



**ARROWHEAD  
ELEMENTARY  
SCHOOL FACILITIES  
STUDY (update)**

**August 20<sup>th</sup>, 2019**



## Tonight's Agenda:

- Update
- Review 3 Improvement Options
  - 1 FAS items + code required renovations
  - 2 FAS items + code required renovations + enlarged school capacity + gym
  - 3 New school building
- Additional district challenges (Worcester)



# PROCESS

An architectural/engineering analysis of the existing school and campus was conducted that evaluated the following:

- Overall functionality
- General condition
- Building systems
- Code compliance
- Energy efficiency
- Security protocols



# PROCESS

Design team met with district administrators and EVERY teacher from Arrowhead Elementary School to survey their thoughts on the existing building.

Toured three new elementary schools in area school districts:

- Caley Elementary School (Upper Merion Area School District)
- Phoenixville Early Learning Center (Phoenixville Area School District)
- East Coventry Elementary School (Owen J Roberts School District)





# PROCESS *(update)*

Met with school board July 16<sup>th</sup> to review study and answer additional questions.

Toured a recently renovated elementary school:

- Slatington Elementary School (Northern Lehigh School District)



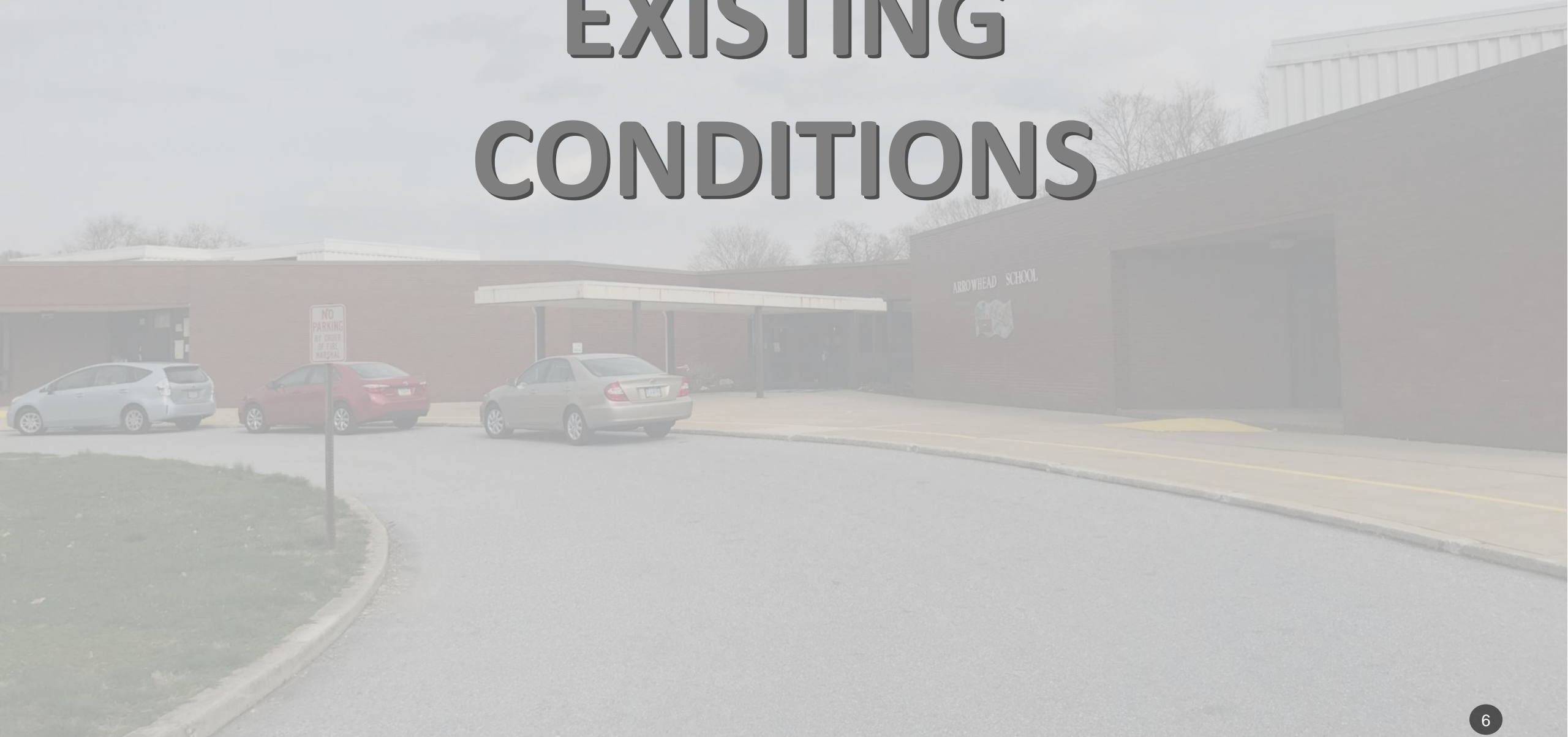
Before



After



# EXISTING CONDITIONS







## Summary:

1. Numerous exterior repairs to roofing, bricks, and flashing needed.
2. Numerous interior repairs to building are needed.
3. All building systems need replacement and upgrade.
4. Educational environments and security protocol improvements needed throughout.



CAPITAL IMPROVEMENTS	0-5 YEARS	5-10 YEARS	10+ YEARS
Investigate Source of Water Infiltration; Repair Rusted Steel	\$90,000		
Brick Veneer Mortar Joint Restoration; Replace EIFS	\$620,000		
Roof Replacement	\$1,000,000		
Exterior Window Replacement	\$200,000		
Exterior Entrances/Door Replacement	\$110,000		
Inspect Corridor Doors/Hardware; Safety Glass Required		\$150,000	
Carpet Replacement	\$65,000		
Replace Ceramic Tile Floors	\$90,000		
Repainting		\$135,000	
Replace Flooring (Terrazzo & VCT)		\$85,000	
Replace Acoustical Ceilings (Tiles & Grid)		\$315,000	
Replace Toilet Partitions		\$45,000	
Replace Plastic Laminate Casework		\$395,000	
Upgrade Kitchen (includes Flooring Replacement)	\$440,000		
Modernize Library	\$150,000		
Address Accessibility & Code Violations (req. with major renovation)	\$500,000		
Reconfigure Office to Provide Secure Building Entrance	\$100,000		
Paving Restoration & Sealcoating	\$150,000		
Replace Wood Mulch in Play Area with Rubber Surface		\$175,000	
Remove Modular Classrooms, Expand Building	\$1,860,000		
Improve Site Circulation		\$350,000	
Replace HVAC System (AHUs, Piping, Ductwork)	\$1,850,000		
Replace Boilers with High Efficiency Units (if expanding building)		\$170,000	
Repair Ducted Roof Penetration at Cooling Tower	\$15,000		
Replace Pneumatic Control System with Digital ATC System	\$247,500		
Repair/Replace Water Softening System	\$5,000		
Replace Plumbing Fixtures	\$385,000		
Replace Faulty Rainwater and Sewage Piping	\$175,000		
Add Fire Protection (Wet-Type Fire Suppression)	\$192,500		
Upgrade Main Electrical Service; Replace Substation	\$150,000		
Replace 1975 Panelboards & All Transformers	\$195,000		

summary continued on next page

CAPITAL IMPROVEMENTS continued	0-5 YEARS	5-10 YEARS	10+ YEARS
Replace 1975 Wiring		\$195,000	
Replace Emergency Generator		\$175,000	
Replace Interior Lighting with LED, Auto. Controls, Occ. Sensors	\$385,000		
Replace Exterior Lighting with LED (Poles, Wiring, Controls)	\$185,000		
Install Complete Theatrical Stage Lighting System	\$175,000		
Install Complete Theatrical Stage Sound System		\$90,000	
Replace Building Sound/Paging and Clock System		\$140,000	
Replace Fire Alarm System		\$195,000	
Replace Data Network Backbone, Add Cooling and UPS	\$80,000		
<b>TOTAL ARROWHEAD NEEDS:</b> (\$186/s.f.)	<b>\$12,030,000</b>	<b>\$9,415,000</b>	<b>\$2,615,000</b>
			<b>\$0</b>

**RECOMMENDATION**

Address all needs at Arrowhead with a single, comprehensive project within the next 5 years. The District should gain the benefit of economies of scale and save on costs depending upon inflationary impacts on construction costs. A single comprehensive project would be estimated to save 5-10% off of the sum of the ala carte costs above.

However, it is important to note that the ala carte costs above do not include reconfiguration of educational spaces or building additions apart from the consideration to replace the modular classrooms with permanent construction. One major caution in carrying out a comprehensive renovation is that open plan concept buildings of the 1970's do not easily lend themselves to reconfiguration to meet current educational programs and accommodate modern building systems. This means that the District should expect to pay a significant cost premium to move walls and modify structure if necessary to accommodate today's needs. Depending on the final educational design program and any hidden conditions encountered during construction, this renovation effort could potentially cost 10-20% more than replacement of the entire building with new construction.

For comparison purposes, new construction of the same size building would cost approximately \$16,200,000. This is about 35% more than the sum of the ala carte recommendations. Careful consideration of the future intended use of this facility should yield a sensible decision with respect to ala carte improvements, complete renovation, or new construction.

