#### DE ZAVALA CHARTER SCHOOL

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Bachelor of Architecture

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#### DE ZAVALA CHARTER SCHOOL

# AN ANALYSIS OF THE IMPACTS OF THE BUILT ENVIRONMENT IN EDUCATIONAL SPACES

Savannah Tidwell Spring 2022

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#### INTRODUCTION

Education is considered to be one of the most important rights in the modern world. From the day a person is born, they begin to learn, and therefore, receive an education. That education is not always formal, and society has evolved from learning from their families to learning in a more traditional environment. There are varieties of schools, educational systems and strategies, and to go with that, there are also different learning types and styles. In the modern world, there are so many choices presented to both parents and children, and there are multiple factors that determine the level of education one may receive. These include but are not limited to: wealth, location, religion and what the parent typically feels is best for the child.

Not everyone is so lucky to receive high standards of education. In this particular thesis, primarily American educational facilities will be analyzed, and the intent is to improve the standard school. What can we do, as adults, to provide the best for the future of our world, the children? At this moment, over 48 million students are enrolled in schools. That is 14.8% of the United States population. A hefty chunk, and that doesn't include children enrolled in private schools, religious schools, montessori schools, or those who are homeschooled.

The question must be asked plainly: Why does architecture matter in an educational setting? Isn't it enough for the youth to just go into school and do well, regardless oftheir space? The short answer to those to that is NO. It is no longer enough, and truly never has been. We cannot expect younger generations to pull through whatever is thrown at them in the real world if the education they have received is insucient. We can no longer ignore the facts, those that state that a space has a tremendous impact on whoever occupies it. This is the same for schools. Many schools are built on the cheap, often by architects who also specialize in the design of prisons. That in itself is an insane notion. Why should students, at any age, be treated like inmates? Why should they be herded into classroom after classroom, talked at, lectured to, and then expected to perform well on standardized testing? As our society in America evolves, so must our educational standards and settings. The proposed design of De Zavala Charter School is one that will go above and beyond the highest standards of design and consideration for students and their faculty.

#### THE CURRENT STATE OF EDUCATION IN AMERICA

Unfortunately, many of these education styles are outdated or poorly delivered, thereby resulting in a lower quality of education. This then can provide limited choices for a person as they grow into adulthood and are faced with the stark realities of the world.

The United States, for example, has a terrible system. As blunt as this may seem, it is true. When compared to our European or Asian counterparts, the performance of American students is far behind comparable students. We are seeing a huge increase in the outsourcing of many jobs & careers in many sectors, namely information technology and manufacturing. The United States outsources a whopping 68% of services to other countries around the globe.

How does this relate to education? How does it relate to the architecture of educational facilities? The answer is simple. Education of young Americans directly impacts what career they will eventually decide upon, and the built environment directly impacts the person's experience. If the experience is a negative one, the association will directly influence that person's life choices. Negative environments stifle an individual's creativity, their imagination, and most devastatingly, their full potential. In contrast, a positive environment will uplift students, excite them, and inspire them. This also has a huge impact on the adult faculty who work at the building for many years. If children shouldn't be sujected to dark, dim environments, then why should a teacher or faculty member be subjected to that exact same environment for years, potentially decades? They should not. School is meant to be a safe, inviting and exciting space, and that begins with the very buildings that serve the purpose of an educational facility.

It is a most curious question as to why the United States of America, the supposed biggest and best country in the world, focuses so very little on schools and the pupils within them. Why should funds be allocated into private or niche interests, when the literal future of the country is sitting in the dimly lit rooms, being taught lessons that rarely prepare them for their futures? Why should the teachers, who sacrifice time to a myriad of extra responsibilities, have to pay for necessary supplies? Providing funds for these educational buildings is directly helping the teachers provide a better standard of education, which in turn helps students succeed, and give them the starting push to go on and achieve great things. This benefits both the individuals and our country as a whole.

#### How the U.S. compares on science, math and reading scores

Average scores of 15-year-olds taking the 2015 Program for International Student Assessment

 Score is significantly
 Score is not significantly
 Score is significantly higher than U.S.

different from U.S.

lower than U.S.

Sc	ience	Mathematics		Reading	
Singapore	556	Singapore	564	Singapore	535
Japan	538	Hong Kong	548	Hong Kong	527
Estonia	534	Macao	544	Canada	527
Taiwan	532	Taiwan	542	Finland	526
Finland	531	Japan	532	Ireland	521
Macao	529	South Korea	524	Estonia	519
Canada	528	Switzerland	521	South Korea	517
Vietnam	525	Estonia	520	Japan	516
Hong Kong	523	Canada	516	Norway	513
South Korea	516	Netherlands	512	Macao	509
Slovenia	513	Finland	511	Germany	509
New Zealand	513	Denmark	511	New Zealand	509
Australia	510	Slovenia	510	Poland	506
Germany	509	Belgium	507	Slovenia	505
Netherlands	509	Germany	506	Netherlands	503
United Kingdom	509	Ireland	504	Australia	503
Switzerland	506	Poland	504	Denmark	500
Ireland	503	Norway	502	Sweden	500
Denmark	502	Austria	497	Belgium	499
Belgium	502	New Zealand	495	France	499
Poland	501	Vietnam	495	United Kingdom	498
Portugal	501	Australia	494	Portugal	498
Norway	498	Sweden	494	Taiwan	497
<b>United States</b>	496	Russian Fed.	494	United States	497
France	495	France	493	Spain	496
Austria	495	United Kingdom	492	Russian Federation	495
Sweden	493	Portugal	492	OECD average	493
Spain	493	Czech Rep.	492	Switzerland	492
Czech Rep.	493	Italy	490	Latvia	488
OECD average	493	OECD average	490	Vietnam	487
Latvia	490	Iceland	488	Czech Rep.	487
Russian Fed.	487	Spain	486	Croatia	487
Luxembourg	483	Luxembourg	486	Austria	485
Italy	481	Latvia	482	Italy	485
Hungary	477		479	Iceland	
Croatia		Lithuania		Luxembourg	
Lithuania	475	Hundary			479

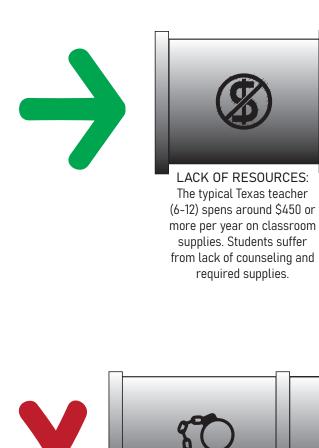
As seen in the graphic, the U.S. is clearly far behind in the three flagship subjects, either just barely above the international average, or in the case of mathematics, far below.

### THE SCHOOL TO PRISON PIPELINE: THE ROLE OF THE BUILT ENVIRONMENT

One of the most interesting impacts of negative school environments is the unfortunate recurrence of the school to prison pipeline. As the years go by, this phrase has become more and more prevalent, especially with the shift in the realm of current civil rights movements. While the social and community impacts have been devastating in recent years, it has spawned important conversations in many different areas of concern, one of those being the educational domain. One of the wonderful things that the United States provides is a right to free, public education up to the 12th grade. In theory, this is a fantastic way to level the playing field between citizens and provides our countrymen with the tools to build a better life for themselves, their families, and their communities.

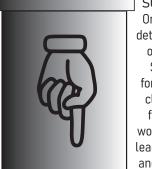
In practice, however, this system is riddled with disparity, inequality, and unfairness. This is extremely obvious in the case of minority communities, where schools are poorly funded, poorly staffed, and most importantly in this case, poorly designed. These negative environments are where many children of low-income minorities spend a vast majority of their time. From the very start, these children are at a huge disadvantage to their wealthier counterparts in other districts and states. Policies implemented, such as the infamous "Zero Tolerance" and the "No Child Left Behind Act" have immense detrimental effects on these young people. To quote the American Civil Liberties Union: "'Zero-tolerance' policies criminalize minor infractions of school rules, while cops in schools lead to students being criminalized for behavior that should be handled inside the school. Students of color are especially vulnerable to push-out trends and the discriminatory application of discipline."

This then subjects those students, who are often targeted, to punishment. Punishment can vary from in-school suspension, to detention, out-of-school suspension, and harsher forms, such as alternative 'disciplinary schools' or just being outright expelled. This does not help the students, many of whom already have difficult home lives and often already suffer punishment there as well. Expelling a child has no positive effect. It causes them to fall behind on coursework, it leads to isolation and also becomes a breeding ground for dangerous activity when they are not present in the classroom. In the case of poorer, high-crime communities, the children there are subjected to even worse influences, often leading to dropouts and lives of criminal activity.





OVER DISCIPLINED:
Thanks to "Zero Tolerance" policies developed in the 1990s and early 2000s, students are severly punished for minor infractions.
Students of color are also more 2-5 times more likely to be discplined.



