retains all original materials, finishes, and details. Photo by author.



Figure 43. Lobby in the Auditorium of Reynolds High School. It also retains all original materials, finishes, and details. Photo by author.

Architectural character has the most potential to be lost during material changes. If only selected materials are altered, the likelihood that the original character would be destroyed is not as high as if all of the materials are changed. James B. Dudley High School is an example of what happens when most of original interior materials have been exchanged for new materials. Dudley High School was listed on the National Register of Historic Places before major renovations occurred in the mid-2000s. Figure 44 was taken during the time when the nomination was written. Figures 45 and 46 show Dudley High School after renovations when new ceiling heights, lighting, materials, finishes, and details were introduced. Unfortunately, most of the interior of James B. Dudley High School has lost its original architectural character. As is similar with the rest of the historic schools in the study, Dudley's auditorium maintains the highest degree of architectural character (Figure 38) because it retains the original form, proportion, rhythm, scale, the majority of materials, finishes, and details. In the case of James B. Dudley High School the alterations that were made to all of the key areas, with the exception of the auditorium, did not take a restrained intervention approach to new design elements. Since the intervention strategy was not implemented, the historic character of the interior of Dudley High School was jeopardized. If restrained intervention along with attention to Leimenspall's eight criteria of form, proportion, rhythm, scale, light, material, finish, and detail had been used in the renovation design process, the historic character of the high school would have remained while still meeting the educational and technological demands that made a renovation necessary.



Figure 44. James B. Dudley High School before 2005 renovation. Courtesy of Department of Cultural Resources, Historic Preservation Office.



Figure 45. Corridor of James B. Dudley High School after renovation. Alterations occurred in materials, finishes, and details. Photo by author.



Figure 46. Main Office at entrance of James B. Dudley High School. Photo by author.

### *Finish*

Finish is closely related to material since finish is both the texture and color of the material. While there were instances of material changes, most original materials had finishes that were identical to what was originally present. For example, wood remained stained in a similar stain; plaster remained painted white with a smooth texture and raw materials such as brick and stone did not alter either. The majority of finish changes occurred when materials were not altered either. Figures 45 and 46 taken at James B. Dudley High School illustrate new materials in the school that have new finishes. In these two examples the floor is in two different colors of blue and white, the trim is in different stains, and the ceiling is a different material and finish as well. As with the previous criteria, when trying to maintain historic character, it is best to approach rehabilitations in a sensitive manner. Even in cases where materials change, using a

finish that resembles the original finish will help to maintain the integrity of the interior. The majority of the case studies in this research retained a large amount of original materials and the finishes stayed the same the majority of the time. Examples of finishes that remained consistent to the original finishes can be seen in Figures 30, 31, 35, 36, 41-43, and 49-52. An example of when the finish of an original material changed can be seen on the walls along the corridor of Figures 47 and 48 at Asheville High School. In the yearbook photograph from 1972, the walls of the corridor are divided almost in half by a very dark color on the lower portion and a light color on the upper. The current photograph shows the corridor walls, still divided in half, but with beige on the lower portion and white on the upper with a red stripe dividing the two finishes. While the corridor wall finishes at Asheville High School altered, the majority of the finishes remained consistent with the original finishes because a restrained approach was taken and thereby the architectural character was retained.

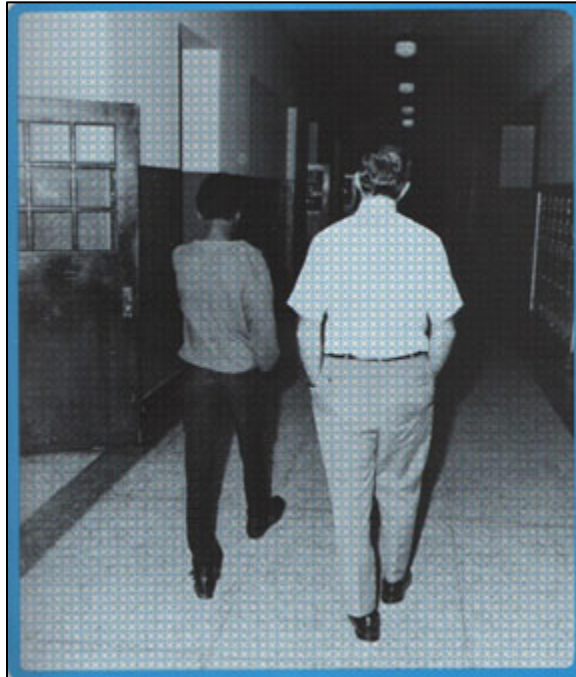


Figure 47. 1972 yearbook photograph of Asheville High School's corridor. Photograph illustrates the original finish of the corridor. Courtesy of The Alumni Center of Asheville City Schools, Asheville, NC.