EXCERPT FROM FAS REPORT



CAPITAL IMPROVEMENTS <i>continued</i>	0-5 YEARS	5-10 YEARS	10+ YEARS
Replace 1975 Wiring		\$195,000	
Replace Emergency Generator		\$175,000	
Replace Interior Lighting with LED, Auto. Controls, Occ. Sensors	\$385,000		
Replace Exterior Lighting with LED (Poles, Wiring, Controls)	\$185,000		
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Replace Fire Alarm System		\$195,000	
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<b>TOTAL ARROWHEAD NEEDS:</b>	<b>(\$186/s.f.) \$12,030,000</b>	<b>\$9,415,000</b>	<b>\$2,615,000</b>
			<b>\$0</b>

Capacity of one (1) Half Day Kindergarten = 44

22 in the AM

22 in the PM

# EXCERPT FROM FAS REPORT



**Items needed for code and/or proper condition renovation:**

- 1. New roof**
- 2. New windows**
- 3. New interior partitions to create rectangular classrooms**
- 4. Doors into classrooms**
- 5. New technology in classrooms**
- 6. New secure entry vestibule**
- 7. New HVAC system**
- 8. ADA compliant plumbing fixtures**
- 9. New energy efficient lighting**
- 10. Building expansion to meet needs**
- 11. Include 2016 FAS items**





## Modern Building Code Requirements:

1. International Building Code 2015
  - Current Pennsylvania code
2. Will require sprinklers throughout the school
3. Will require indoor air quality upgrades and monitoring
4. Will require new lighting with daylighting controls
5. Additional roof insulation will be needed to meet modern energy codes



**HOW DO WE MAKE THE CHANGE?**



The background of the slide is a photograph of a school building with a brick facade and a paved parking lot with yellow curbs. The image is faded to serve as a backdrop for the text.

# **OPTION #1**

## **F.A.S. ITEMS + CODE**

### **COMPLIANT**

### **RENOVATIONS**



## OPT #1

### Concerns with existing layout:

- Classroom sizes too small
- Teachers struggle with room shape
- Lack of Small Group Instruction
- Lack of exterior access for windows
- Modulares past their anticipated life
- Administration area disconnected from secure entry vestibule
- Gym/Cafeteria combo too small
- Instrumental Music in storage room

EXISTING FLOOR PLAN (58,534sf school with modulares)





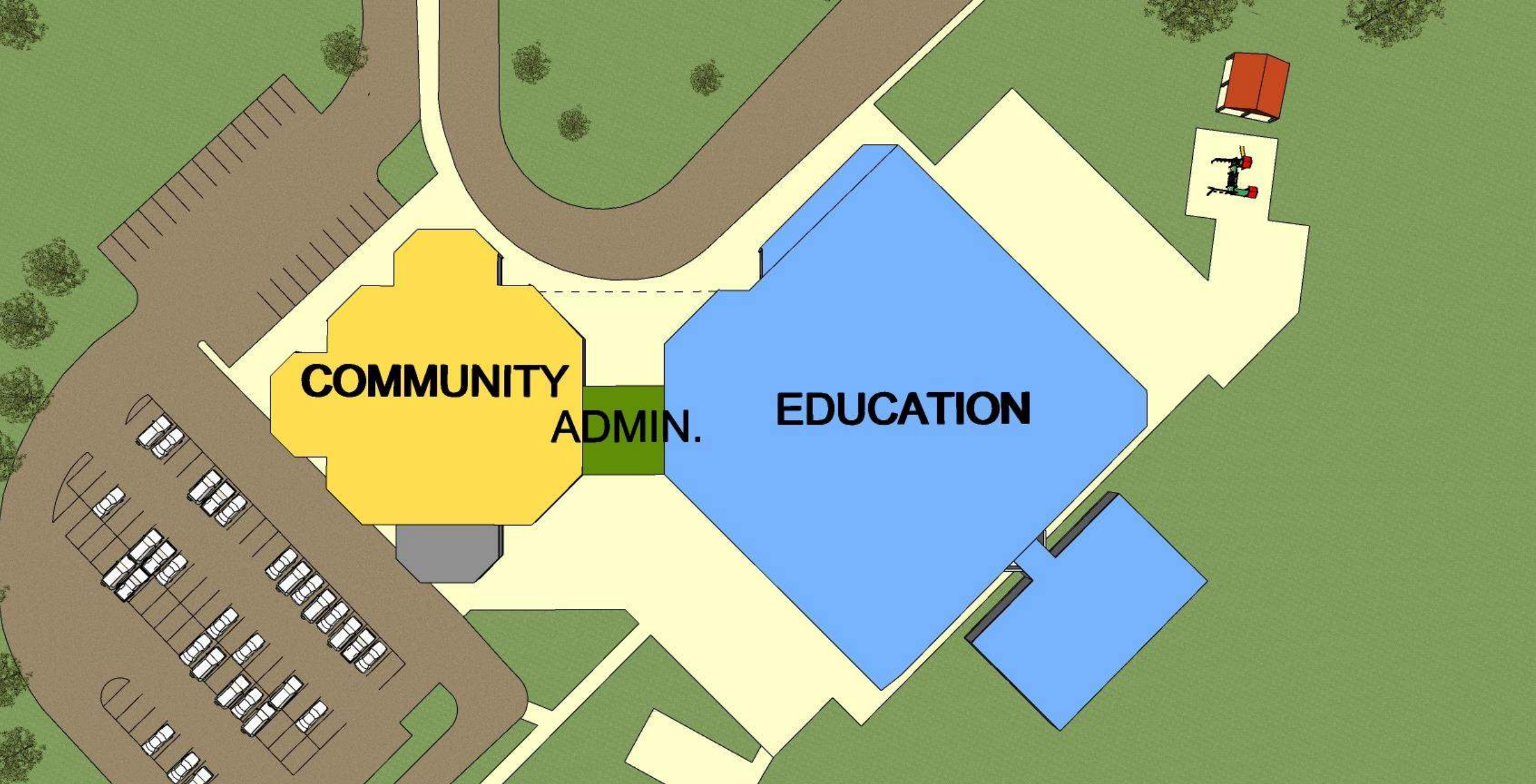
## OPT #1

### Concerns with existing layout:

- Meet current building code requirements
- Meet modern best practices for school security

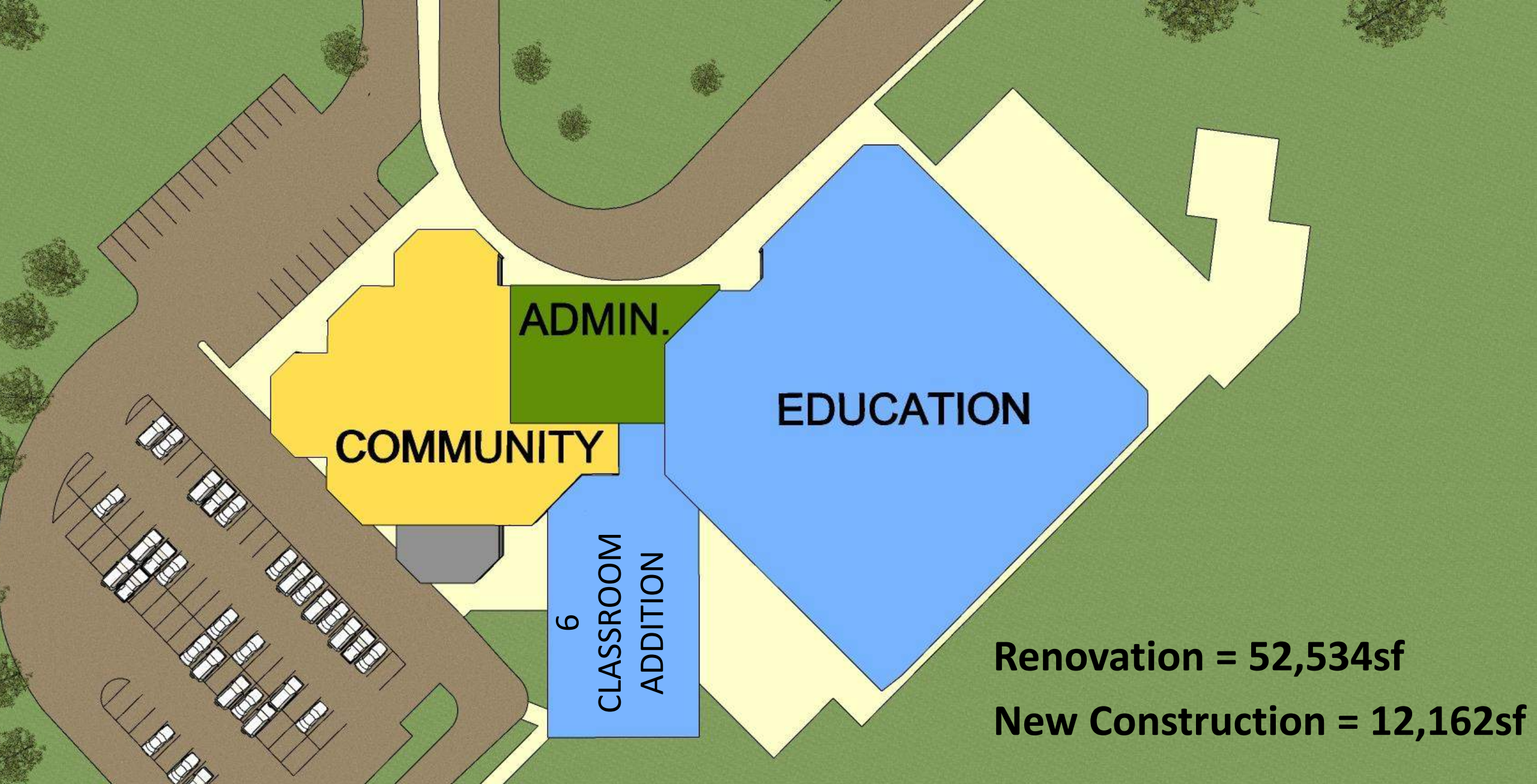
EXISTING FLOOR PLAN (58,534sf school with modulars)