SUSPENSION:
One of the most
detrimental forms
of "discipline".
Students are
forced out of the
classroom and
fall behind on
work, which often
leads to acting out
and then harsher
forms of discipline.





Finally, many of these former students end up incarcerated for varying degrees of crimes. 65% of the prison population do not have highschool diplomas.



LEFT OUT:

As a result of being forced out of the classroom and subsequently falling behind,
students are either forced to repeat classes,
end up in the juvinile detention system, or
just drop out altogether. This often leads them
to seek other solutions, most of which are
dangerous and illegal.

That is where the term 'school to prison pipeline' has come from. Troubled kids go from bad school environments to worse external environments, to juvenile detention and finally to prisons, where they go in and out of. With little education, there is also little hope for people who have suffered this hand in life. Before they know it, their lives amount to little to nothing, because they were never given the proper environment to succeed in.

It can be argued, of course, that schooling and the environment that hosts it doesn't prevent criminals, gangs, or illicit activity. For many people, it is nearly inescapable. However, it is clear that education and positive spaces mitigate and counteract negative influences. Forcing young people away from those environments is by no means the solution, and if they have a safe, welcoming space to find refuge in, then they will have the opportunity to make better choices. Positive environments provide the foundations of success, and one cannot build without a strong foundation.

# COMPARE & CONTRAST

While traditional ISDs and charter schools are both considered public schools, each system shares similarities and differences with one another.

#### Traditional ISDs

- ∅ No enrollment cap
- Receive local property tax revenue
- Board members are elected
- Cannot release students for behavior issues

#### Both

- **6** No tuition costs
- State funding is based on average daily attendance
- Open meetings and open records

#### **Charter schools**

- **⊘** Enrollment cap
- Receive no local property tax revenue
- Board members are appointed
- Can release students for behavior issues

SOURCES: TEXAS CHARTER SCHOOL ASSOCIATION, TEXAS EDUCATION AGENCY/COMMUNITY IMPACT NEWSPAPER



## CHARTER SCHOOL VS. PUBLIC SCHOOL

The primary reason for choosing a charter school was the freedoms that charter schools have when compared to traditional schools within a school district. Charter schools allow for more flexibility and are less limited when it comes to designing spaces. A charter school also has the benefit of not being bogged down by outdated regulations, and also allows for more freedom of cirriculum. Students who attend charter schools are introduced to a structured but relaxed environment that has faculty who truly wish to see them excel. It also allows for the mitigation of student population, which helps teachers keep class sizes far more manageable than that of a traditional ISD school.

#### **SOLUTIONS AND STRATEGIES:** THE 3 PILLARS

Many experts are proposing a variety of solutions, such as studying and implementing different teaching styles or education styles. The architecture is meant to be supportive and versatile of any and all styles. There are also a variety of outside factors to consider when designing a school. Both exterior and interior factors are to be considered in the design of De Zavala Charter School. They have been divided into three main categories:

- 1. Security
- 2. Visibility
- 3. Positivity









**ENVIRONMENT TOLERANCE** 

SAFE

**SPACIOUS** 

**ENVIRONMENT** 

**BALANCED EXPOSURE** LIFESTYLE

LINES OF SIGHT

**ENCOURAGING** SOCIAL **INTERACTION** 

**ENGAGING ENVIRONMENT** 





**PREVENTION** 

SAFE ENVIRONMENT

**TOLERANCE** 

#### PILLAR ONE: SECURITY

The first pillar is SECURITY. The balance must be struck between having a secure environment and making that environment still positive to be around. This is organized into the three sub-classifications of prevention, safe environment, and tolerance. Prevention begins quite literally at the door- by reducing the number of major entrances, external threats can be mitigated. Unfortunately, the United States has been plagued by school shootings more and more frequently as the years have gone by. According to everytownresearch.org, K-12 schools are victims of 63.2% of gun related violence on campuses. Mitigation of external threats starts by making sure that they cannot enter the building. If they do, providing spaces where students can retreat and make a safe exit is also essential. De Zavala Charter School limits major entrances, and the circulation of the building as a whole actively shields students from trespassers. This would be called "The Barn Door Policy". While there is a multitude of curtain walls for visibility and internal sightlines, there would be physical mechanisms to protect students and faculty alike. This provides for the second sub-class of Safe Environment. Students will still feel comfortable in the environment on a day to day basis, but in the event of an emergency or crisis, the building would protect them. Finally, the third subclass of Tolerance would primarily be fulfilled by the security officers and administration responsible for the students. The proposal would be plainclothes or less intimidating uniformed security officers, who are still armed appropriately- but they would be far less intimidating than a typical officer in uniform. Tolerance would further be enacted by not targeting students for petty incurrences, such as minor tardiness or minor behavioral issues. This would foster a culture that is tolerant but strict where needed. As discussed earlier, the over-disciplining of students only sets them up for failure later down the road.



LINES OF SIGHT

SPACIOUS ENVIRONMENT

**EXPOSURE** 

#### PILLAR TWO: VISIBILITY

The second pillar is VISIBILITY. Visibility in this instance is defined by the three subclassifications of providing physical lines of sight, spacious environments, and exposure. Physical sight lines are useful in multiple instances, primarily for faculty. If a teacher is able to see students, they are able to quickly intervene if an altercation arises, thereby tying right back into security. It also provides students with this same ability, giving them the comfort of knowing that there are people around and helping build stronger educational communities. This also goes hand-in-hand with exposure, as students are far less likely to misbehave or do something rash if they know that they will be seen doing so. These are just some of the many benefits that high visibility in the built environment offers. De Zavala Charter School fulfills this pillar by having a great many curtain walls for ease of viewing between major areas of the building. This fosters creativity and community, by allowing students to physically look around and become immersed in their educational settings. It is also not simply internal, but external as well. By allowing students the capability to look out of a window, it helps stimulate the brain. This is further backed up by Melina Uchaper, who wrote about the positive "cognitive reset" that is gained by external views. Many of the classrooms offer external views from the classrooms, allowing students to take full advantage of this.



ENCOURAGING SOCIAL INTERACTION

ENGAGING ENVIRONMENT

BALANCED LIFESTYLE

# PILLAR THREE: POSITIVE ENVIRONMENT

The third and final pillar is positivity. Students are shaped by their environments and the resulting factors of that environment for their critical developmental years. If that environment does not foster the positivity and creativity that young people need, they will suffer later, and in turn, our society will also suffer. Positive environments are divided into the following 3 subclasses: Building social skills, engaging environments, and balanced lifestyles. Social skills are at the root of every interaction people have, and developing those skills positively gives adolescents a head start on many aspects of life. Carrying good conversation, engaging in group activities, and also taking time to take care of oneself are all essential aspects of building social skills. De Zavala Charter School has so far secured the building, made things visible, and now also provides a variety of positive spaces for students to interact with and it. Floors are not just for classrooms and hallways, rather there is an increased net-to-gross ratio of public spaces between classrooms to provide students (and their teachers) with versatile areas to learn and grow in. This is both internal and external. The green roofs that occupy each level provide outdoor space for teachers to bring their students out onto, perhaps for some nice reading in the sunshine or to perform messy, exciting experiments. For internal spaces, many of the floors offer central gathering spaces that can be used for larger, multiclass lessons or group work outside of the classrooms. The faculty also have their own lounges on each floor, allowing them to retreat from the more public setting of the classroom. There are also 'common rooms' on each floor, meant for more private interactions between students. These spaces allow for relaxation, a spot to socialize, or catch up on homework. All of these fall under the umbrella of the second subclass: engaging environments. Versatile spaces provide students and their teachers this engagement. De Zavala Charter School also provides students with a balance through these spaces, along with the more communal spaces on the ground floor.

# **PRECEDENTS**

#### Barnard College Diana Center

Architect: Weiss/Manfredi

Year Built: 2010

Key Aspects: Built on an urban site, this facility encompasses the high visibility desired, along with the strong vertical circulation required of the small site. It also has a variety of programming similarities with De Zavala Charter School.







#### Blakely Elementary School

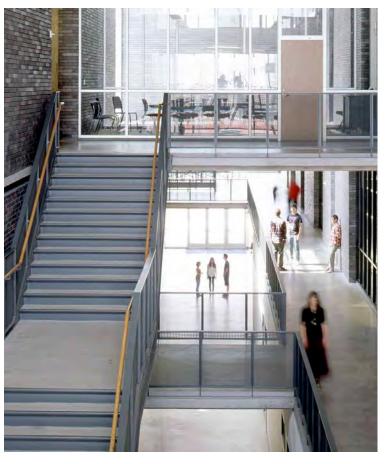
**Architect: Mithun** 

Year Built: 2020

Key Aspects: The school has a heavy focus on community spaces and openess. The 20 classrooms are placed in groups of 4, defined by L-shaped footprints. This allows for high visibility and encourages social interaction.