Figure 48. Recent photograph of Asheville High School's corridor. Changes have occurred to the finish of the corridor walls, ceiling heights and details, and lighting. Photo by author.

## *Detail*

Another aspect in the key spaces that were analyzed was detail. Details are often identifying characteristics that define a building (Leimenstoll, 1988). Details represent architectural style, craftsmanship, and they tend to be features that distinguish a very public space, like an auditorium or lobby that generally has more detail, from a more private space, like a classroom or corridor that has less detail. Much of the detail in these historic high schools represent high levels of craftsmanship and much has remained since the schools were constructed in the 1920s. Trims and moldings are the most common details that have remained in the high schools but the details are not limited to just trims and moldings. Details such as original door handles on original doors can play into the overall retention of the original architectural character. Original details can be seen in Figures 32, 36, 41, 43, 49-53. Examples such as these illustrate that historic detailing can remain even during rehabilitations and continued use of historic high schools.

Figure 49 of Greensboro (Grimsley) Senior High School's lobby illustrates some of the original detailing that can be found on the main level of the Main Building. In this example, original form, proportion, rhythm, scale, light, material, and detail can be noted. While some of the finishes along the ceiling are not original to the lobby, it retains a high level of historic character. The tile baseboard, picture molding, and ceiling beams with decorative capitals exemplify some of the details that have been retained since the building was first constructed. The retention of these details through restrained intervention has allowed for the integrity of the space to remain. Since this is an area in the school that receives the most public attention because it is where people access the

building, little has been done to alter its original appearance.

Figure 50 is another photograph taken at Greensboro (Grimsley) Senior High School. This figure captures the detailed ceiling in the auditorium. As with the other schools in this sample, the auditorium ceilings were never lowered and it was because details like this should not be covered. Obscuring such details, like the coffered ceiling and decorative finishes surrounding the pendants, would negatively impact the historic character of the school. Details such as the door handles seen in Figure 53 should be preserved whenever possible as well. Even details as small as these play a role in demonstrating the character of a building. No matter the size or location, details should remain when possible by using a restrained intervention approach because they play a role in defining the historic character of the historic building.

While details should remain when possible; not all may. Figures 51 and 52 exemplify how details can be removed without significantly altering the character of the space. The embellished proscenium arch surrounding the stage at Asheville High School can be seen in both photographs. The majority of the original detailing has remained but the delicate plasterwork that filled every other square on the wall around the proscenium arch has been completely removed, which may have been due to damages over the years. It is important to note that even with the removal of these details, the majority of the other details were kept and is the reason why this auditorium has retained its historic character.





Figure 49. Greensboro (Grimsley) Senior High School's lobby. The lobby contains not only the original form, proportion, rhythm, scale, and light but materials and details as well. Photo by author.



Figure 50. Greensboro (Grimsley) Senior High School's auditorium ceiling. The ceiling has details including the coffered ceiling and design surrounding the pendant lighting still remaining. Photo by author.



Figure 51. Asheville High School's auditorium in 1929. Notice the detailed proscenium arch. Courtesy of The Alumni Center of Asheville City Schools, Asheville, NC.



Figure 52. Asheville High School's auditorium. The majority of the detailed proscenium arch remains. Photo by author.



Figure 53. Original door and handles at Greensboro (Grimsley) Senior High School. Even smaller details such as these handles can be retained. Photo by author.

### **Campus Expansion**

Each school has expanded beyond the original 1920s buildings and now has a campus consisting of several additions and/or buildings. As seen in current plans as well as images from Google Earth the expansion of school sites since the original building construction dates is apparent. The expansion to the building/site was accomplished by always keeping the original historic school building the focal point of the campus even the original landscape architecture surrounding each high school has remained true to the original character.