**OPT #1 - EXISTING FLOOR PLAN (58,534sf School with modulares)**





**EXISTING FLOOR PLAN + NEW CLASSROOMS** (64,696sf School without modulares + 6 Classroom Addition)

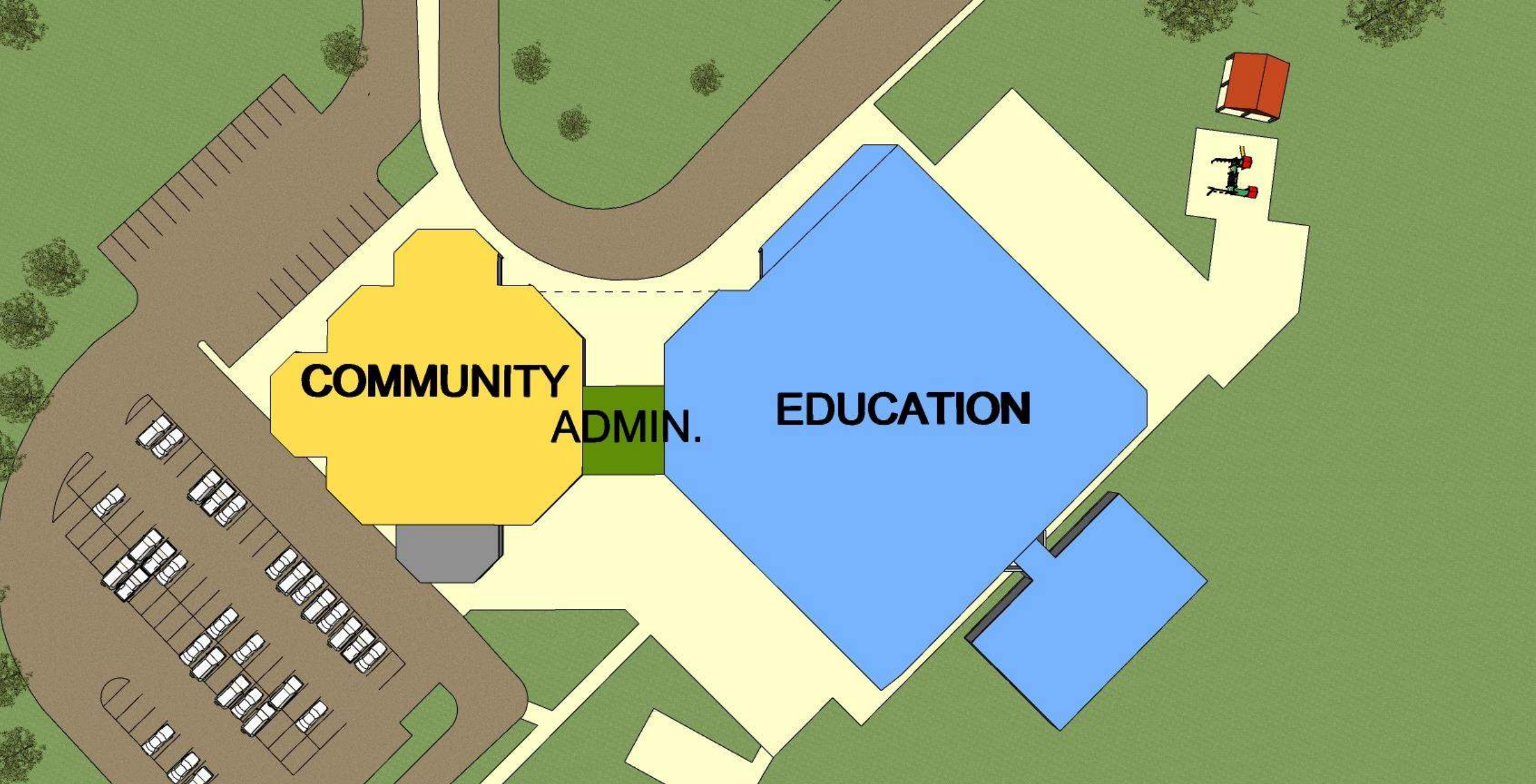
# OPT. #1 - F.A.S. ITEMS + CODE COMPLIANT RENOVATIONS

STUDENT CAPACITY = 500

Building Renovations of 52,534sf (\$151/sf)			\$7,922,498
Building Systems Budget (\$85/sf)			\$4,465,390
Proposed New Construction (12,162sf @ \$275/sf)			\$3,344,550
Site Work associated with New Construction			\$1,204,038
Design/Bidding Contingency - 5%			\$846,824
<b>TOTAL CONSTRUCTION COST</b>			<b>\$17,783,300</b>
Construction Contingency - 10%			\$1,778,330
Soft Costs - 15% (Fees, Permits, etc.)			\$2,667,495
Budget: FF&E Allowance (\$1200/student)			<u>\$630,000</u>
<b>TOTAL PROJECT COST</b>			<b>\$22,859,125</b>

**INCLUDES: ROOF REPLACEMENT, REPLACEMENT OF MOST BUILDING SYSTEMS + ADDITION OF SPRINKLER SYSTEM + NEW SECURE FRONT ENTRANCE & ADDITION OF SIX CLASSROOMS TO REPLACE MODULARS .**





**OPT #2 EXISTING FLOOR PLAN (58,534sf School with modulares)**

**OPTION #2**

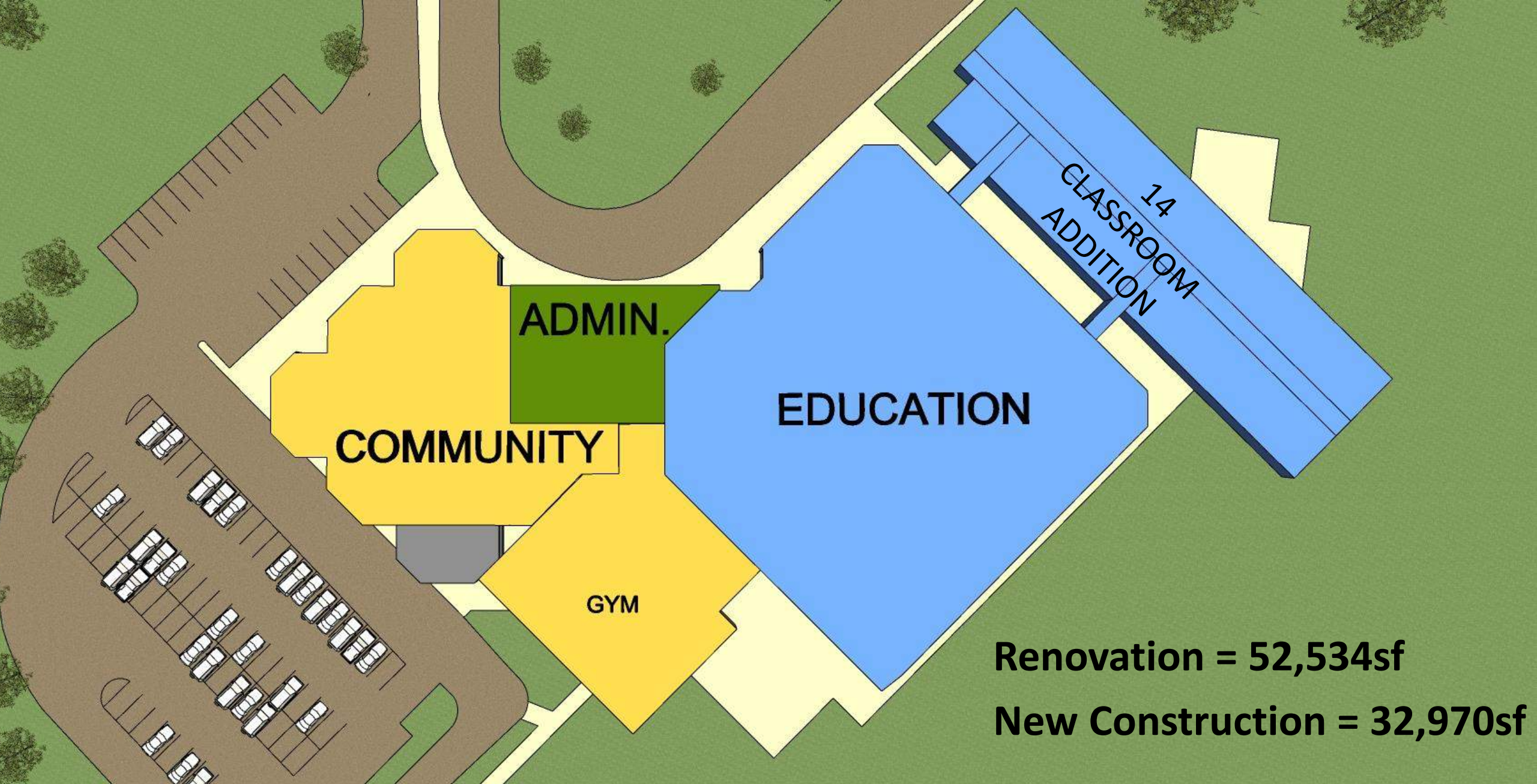
**F.A.S. ITEMS + CODE**

**RENOVATIONS +**

**ENLARGE CAPACITY +**

**GYM**





**Renovation = 52,534sf**

**New Construction = 32,970sf**

**OPT #2 FLOOR PLAN – 625 Students (85,504sf School)**

# OPT. #2 - F.A.S. ITEMS + CODE RENOVATIONS + ENLARGE CAPACITY + GYM

STUDENT CAPACITY = 625

Building Renovations of 52,534sf (\$151/sf)			\$7,922,498
Building Systems Budget (\$85/sf)			\$4,465,390
Proposed New Construction (32,970sf @ \$275/sf)			\$9,066,750
Site Work associated with New Construction			\$3,264,030
Design/Bidding Contingency - 5%			\$1,235,933
<b>TOTAL CONSTRUCTION COST</b>			<b>\$25,954,601</b>
Construction Contingency - 10%			\$2,595,460
Soft Costs - 15% (Fees, Permits, etc.)			\$3,893,190
Budget: FF&E Allowance (\$1200/student)			<u>\$750,000</u>
<b>TOTAL PROJECT COST</b>			<b>\$33,193,252</b>