# Booker T. Washington High School PVA

**Architect: Allied Works Architecture** 

Year Built: 2008

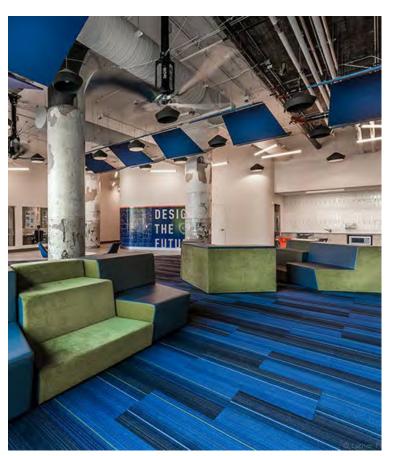
Key Aspects: This urban school has a heavy focus on vertical circulation due to a smaller site. It is a pioneer in organization of spaces and visibility.

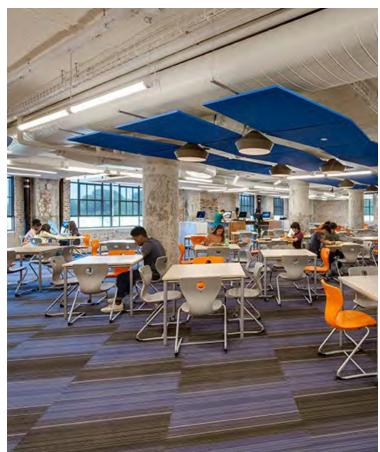
#### Crosstown High School

**Architect: ANF Architects** 

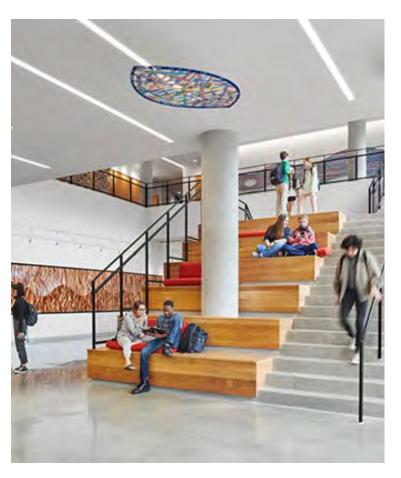
Year Built: 2017-2018

Key Aspects: Situated within a multipurpose building, this school takes advantage of the vertical circulation by using curtain walls to increase the level of natural light and overall visibility.













#### Kinder HSPVA

Architect: Harrison-Kornberg

Year Built: 2018

Key Aspects: Another urban school in downtown Houston, TX, which also serves a multitude of programs. With a heavy focus on the arts, the program defines the circulation and spacial experience sectionally.

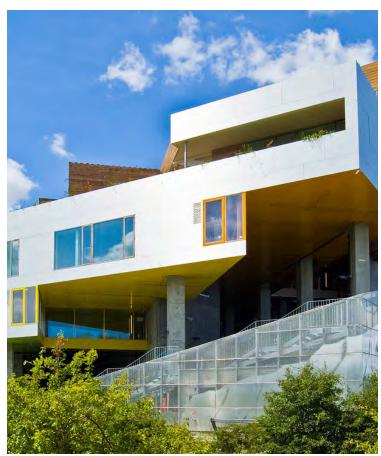
#### Mountain Dwellings

**Architect: BIG** 

Year Built: 2008

Key Aspects: This residential building inspired the green roof and terraced design of De Zavala Charter School. By using the terraced massing shape, the dwellings take advantage of the solar orientation to naturally light the units.













# Rockwell Integrated Sciences Center

**Architect: Payette** 

Year Built: 2019

Key Aspects: This center was designed from the inside out, which also inspired the De Zavala Charter School design. Elements borrowed from this precedent include the tall curtain walls and varying outside facades.

#### Elgin High School

**Architect: Unknown** 

Year Built: Estimated 2005

Key Aspects: This school embodies much of what De Zavala Charter School hopes to avoid. Lack of exterior windows, limited parking and overall a depressing facade complete an architecture that is better left in the past.







#### WHAT'S IN A NAME?

The original name for the proposed school wasn't De Zavala Charter School, however it was decided that a namesake for the school should hold more meaning than just a random choice. For that reason, the school is named after Adina Emilia De Zavala. De Zavala was a native Texan, born in Harris County in the year 1861. The eldest of six children, she became a teacher in 1884 after graduating from the Sam Houston Normal Institute and an unnamed music school in Missouri. She is most notable for her works in the preservation of various missions around Texas, especially the San Antonio de Valero Mission, better known as the Alamo. Without her dedication to preservation and education, the Republic of Texas and the now State of Texas would be far different to what it is today. This project hopes to honor De Zavala by continuing her mission of education into the modern age.





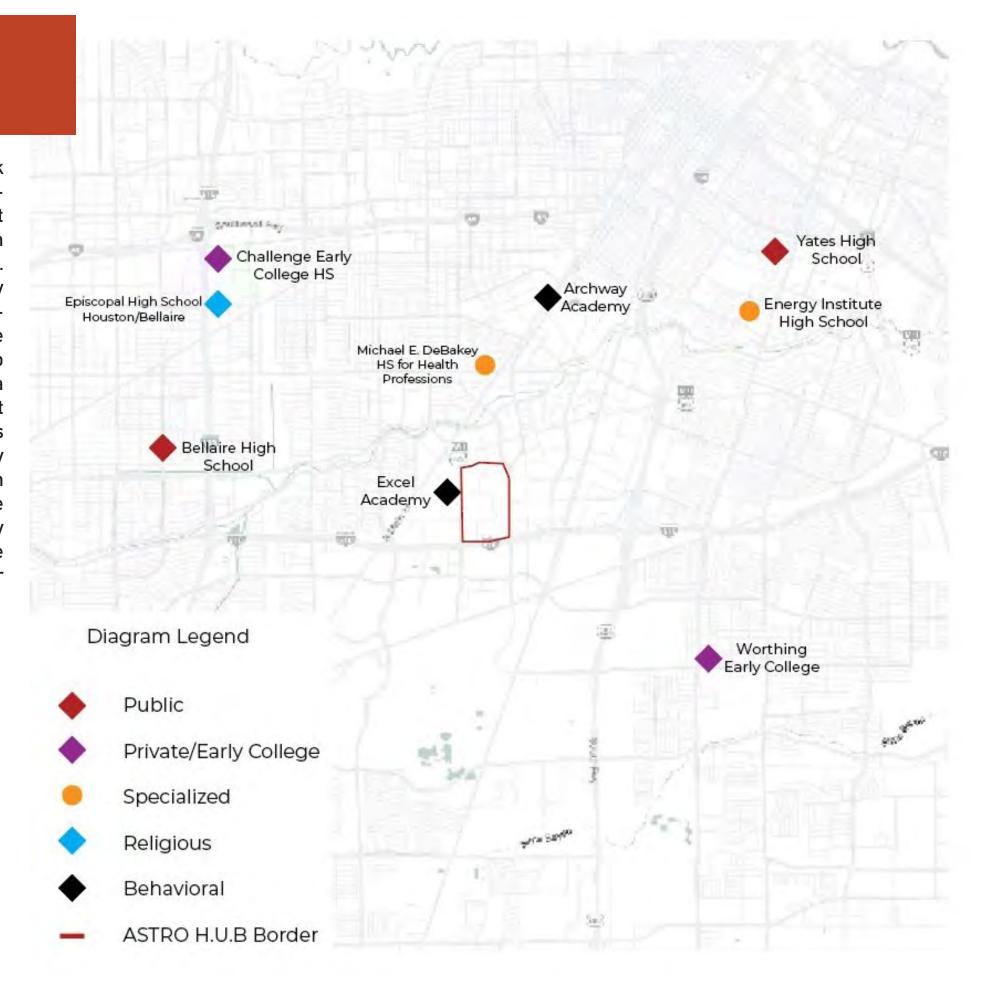




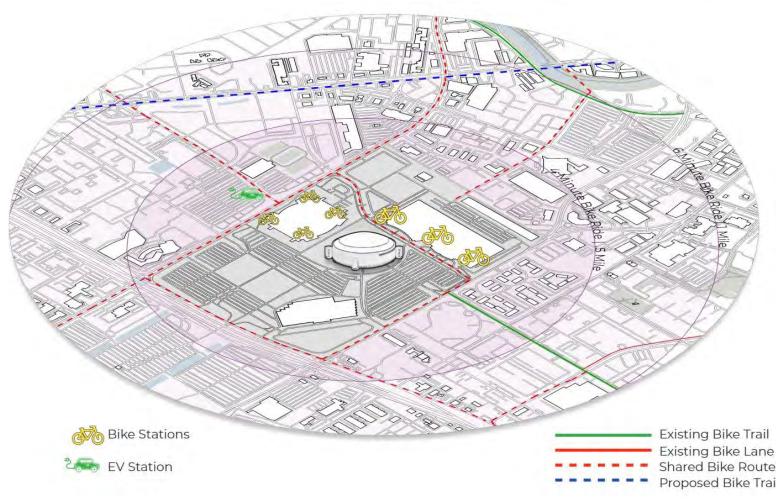
#### Going the Distance

Students should not have to traverse difficult terrain, trek great distances, or sneak through dangerous areas. Access to education starts with physical distance, not just the mere existence of it. To the left is a diagram with markers illustrating the location of nearby highschools. There is a grand total of nine schools, but this can be very deceiving. For the nearest example, there is Excel Academy. To the untrained eye, this would seem the ideal place for residents of the ASTRO H.U.B to send their children to school. A hasty assumption, as Excel Academy may be a charter school like the proposed, but it is for students that have been expelled or have severe behavioral issues. It is not open to the public for those reasons. In fact, the only schools that are actually public would be Bellaire High School and Yates High School. Both of these schools are 4 to 5 miles away, which is mundane in a car, but a hefty commute by public transit. Other surrounding schools are either private or specialized schools, making the need for another school relevant and necessary.