While not all of the expansion dates were discovered during the analysis, several were identified. Roanoke Rapids High School sits on 7.65 acres of land in Roanoke Rapids and consists of five other buildings on the site other than the original building and includes an administration building and cafeteria. Richard J. Reynolds High School occupies 27.38 acres in Winston-Salem and has had several buildings built after the original high school buildings were constructed. In 1952 the Gymnasium had additions added and in 1968 a Girl's Gym and History Building were built. Asheville High School has a total of 21.3 acres with a variety of other buildings that were built at various dates after the main building. In 1940, a maintenance building was constructed. Vocational buildings were added in 1949 and 1965. A gym and media center was built in 1973 and a cultural arts building was added in 1992. The campus at Greensboro (Grimsley) Senior High School is composed of 58 acres. The Girl's Gymnasium was added in 1939. A vocational building was added in 1942 and a Boy's Gymnasium in 1954 and Home Economics and Music Building in 1956. The next buildings that were added included the Library in 1967, the New Science Building in 1975 and Swimming Pool Building in 1976. James B. Dudley High School sits on approximately 30 acres of land and had a second gym built in 1959. Dudley has had numerous other buildings and additions added but the dates of construction are unknown, although they appear to be recent. Needham B. Broughton High School has 26.24 acres in Raleigh. Math and Science additions were added to the Main Building in 1954. A Cafeteria and Gymnasium were constructed in 1958 and 1959 respectively. The 1981 Auto Tech Building and 1991 Science Wing addition were further building expansions at Broughton High School.

These expansions have less to do with the increase in students, most schools retain a similar number as when the school first opened, but more to do with the expansion of subjects to the school curriculum and higher technological demands for subjects that were included during the 1920s. By planning ahead for additional buildings and acquiring more acres of land from the surrounding area if and when needed, each school has been able to expand when the need and finances arose. Examples of expansions to original 1920s buildings can be seen in Figures 54 and 55. As can be seen in both figures, the expansions to the high schools never encroached upon the prominence of the front façade, which is viewed the most by the public. It is important to note that these expansions were never executed with the hopes that they would become the focal point of the school. Instead, the restrained intervention approach that was taken always made the new additions a secondary focus and kept the iconic original 1920s building the primary focus. This has allowed for these buildings to remain the most prominent features of the high school campus and have upheld their street presence.



Figure 54. Greensboro (Grimsley) Senior High School's building expansions in red.



Figure 55. Needham B. Broughton High School's additions and new buildings in red.

Even with the continued expansion of these six high school campuses, all retain a central focus to the main building along with the landscaping surrounding the entrance. These high schools were created as community icons and were grand educational showplaces. The way the land was manipulated in front of the building was purposeful and reinforced the grandness of the high school. This remains true today. As can be seen in Figures 56 and 57, the landscape architecture of the front lawn of Asheville High School has not altered since the school originally opened. The rolling hills, sidewalks, and stairs leading to the central main entrance has not altered. Just like the lobbies and auditoriums are the primary, most public spaces within a high school and should retain a high degree of architectural character, the front façade and landscape architecture are the primary, most public areas on the exterior of the school and they should therefore retain as much historic character as possible. Vast lawns, stairs, sidewalks, curbs, and streets are some of the character defining elements that should be retained. Keeping these elements that were purposefully designed and constructed with the school in the 1920s is

important if the integrity of the school campus is to remain. This attention to keeping the historic building and landscape as the foremost important identity of the high school campus is another example of how restrained intervention was implemented and has kept the historic building the primary focus of the campus.



Figure 56. Asheville High School's landscape architecture during construction. Courtesy of The Alumni Center of Asheville City Schools, Asheville, NC.





Figure 57. Asheville High School's landscape architecture has been retained. This has been accomplished by keeping the central path and stairs as well as the rolling lawn. Photo by author.

These buildings were created with vast front lawns where students and staff could gather and socialize. The majority of these landscapes have been retained with the exception of Needham B. Broughton High School. Broughton originally had a large front lawn where a variety of activities occurred, including several football games. The lawn has since been converted into parking for students and staff. This result did not come without debate. Many of the alumni openly voiced concern that the front lawn was too integral to the school and should not be sacrificed. With the need for parking outweighing the need of the lawn, the school board decided to utilize the space for parking since many students were having to park along the streets of downtown Raleigh.