**INCLUDES: ROOF REPLACEMENT, REPLACEMENT OF MOST BUILDING SYSTEMS + ADDITION OF SPRINKLER SYSTEM + NEW SECURE FRONT ENTRANCE & ADDITIONAL CLASSROOMS TO MEET EDUCATIONAL PROGRAM AND NEW GYMNASIUM.**





## What's missing in renovation options:

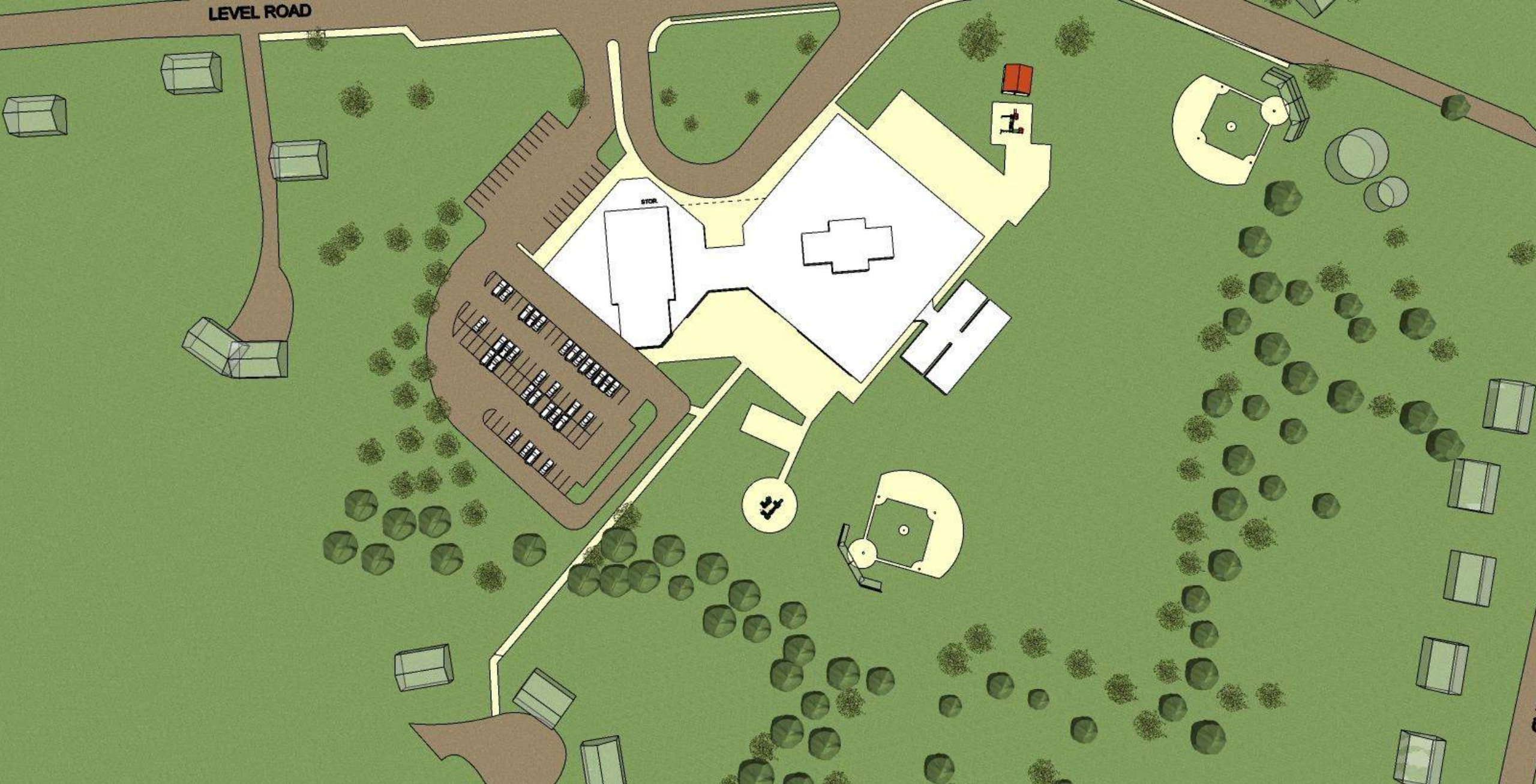
1. Exterior building insulation and moisture protection not improved to meet today's capabilities
2. Building layout is not ideal
3. Renovated classroom dimensions long and skinny
4. Additional classroom wing remote from building core
5. Does not address vehicle circulation safety concerns or other campus challenges
6. \$18m or \$26m for renovations that are constrained due to existing conditions and structure



The background image shows a school building with a brick wall on the right and a parking lot with yellow curved lines in the foreground. The scene is slightly hazy or foggy.