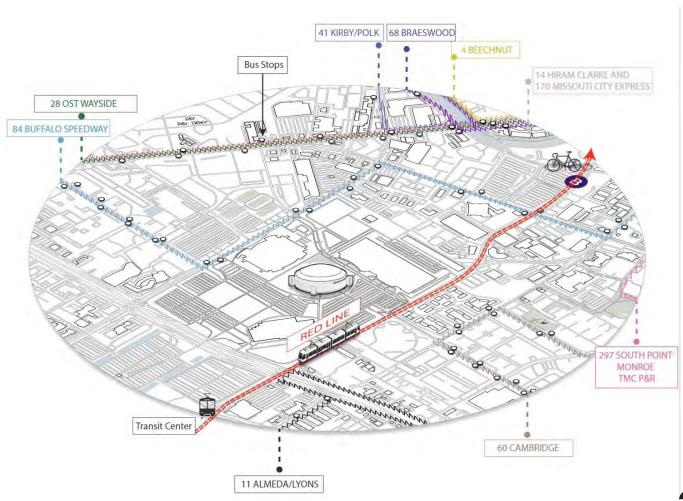
# Access points Bridges Amerial Boads Highways Major Circulation Minor Highway



#### **Getting Around**

Of course, it wouldn't be realistic to assume that all of the students would come from only within the site, but also from around it. There are a variety of bus routes, light rail, and roadways that lead straight into, through and around the site.

Also, the Astro H.U.B would be re-routing Line 84, Buffalo Speedway to go through the neighborhood instead of around it. This would provide better access into the site overall and easier to navigaete for students of De Zavala Charter School.

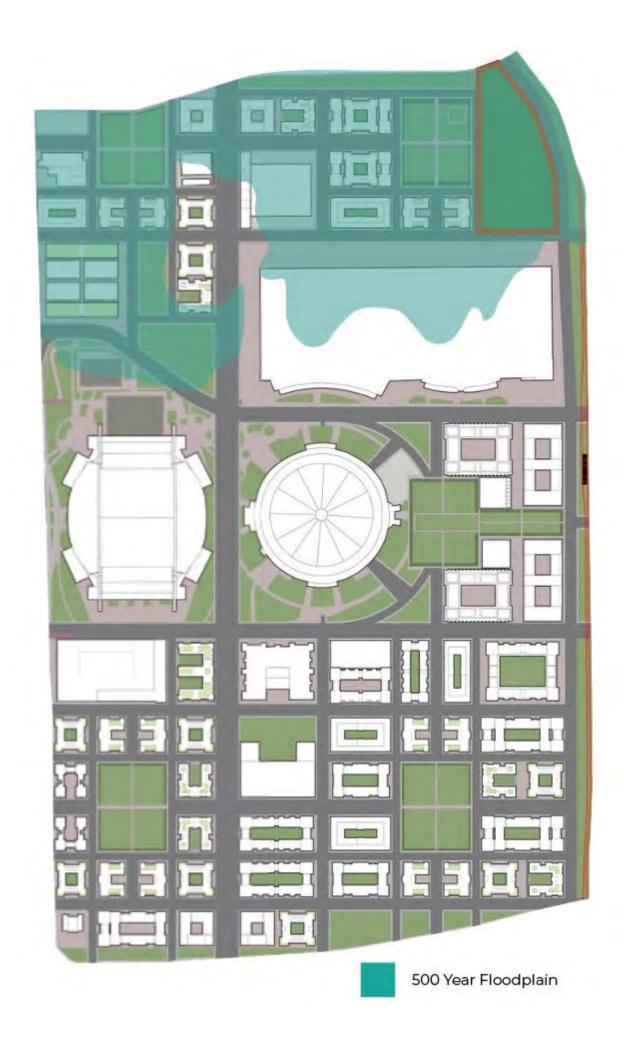


# Welcome to the AstroHUB

De Zavala Charter School is located in the Astro-HUB site, an urban design project located in the NRG Park of Southwest Houston. This location would be home to 20,000 new Houstonians and 10,000 jobs.

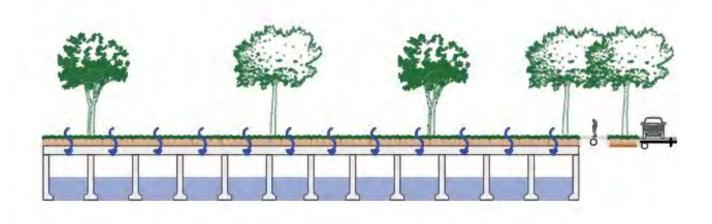
The school itself would be situated on the northeastern corner of the site. This provides an anchor for the site, along with ease of access for external deliveries and faculty who may live outside of the Astro-HUB.





#### Rising Waters

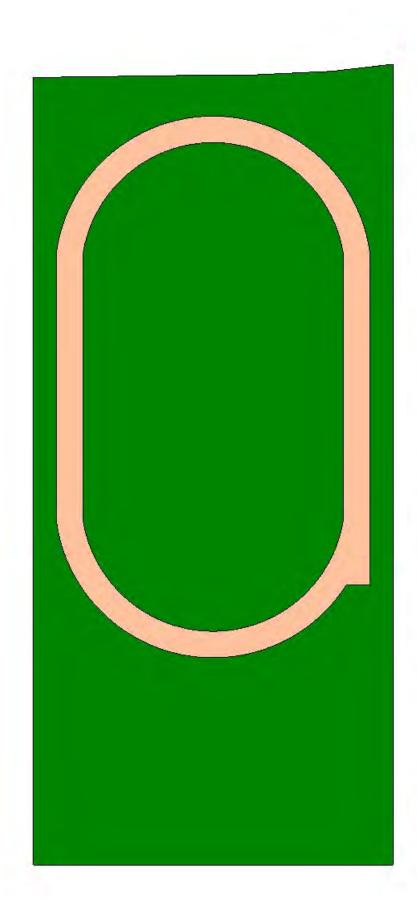
Floodplains are as big of a presence as ever. With the records set by Hurricane Harvey in August 2017, Houston's architecture must be prepared for disaster. Since the proposed site lies within the 500 year floodplain, it will be raised, at minimum, to a height of 6 feet. Across the street will also be a green that will also act as a retaining pond, holding thousands of gallons under the soil. This will hopefully be enough to prevent the school from ever experiencing floods, but it is an uncertainty faced as the climate continues to change rapidly.

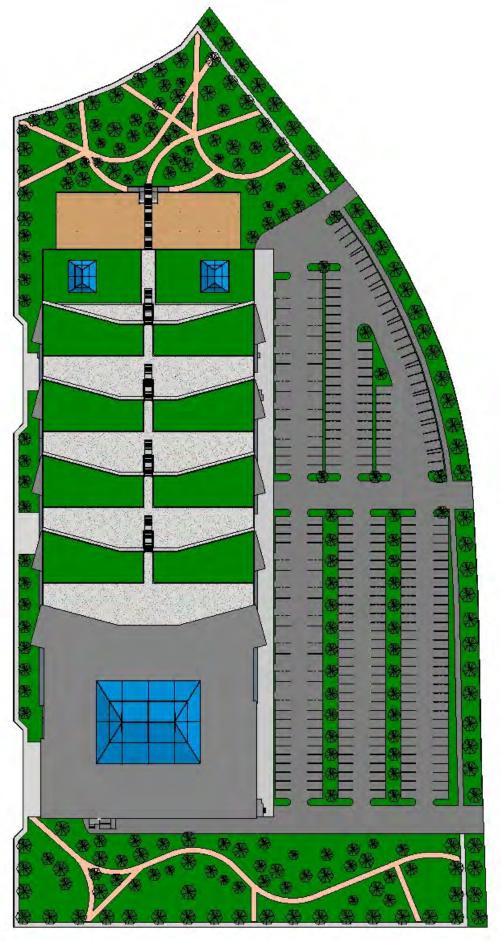


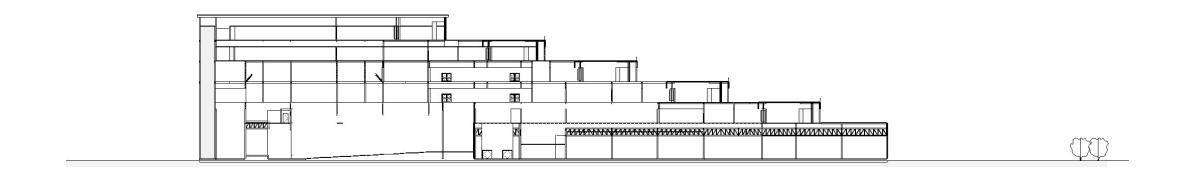
An idea for the further retainment and drainage of floodwater was alluded to earlier, and that would be executed through the installation of a cistern beneath the green space. This cistern could hold and drain excess water in the case of flooding. This would also for the recycling of water from the green after the landscape is watered.