## **Introduction of Technology**

When built, these six high schools were considered modern buildings. The schools were designed to meet the needs of students, staff, and curriculum. The way classes are taught has changed dramatically since the 1920s. There is a heavy reliance on technology in today's school. Lighting in a classroom must be at a certain footcandle level. Computers, printers, scanners, and smart boards are part of daily student life. Auditoriums rely on dimmers, spotlights, catwalks, and soundbooths. These technological necessities were not in the plan of these high schools in the 1920s but in order for these six schools to remain as such, change was needed. Most of the buildings were sturdily built out of solid masonry making it difficult for electricians to wire these technologies. During each site visit, the researcher determined that the solution to introducing today's technologies was achieved by running wires in the plenum space provided by the drop-in ceiling tiles. By lowering the ceiling heights in corridors and/or classrooms, cables, wires, and pipes could be hidden in order to wire the school. The impact of the introduction of technology has been minimal on the architectural character of the high schools.

The researcher was able to witness the lowering of the corridor ceilings at Asheville High School (Figure 58). During the site visit, the high school was undergoing renovations to their science wing. In examples such as this, the wires in the corridor would travel into the classroom by cutting holes in the upper portion of the wall. The drop-in ceiling would not only hide the wires but also the incisions that were necessary when carrying them into the classrooms.



Figure 58. Asheville High School in the process of lowering the ceiling. Photo by author.

Tecnological upgrades had to occur for the school to continue functioning but these upgrades did not solely involve classroom technologies, HVAC systems had to be included in the schools and accessibility (ADA) needs had to be met. Much of the HVAC pipes and vents were carried throughout the schools in the same manner as the wiring, through the space provided by the lowered ceiling. They were sometimes even located in tunnels connecting buildings (Figure 59). Vents were added to the classroom in either the drop-in ceiling or through the upper portion of the wall (Figure 32). The actual HVAC systems were located in a variety of secondary spaces including tunnels and unused fourth floors (Figure 60) as was the case at Roanoke Rapids High School. Placing wiring, pipes, and building systems in unobtrusive areas allows for the character

of the building to be uninterrupted since they are placed in areas that the public should never encounter.



Figure 59. Tunnel with wires and pipes at Richard J. Reynolds High School. Photo by author.



Figure 60. HVAC system at Roanoke Rapids High School. The system is located on an unused fourth floor and remains unseen by the public. Photo by author.

Every school in this study had to meet ADA (Americans with Disabilities Act) requirements that all public buildings meet accessibility needs for individuals with disabilities. Alterations had to be made in order to meet these requirements. An example of how the high schools met these requirements is through the addition of elevator towers. Elevator towers were previously discussed in regards to form, proportion, rhythm and scale but elevators are also an example of a technology that was not anticipated in the original design and construction of the high schools but the provision of elevators is now a necessity.

Figures 61 and 62 illustrate how Roanoke Rapids High School and Greensboro (Grimsley) Senior High School added elevator towers for ADA purposes. The shape and configuration of rooms limited the options for placement of the towers. Roanoke Rapids High School was able to add an elevator tower to the rear of the building, thus masking its existence from the main front façade. By locating the elevator tower in an area that is not seen by the general public and is not part of the front façade allowed for some leniency in regards to following the eight criteria of form, proportion, rhythm, scale, material, finish, and detail since the rear of the building does not contribute to the overall historic character of the high school in this example. In the example of Roanoke Rapids High School's elevator tower, the form, proportion, scale, material, and detail are very similar to the original building. The most noticeable difference in the elevator tower addition is the change in finish. Since the bricks and mortar used are a different color than the original brick, the new tower addition is more evident. A somewhat less noticeable difference is in regards to the rhythm of the bricks. The elevator tower was constructed in a running bond brick while the school was executed in a common bond brick pattern. While these differences are noticeable, the similarities and the inconspicuous placement of the tower does not affect the historic character of the high school. In the example of Greensboro (Grimsley) Senior High School's elevator tower, the eight criteria were more closely executed in the new elevator tower additions since they are placed on either end of the front façade of the Main Building. Again, this illustrates the priority given to public over private or secondary spaces in historic preservation. While Roanoke Rapids had more leniency in the design details since the

tower was placed in the rear of the building where many will not see it, Greensboro (Grimsley) Senior High School had to pay strict attention to the form, proportion, scale, material, finish, and detail of the elevator tower addition since its placement is on the most prominent façade of the building. These examples illustrate how even when technological needs have to be met, consideration still needs to be made to the publicity of the area of the addition as well as to the eight design criteria when the historic character of a building is to be retained.