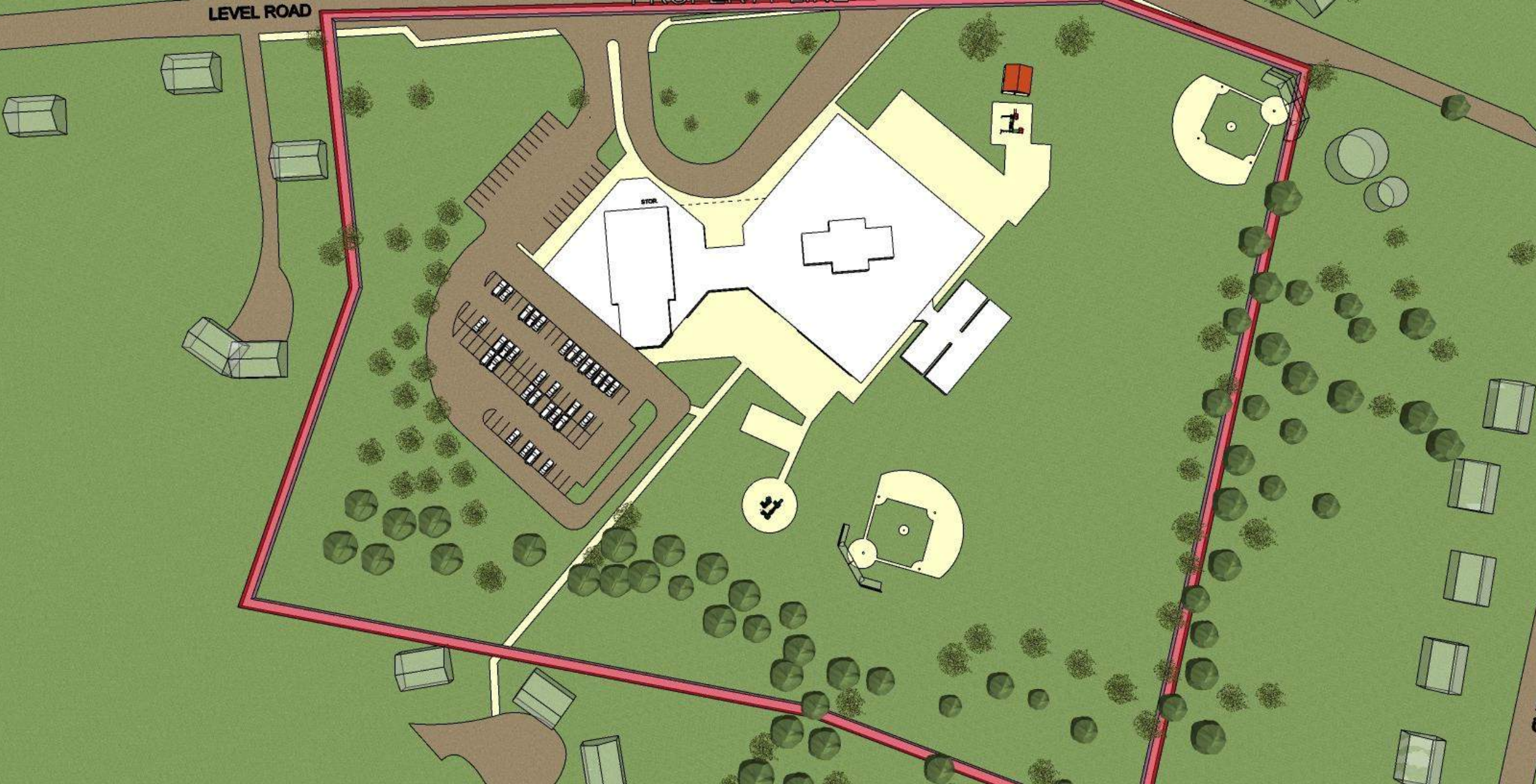
# **OPT#3 NEW BUILDING CONSTRUCTION**





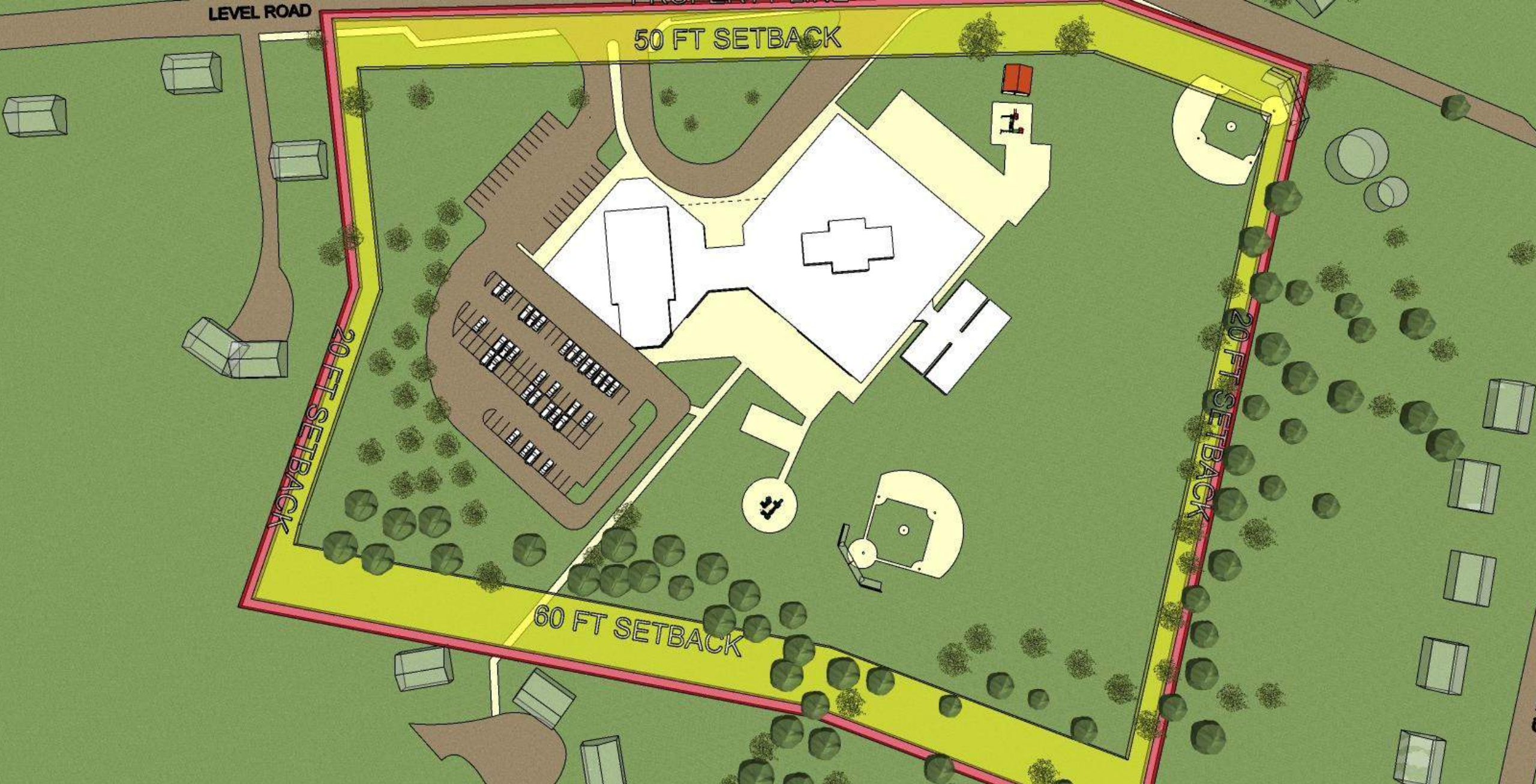
OPT #3 EXISTING SITE





OPT #3 PROPERTY LINE





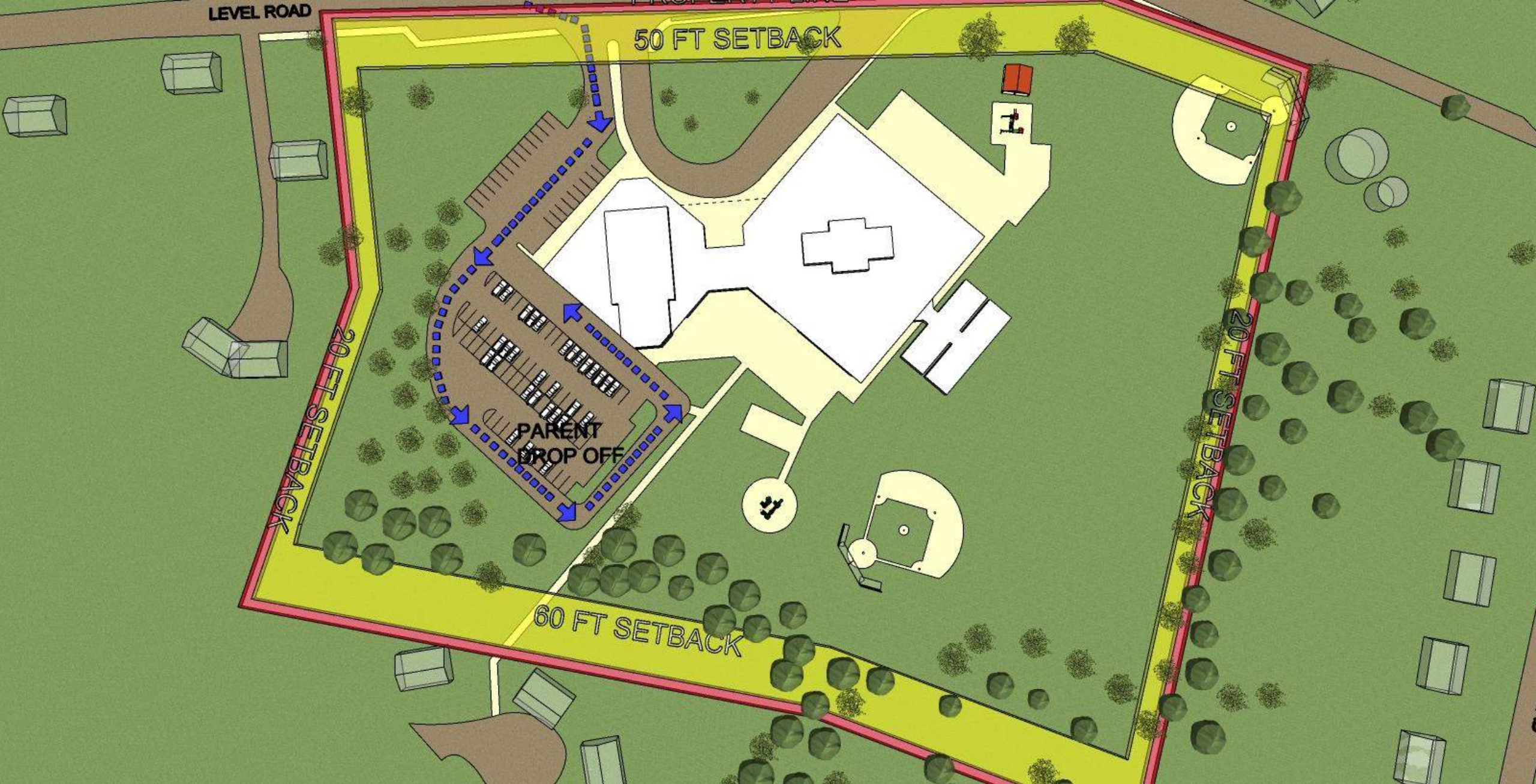