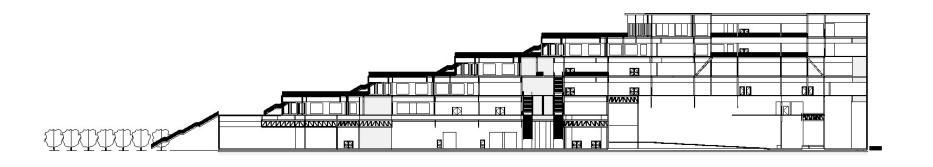
# The Site

The site is approximately 7 acres, not including the football field and future athletics annex. The primary parking is situated on the eastern side, providing a barrier between the main building and the light rail system that runs adjacent to it. Both the north and south sides are landscaped for the enjoyement of the students and the faculty, bringing in a bit of natural space in an otherwise very urban context. The trees also act as barriers from the roads. There are two bus stops along the private main road, allowing students easy access to the building. The primary and visitor entrance is the central, allowing for the proper check in of parents and other outside visitors.





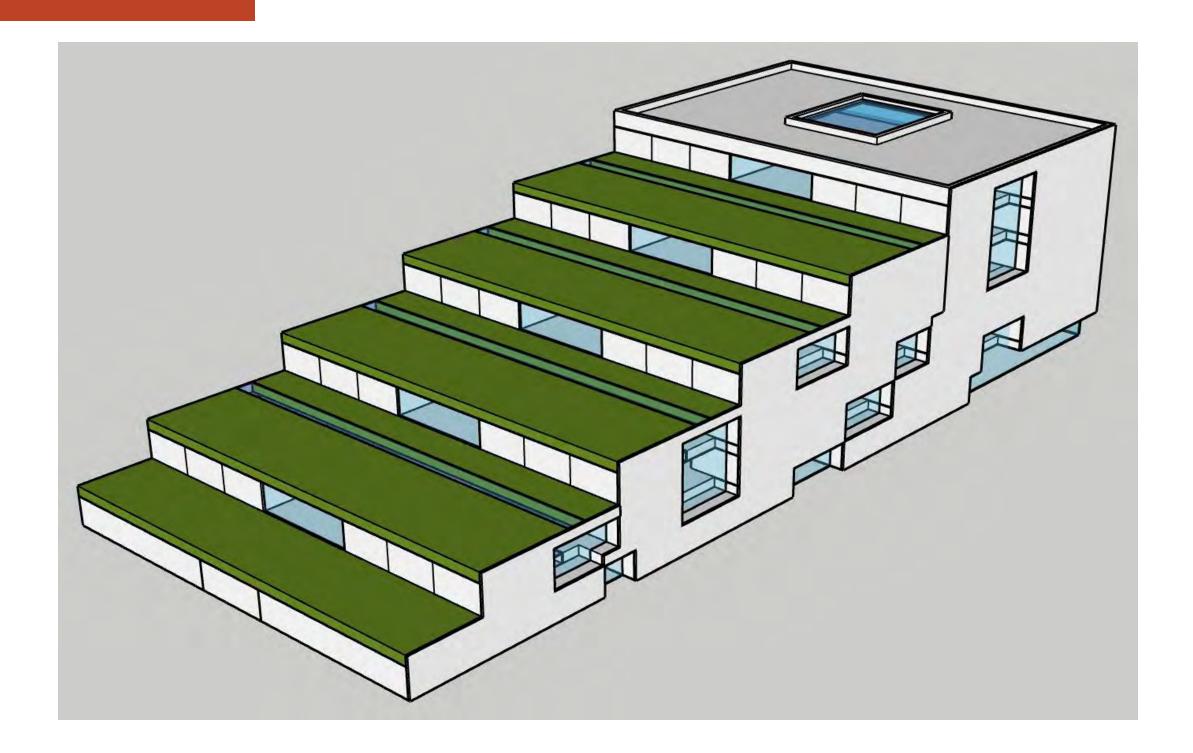




#### Lighten Up!

Rupti que lab illuptature lam, occulla utasperum endusam etum ex exeruptatur minis derci sitiamusam res dolorendamus solorerem cum est, optae venecum qui te omnihitibus et volore, ipsunt et eum, ommolup tatiis maxim eossintem nem. Nempero viditaspid modit undenda ndictota ipis dolupta ereprate re solorem eiundigenis nonsequas quo corestium exceptae et quideleni ut aborerciam, ventiis sequatiis atae veleste sciendem fugitatiant dercips aperessi blabo. Daessit es ea solut eaqui dolor aut quo mo etus di aut adipsan itincturem. Este que sunt, officipit, sint aliam laborest, omnit, et, officatur, nos ilis modi rest, occulpa sit, cuptas corporibus dolupiendani doluptatur magnisq uidunt eveliaspe prat evelenimus ut harcim volore explicabo. Agnis alis ipsae pos ex et que pos voluptatum eum soluptatque con conem hillore perspiet ma sitatio temporepe pliquis moloreic te landus.

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#### THE PROGRAM

#### **Total Student Body: 1,200**

6th Grade: 172 9th Grade: 172 7th Grade: 172 10th Grade: 170 8th Grade: 172 11th Grade: 172 12th Grade: 170

#### **Total Classrooms: 60**

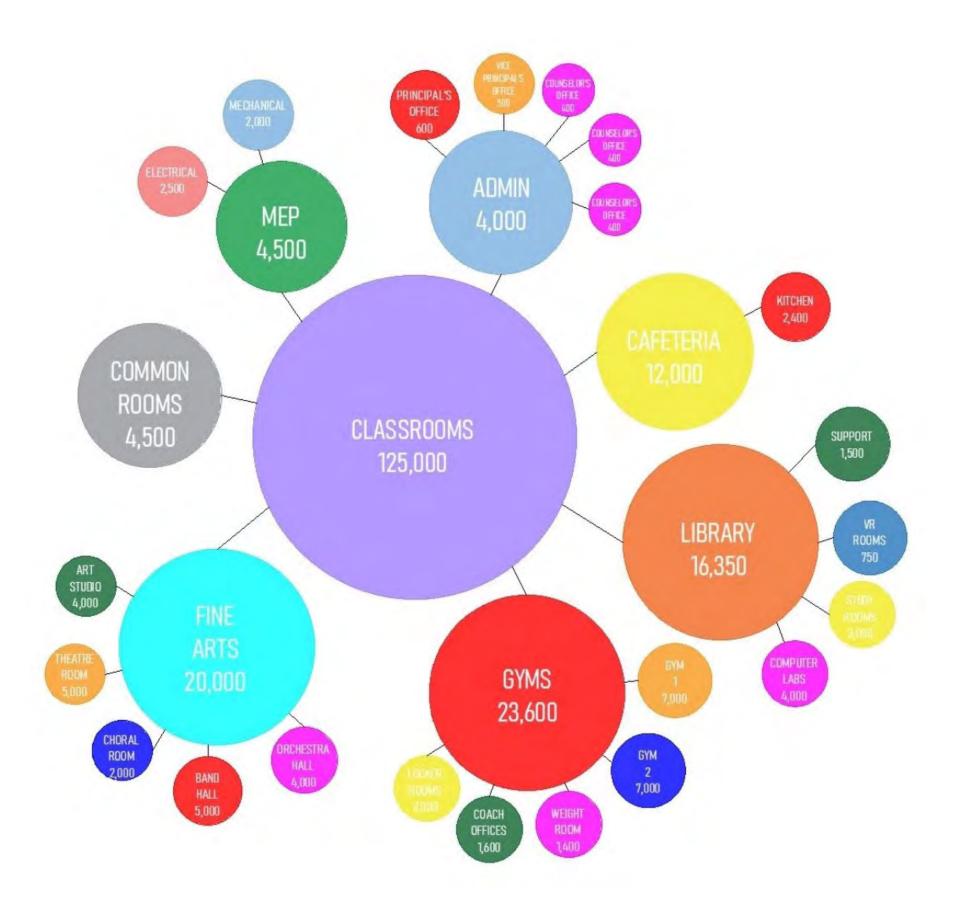
There are roughly 20 students per class, with each student having 50 square feet of space. The TEA standards state a minimum of 35 per student.