Figure 61. Elevator tower at Roanoke Rapids High School. The tower is similar in form, proportion, scale, material, and detail as the original building. Photo by author.

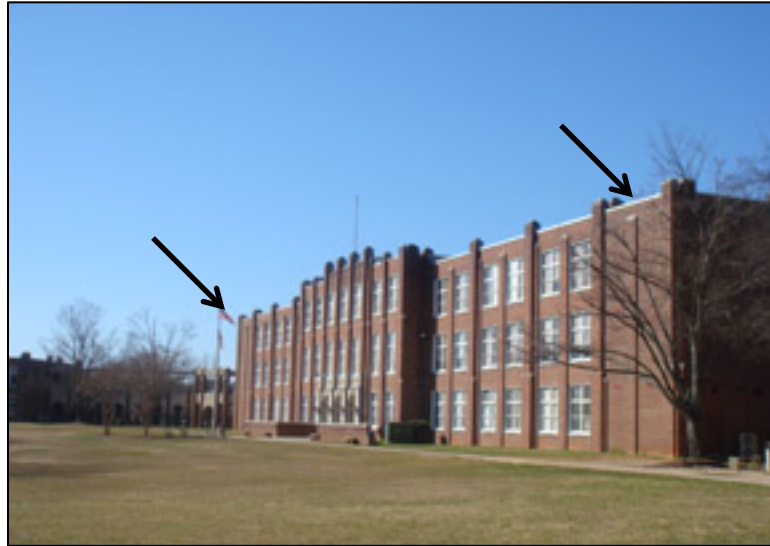


Figure 62. Elevator tower seen on either end of the front façade at Greensboro (Grimsley) Senior High School. Close attention was paid to form, proportion, rhythm, scale, material, finish, and detail. Photo by author.

In order for these historic high schools to continue functioning as high schools, certain technologies had to be introduced. Updating the buildings to meet current educational technological standards was vital for these high schools to remain as active, relevant pieces in the education of its students. When introducing current technologies into historic buildings some alteration of space will occur. Some alterations will be made throughout the life of a historic building but with the criteria of form, proportion, rhythm, scale, light, material, finish, and detail in mind, changes can be made when necessary without greatly altering the architectural character.

## Summary

The researcher did not anticipate identifying a high school in this sample that had retained all of its original architectural character. Since these six high schools have

survived as high schools for nearly 100 years the researcher came into this study with the expectation that some things must have changed. The hope was to find that the overall architectural essence of each school had remained. By noting the similarities and differences as to how the high schools addressed certain issues, the ways in which architectural character was respected and retained was identified. The utilization of the Brooker and Stone's three approaches to rehabilitation to a building's interior (intervention, insertion, installation) and Leimenspall's eight criteria organized the analysis of each school and helped to pinpoint commonalities. It is through this analysis that the researcher determined that while form, proportion, rhythm, scale, light, material, finish, and detail are affected in the evolution of educational facilities, the retention of a majority of these qualities is critical if the architectural character is to remain. As seen in the renovation of James B. Dudley High School, the majority of the architectural character remained on the exterior. Even with the alteration of the entrance and the replacement windows, the character is still intact but the interior of Dudley High School lost its architectural character and its historical identity. While the auditorium retains some of the original character and the placement of the corridor is the same, the majority of the original 1929 interior was lost during the 2005 renovation. For most of the building there is no retention of the original form, proportion, rhythm, scale, light, material, finish, or detail. If these criteria would have been utilized during the renovation process, the possibility that some of the original architectural character would be retained would be more likely. This is one of the reasons why a study such as this one is important. By identifying examples and addressing how they have evolved as



educational facilities while still retaining architectural character, other designers and school boards that have similar buildings from this era can turn to these model high schools to address how they have retained their intended use throughout the decades. The research also identified how through the utilization of restrained intervention along with the specific thoughtfulness of applying the eight criteria as identified by Leimenstoll to new design elements, a historic high school can evolve and continue to be used while still retaining its original historic character. This research has shown how through all of the changes in educational curriculum and technology, the historic integrity of 1920s high schools can remain.