OPT #3 SITE SETBACKS





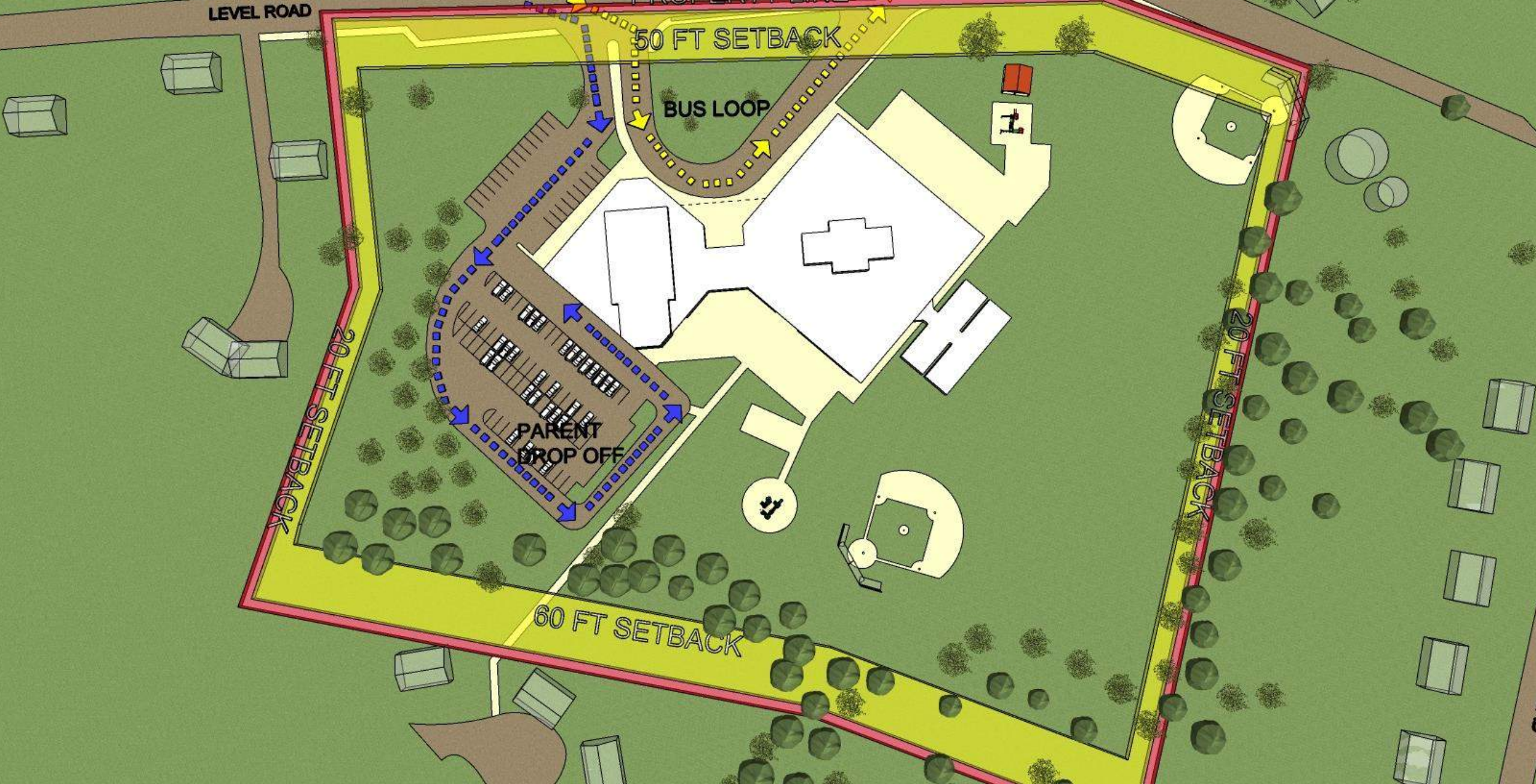
OPT #3 EXISTING SLOPES





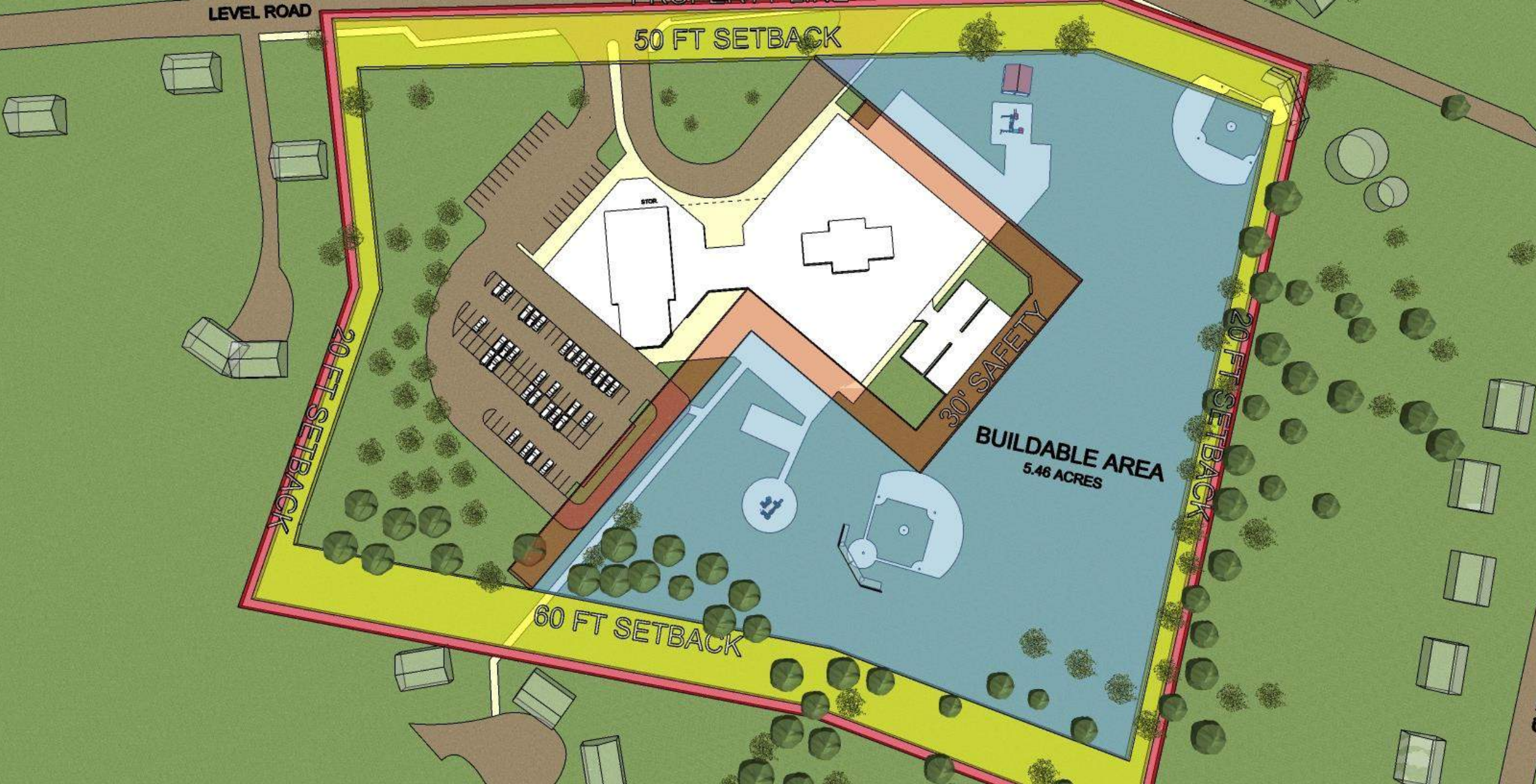
OPT #3 PARENT DROP OFF





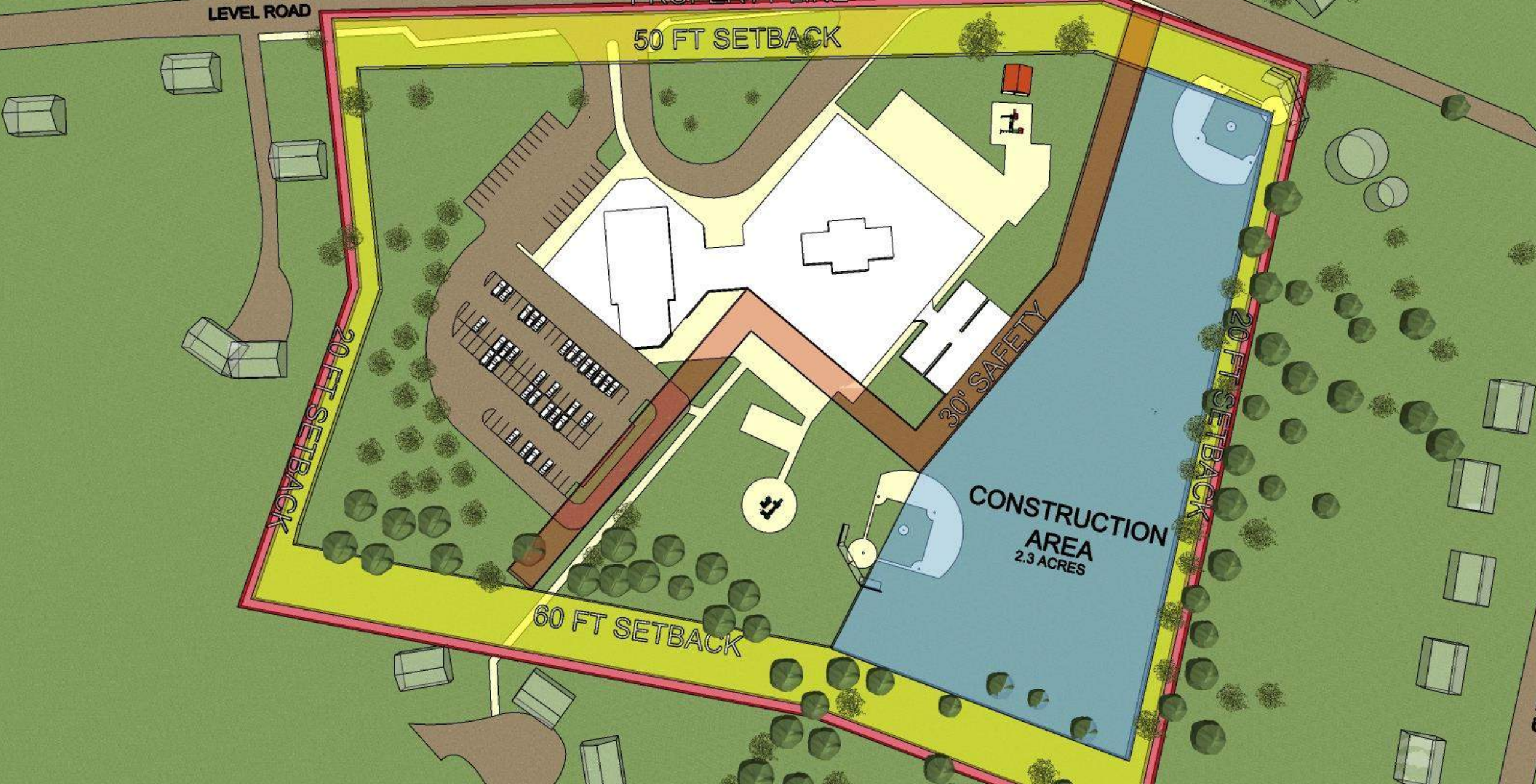