#### **Total Faculty & Staff: 130**

Teachers: 86

Administration: 13

Service: 31



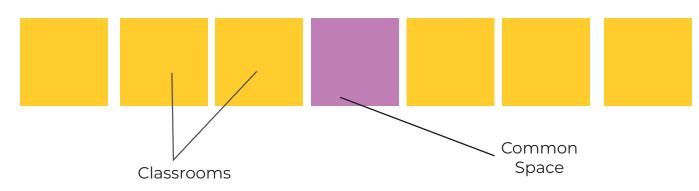


The roof top terraces also offer a variety of spacial experience for faculty and students a like. Getting in touch with nature and sunlight has proven to be very beneficial for younger folks especially. These different spaces allow teachers to engage with their students in a more diverse way, providing the students with new experience and fresh air.

# Steady Start: The Importance of Strong Social Ties

Humans, by our very nature, are extremely social. From the very first tribes in Africa to the kindreds of the Vikings, people are meant to be with other people. Most children are introduced to others in their preschool years or maybe in nurseries. School is an important place not only for learning about subjects, but also about building relationships. These relationships vary from friendships to mentorships, and as people grow older, romantic relationships. This is also directly influenced by the spaces one is surrounded by and occupies.

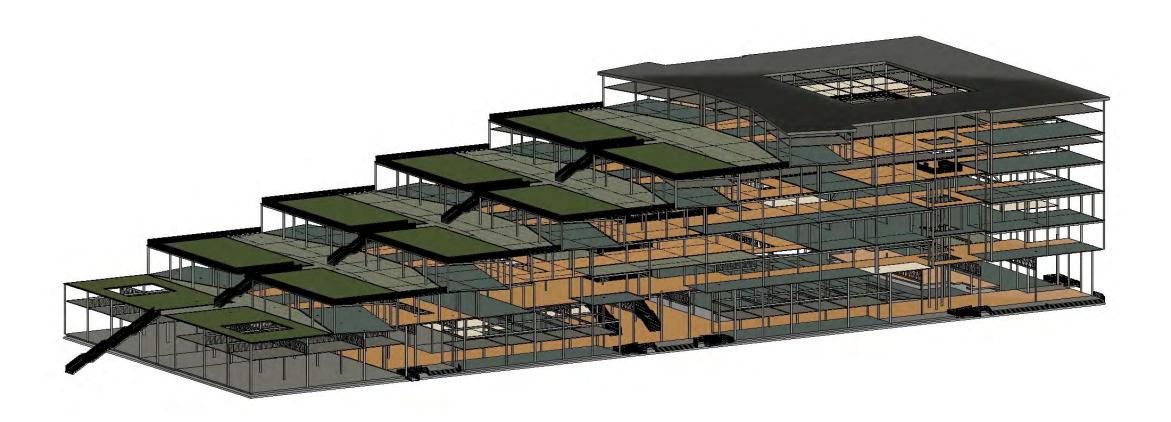
Educational space is best utilized when it encourages healthy socialization. This can come in many forms, some as simple as visibility to other classrooms, or to more interpersonal interactions, such as teamwork. The space must be adaptable to all kinds of situations and scenarios, allowing students and faculty versatility in their respective roles. There are just so many things to consider, especially when security is added to the list. How can designers provide visibility but also protect from intruders?

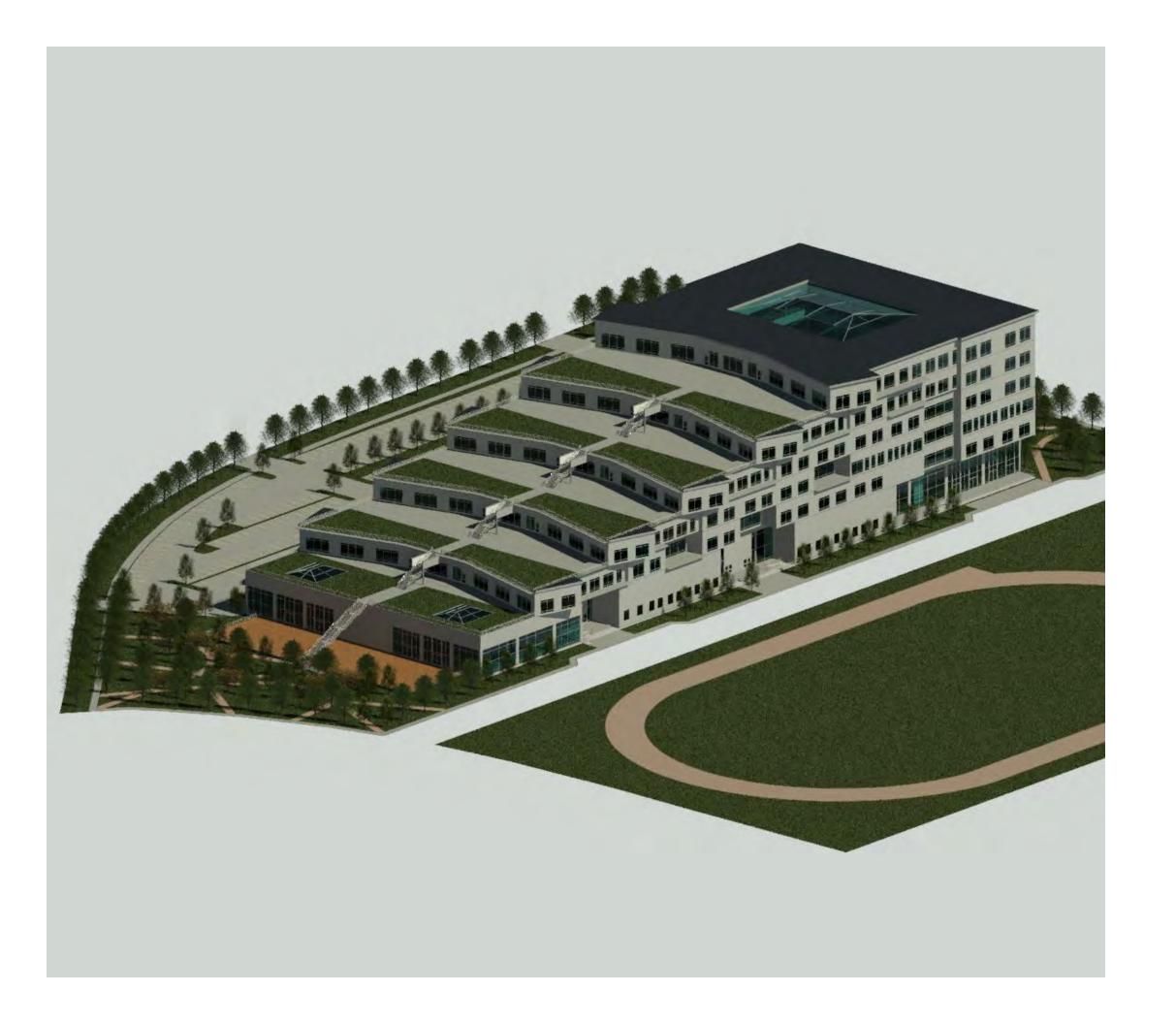


De Zavala has taken inspiration from the state schools of the United Kingdom. In many schools, upper year students have common areas or rooms that are utilized during breaks, lunches and for afterschool activities. The common room has started to migrate over the pond to the United States, but is nowhere near as widespread. It allows students a space separated from the classroom, with no obligation to pay attention. They can be used for homework, study sessions, or even something as simple as just taking time to relax.

# Structurally Sound

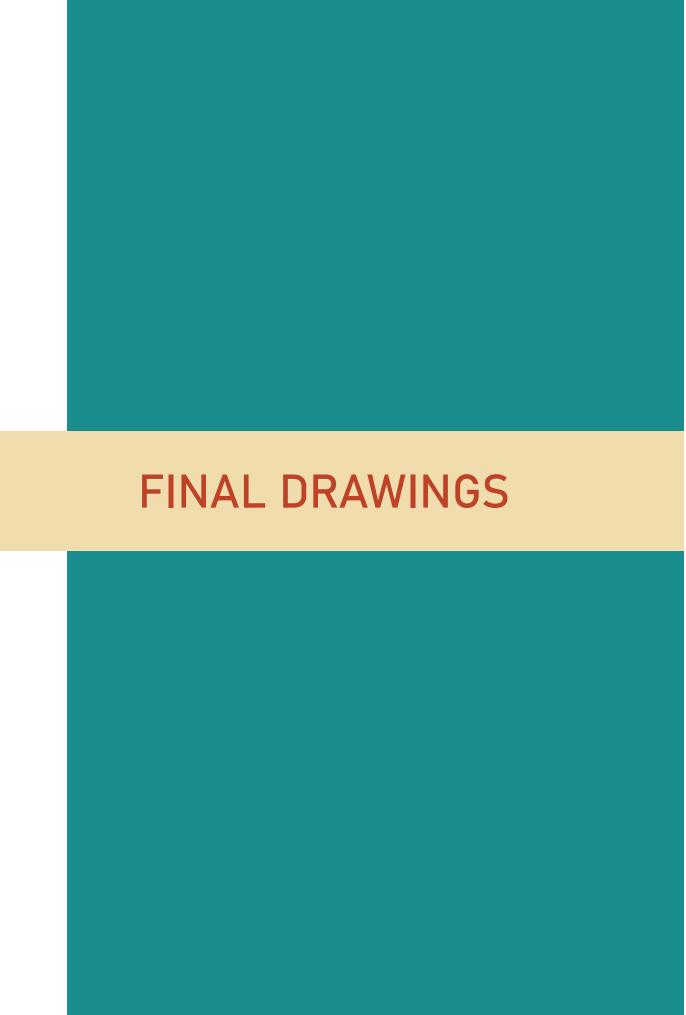
De Zavala Charter School is a steel construction building, with a variety of trusses and HSS columns. While not the most environmentally sustainable material choice, steel will last decades. It was also the necessary choice for the structural integrity of such a large structure, and also provides more floor space for the occupants.