Through the restrained intervention approach, all of the high schools in this study retained their authenticity in terms of their architectural fabric, their constructed authenticity, and their phenomenological (experiential) authenticity to the community. They are an important part of community memory and identity and their continued role clearly represents today's values based approach to historic preservation because not only is the original fabric being retained but the emotions conveyed in these historic buildings are being preserved. These cherished buildings have been preserved so sensitively because they remain highly valued by their surrounding communities and thus continuing as prominent community icons.

## CHAPTER V

### CONCLUSION

The investigation of the evolution of six 1920's high schools in North Carolina exposed similarities as well as differences in renovation decisions that have been made since the buildings were first constructed. While many of the alterations to the original building were often necessary for continued use of both the building and site as an educational facility, the selected sample highlighted how architectural character can be retained and respected despite change. There were varying degrees of alterations to the character of the buildings in this study, but nevertheless it confirmed that historic schools *can* remain viable without losing their architectural character. Throughout expansions, technological implementations, and a variety of other necessities needed in today's current educational curriculum, school systems need not turn to new building sites for new schools to be built, but can utilize what already exists.

The research that was required for this thesis entailed cooperation from numerous public and private entities. All of the information that was gathered during this study was accomplished by the generosity of those in the field of preservation, education, and architecture. Without the databases from the Department of Public Instruction, National Register nominations from the North Carolina State Historic Preservation Office, plans from both archives and architecture firms, and current photographs that the researcher

was allowed to take, the analysis of each high school would not have been as thorough or comprehensive.

### **Lessons Learned**

The research process was a journey of investigation and learning. While the research goals were met, during this study several important lessons were learned that could be helpful to others interested in this field of study. Even though others were supportive and very willing to lend a hand, the gathering of data took longer than was anticipated. As with most research endeavors, more time is always needed than is anticipated.

The vast amount of material that was gathered and studied for this research goes beyond what could be included in this thesis. Histories had to be learned, plans had to be collected and color coded, historic photographs had to be gathered, and current photographs had to be taken. There was a surprisingly large amount of information that had to be understood in order to comprehend both the historic and present day high school building. The research goals were clearly bulleted in order for the thesis to stay on target since the study of historic school buildings could travel down a variety of different avenues.

Utilizing design criteria to analyze the spaces proved to be extremely helpful throughout this research. The criteria provided a structure for the research and allowed the interiors to be analyzed accordingly. They allowed for the researcher to critically evaluate each high school using a standard method of approach. Some were more helpful

for the research than others but for any research involving the analysis of the built environment, using this criteria was incredibly helpful for organizational and identification purposes.

### **Future Research**

In regards to further research opportunities, there is a plethora of possibilities. The methods utilized in this study met the needs of the research goals but several other methodologies could further enhance this study. If this research were to continue, interviews with people that were directly involved in design decisions could provide insight into some of the choices illustrated in this study. Determining the reasoning behind some of the alterations would answer any questions that arose during this study. This research could expand significantly with the inclusion of interviews.

This researcher would also like to see a quantitative study regarding the number of schools constructed in the 1920s. Comparisons between how many were constructed and what has become of each would provide further context for this study.

Understanding the school building stock of the 1920s would help address problems as well as praise achievements in continued use. As stated before it is better to keep the original use of a historic building intact whenever possible, but any utilization of a historic building is better than having a building vacant, forgotten, and left to ruin.

It is the researcher's belief that the fact that these six high schools have survived as high schools nearly 100 years is an achievement that should be celebrated. The survival of Roanoke Rapids, Richard J. Reynolds, Asheville, Greensboro (Grimsley),

James B. Dudley, and Needham B. Broughton High School has been possible by work from preservationists, architects, school administrations, alumni, and supportive communities. As witnessed during site visits, the love of the community surrounding these high schools is apparent. Community engagement has been a part of these high schools since their construction. A combination of professional expertise and strong community support has resulted in the successful retention and ongoing vibrant life of these historic high school buildings. Built in the 1920s as icons for the surrounding community, they remain cherished community icons today.

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