OPT #3 BUS DROP OFF





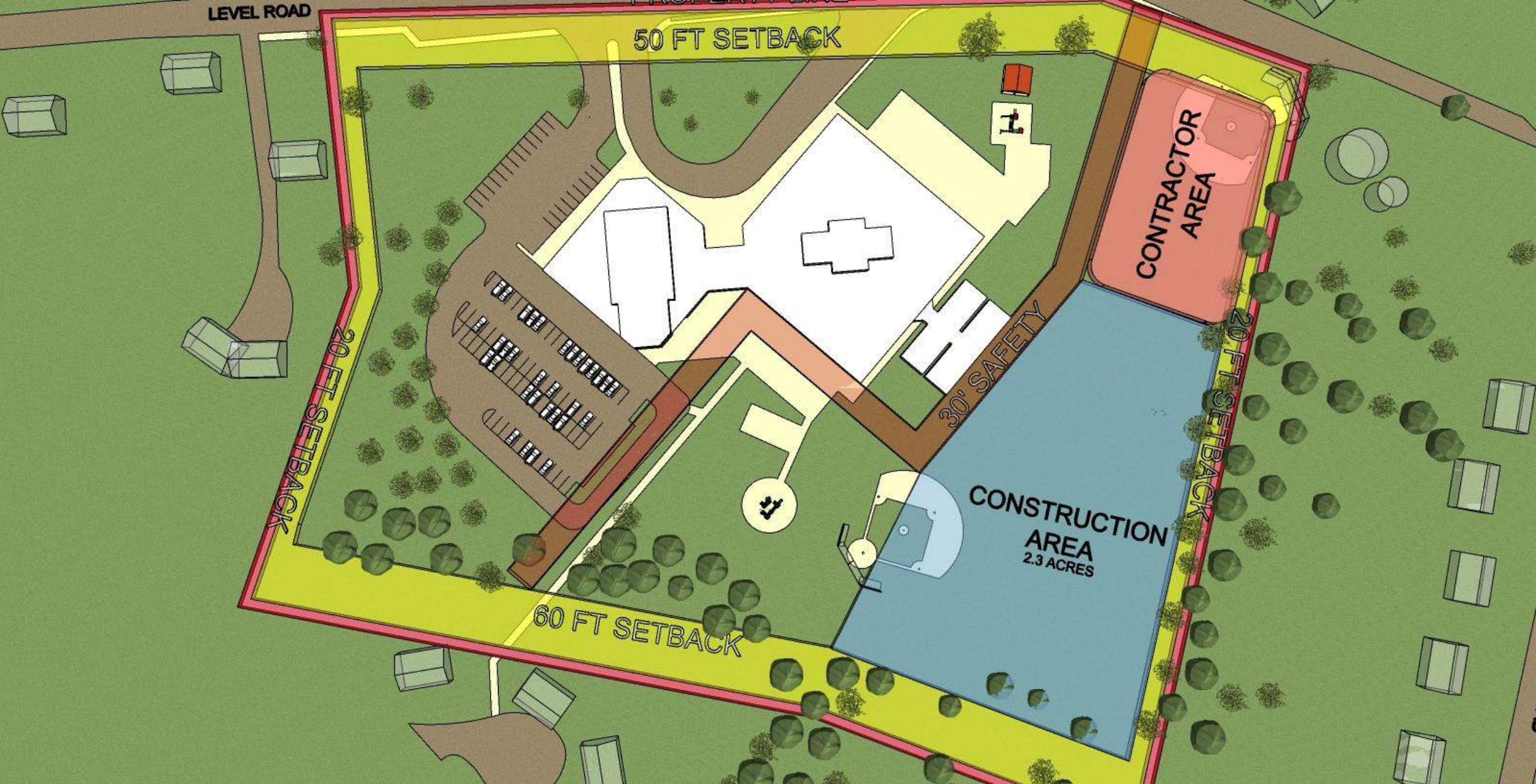
OPT #3 BUILDABLE AREA





OPT #3 CONSTRUCTION AREA





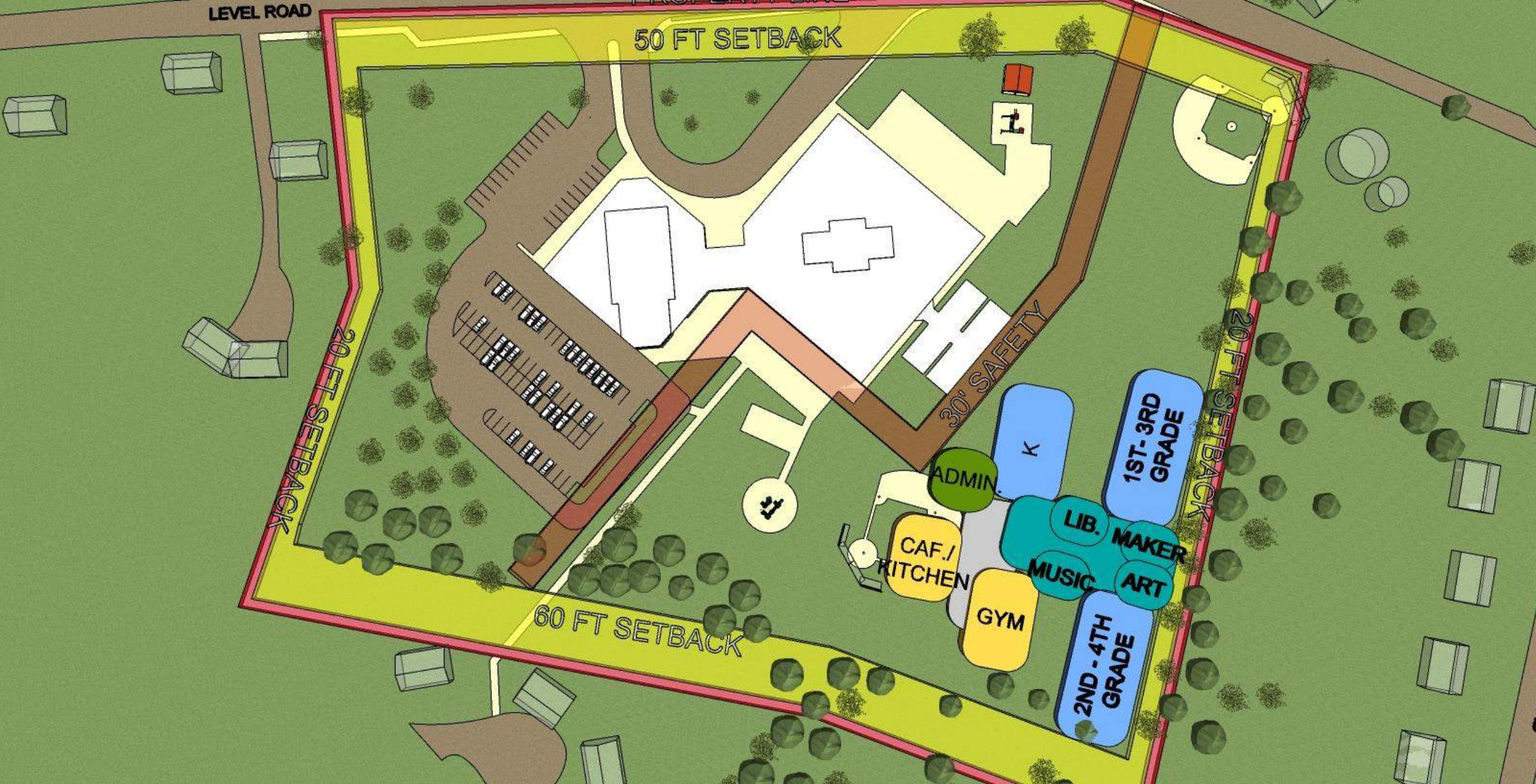
OPT #3 CONSTRUCTION AREA + CONTRACTOR AREA