# Environmentally Sound

The green roofs also serve as a carbon sink, along with the many trees on the site. They also act as cooling strategy for the building overall. The building will also utilize solar panels to help reduce external energy usage.



# Floor Plans



1, 2. 3 LEVEL FLOOR PLANS

34

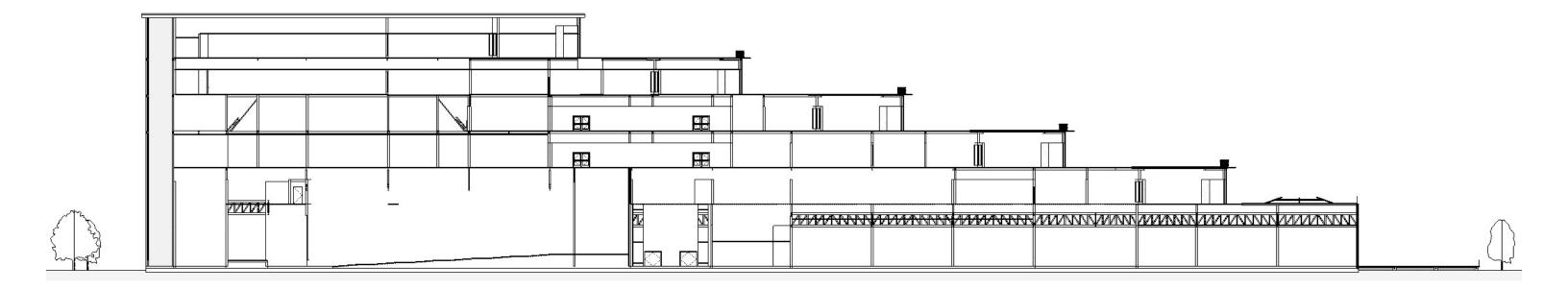
# Floor Plans



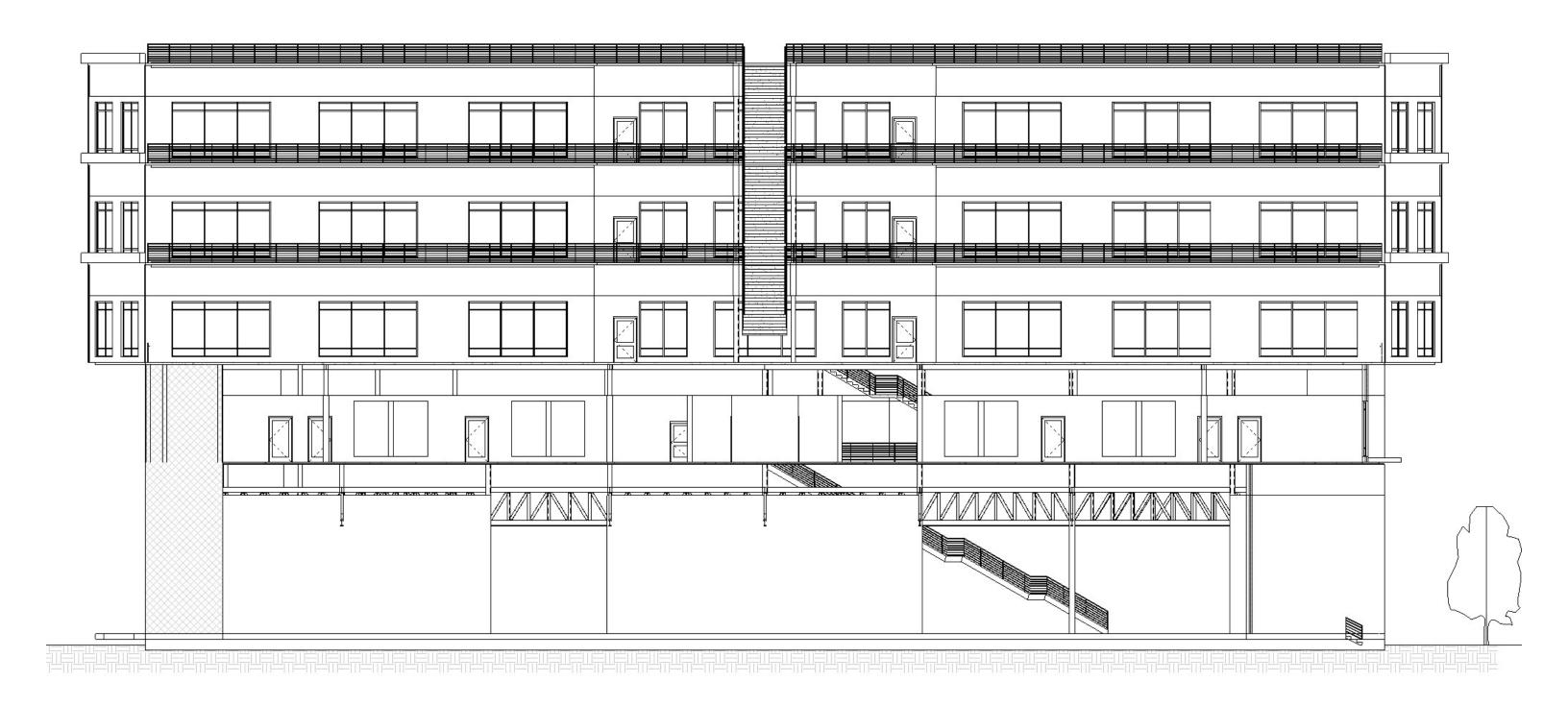
4, 5, 6 LEVEL FLOOR PLANS



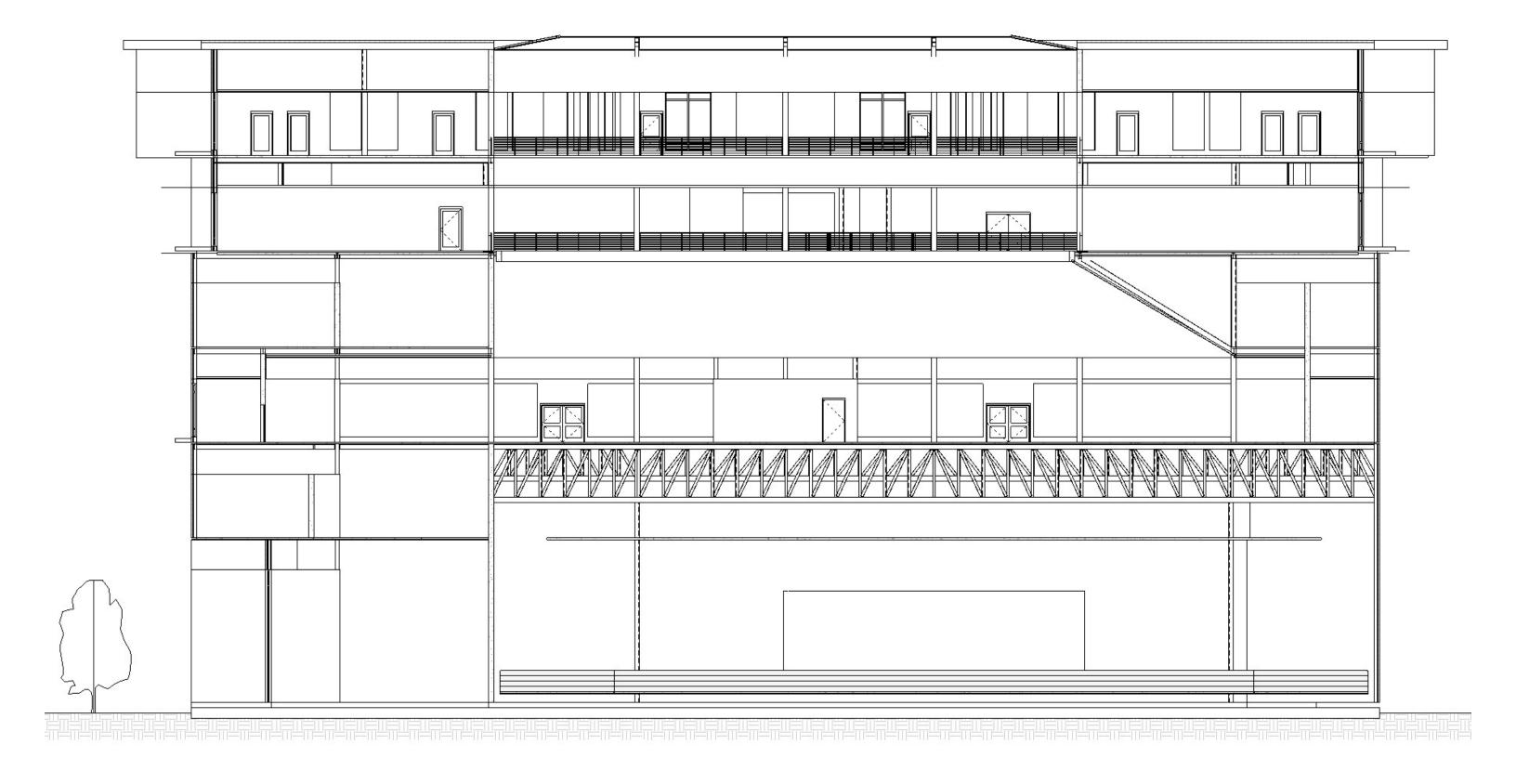
LONG SECTION A



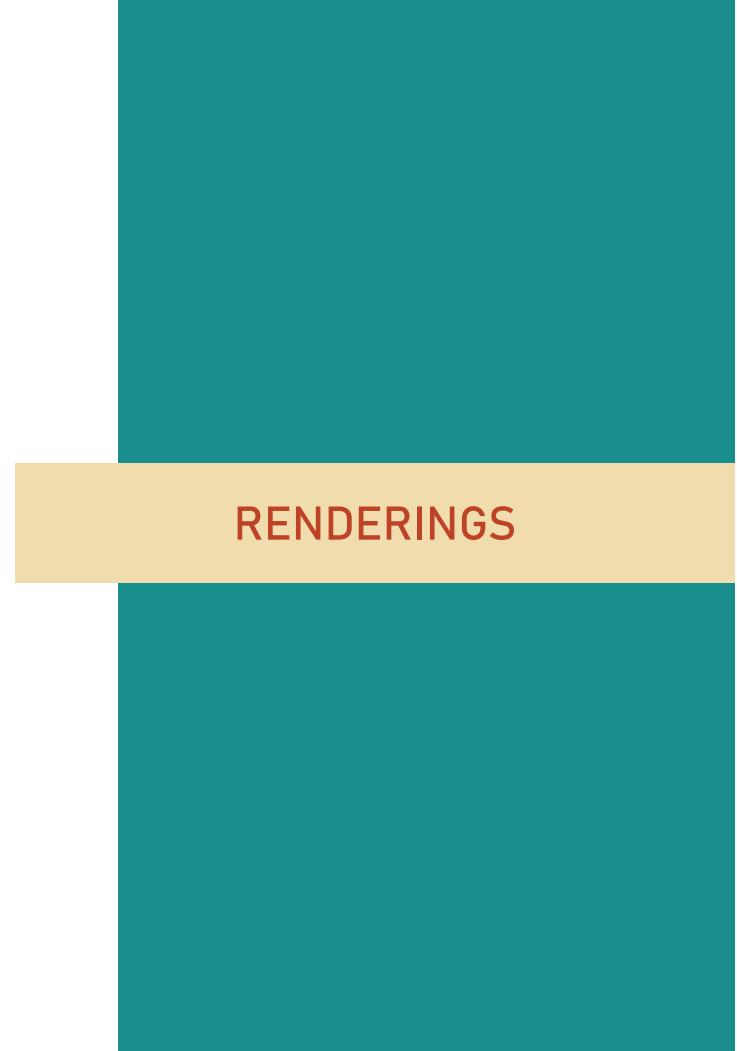
LONG SECTION B

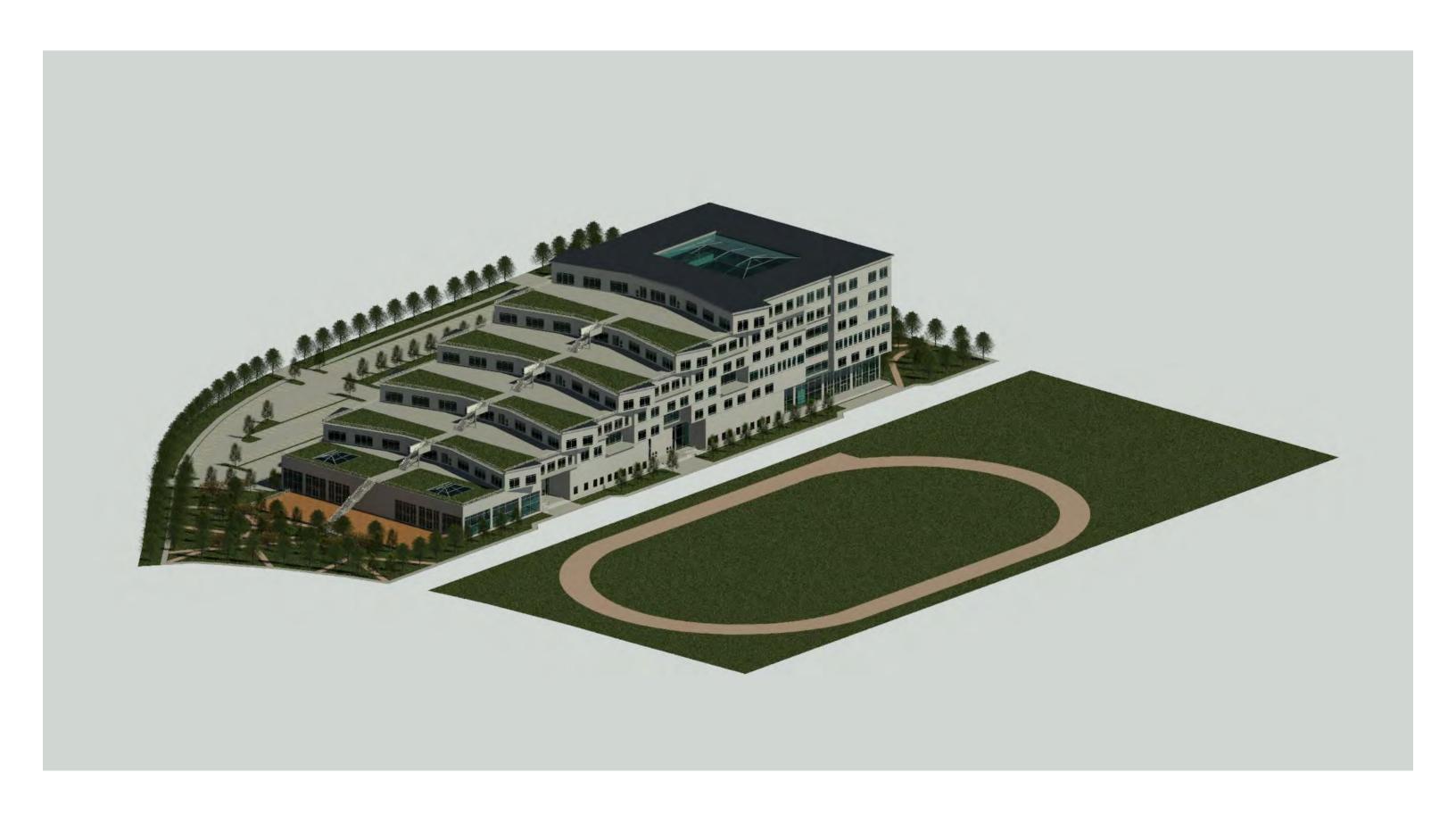


SHORT SECTION A



SHORT SECTION B











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To the student: Bring this form with you to your oral defense  To the Thesis Committee: Complete and return to the Office of Undergraduate Research and Major Awards in the Honors College, room 212W <u>OR</u> email to Dr. Rikki Bettinger at rrbettin@central.uh.edu.	
Student's Name: Savannah Tidwell	
Thesis Title: De Zavala Charter School	
Committee Decision (check one):  ☐ Pass ☐ New Defense Required	
Student will not complete the Senio	or Honors Thesis. Student will receive grades for the erving as independent study. No further action needed.
If the decision is <i>Pass</i> are substantive revisions recimprovements are not generally considered to be substantive	• •
If revisions are required, will it be necessary for the page is signed?	he committee to review them before the signature
Thesis Director:	
Name (please print)	Signature
Second Reader:	
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