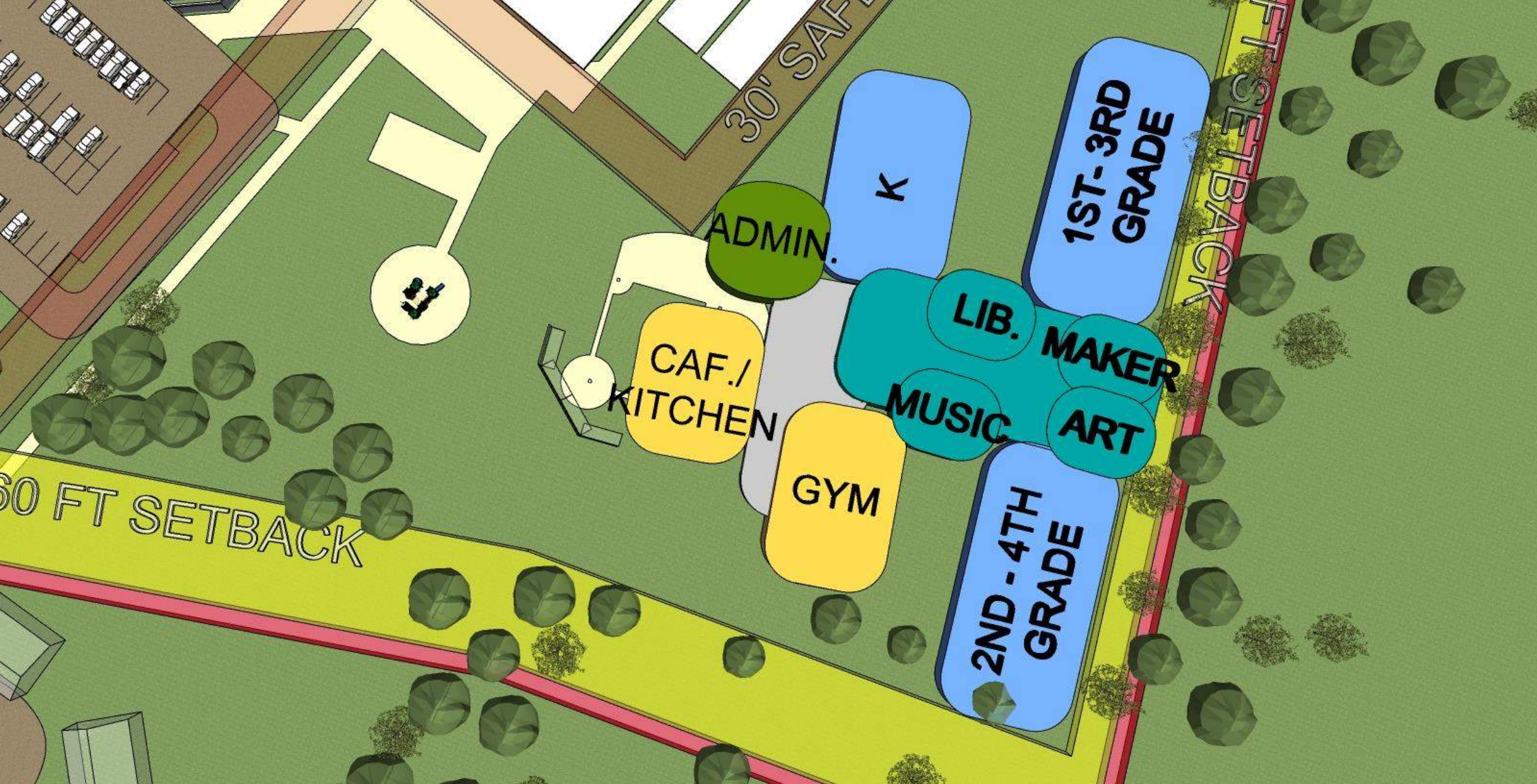
OPT #3 CONCEPTUAL NEW SCHOOL DIAGRAM





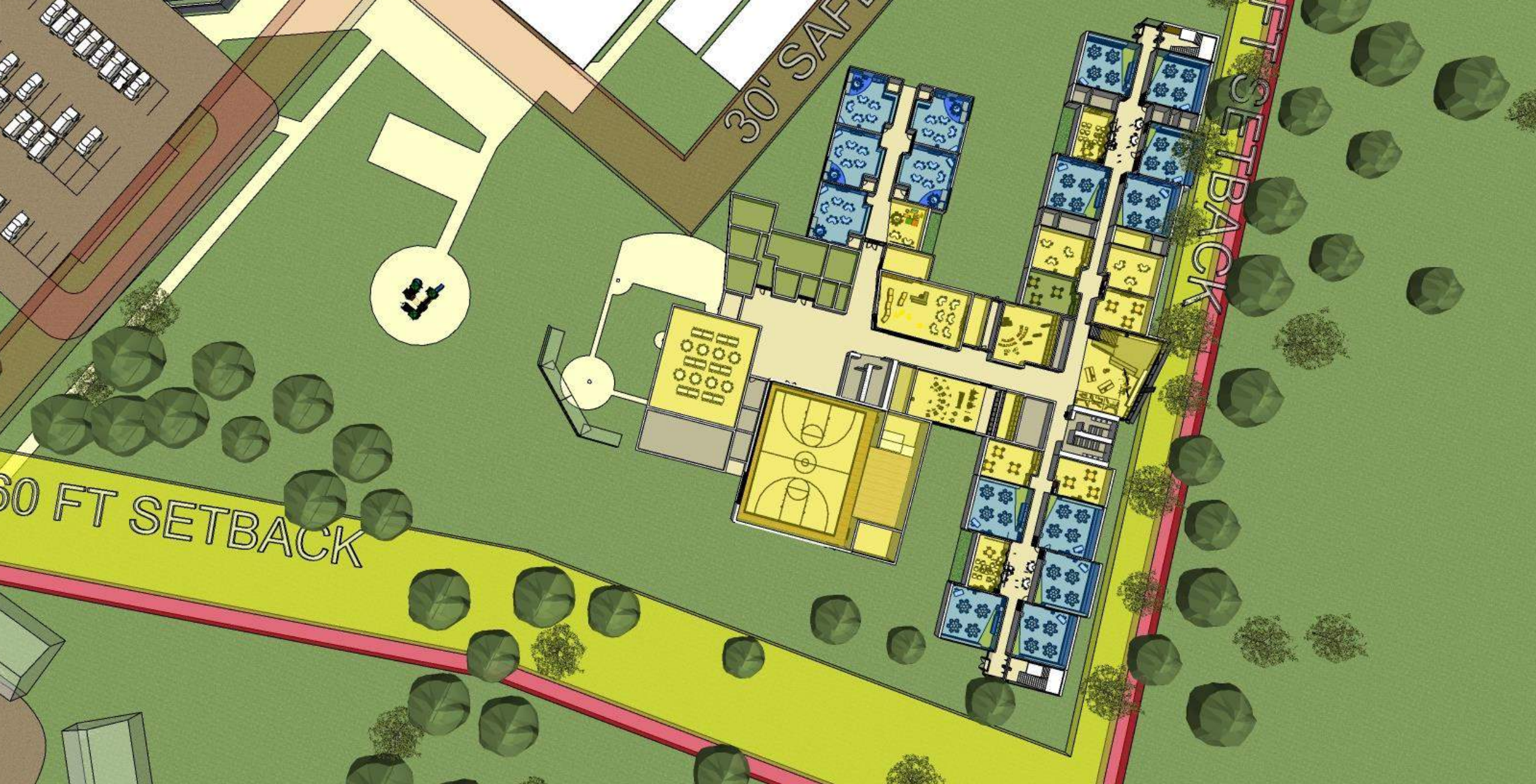
OPT #3 CONCEPTUAL NEW SCHOOL DIAGRAM





OPT #3 CONCEPTUAL NEW SCHOOL DIAGRAM





OPT #3 CONCEPTUAL NEW SCHOOL DIAGRAM





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 1<sup>ST</sup> FLOOR PLAN









OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – K WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 1<sup>st</sup> GRADE WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 1<sup>st</sup> GRADE WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 1<sup>st</sup> GRADE WING





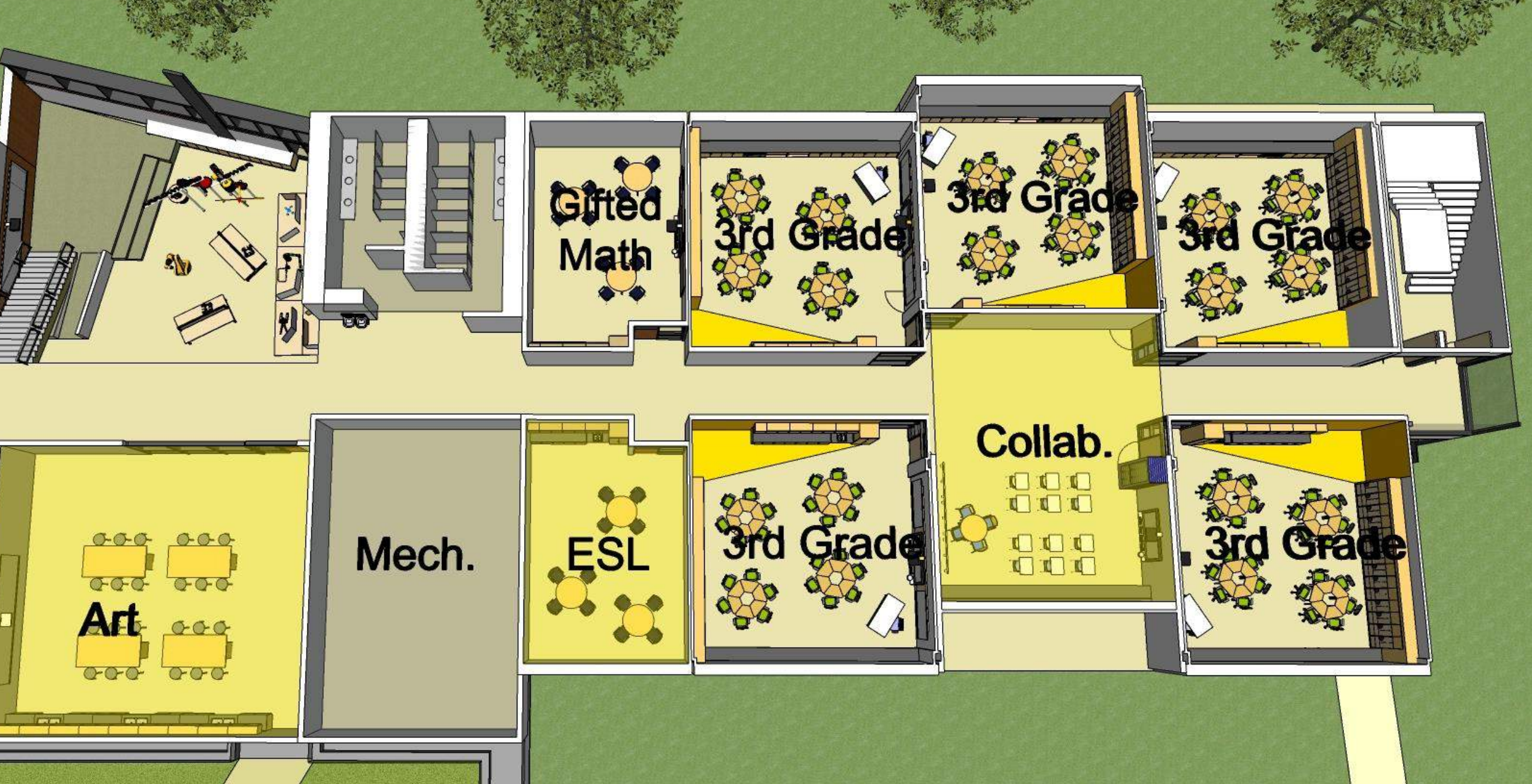
OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 2<sup>nd</sup> GRADE WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 2<sup>ND</sup> FLOOR PLAN





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 3rd GRADE WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 4th GRADE WING





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 4th GRADE WING - SGI





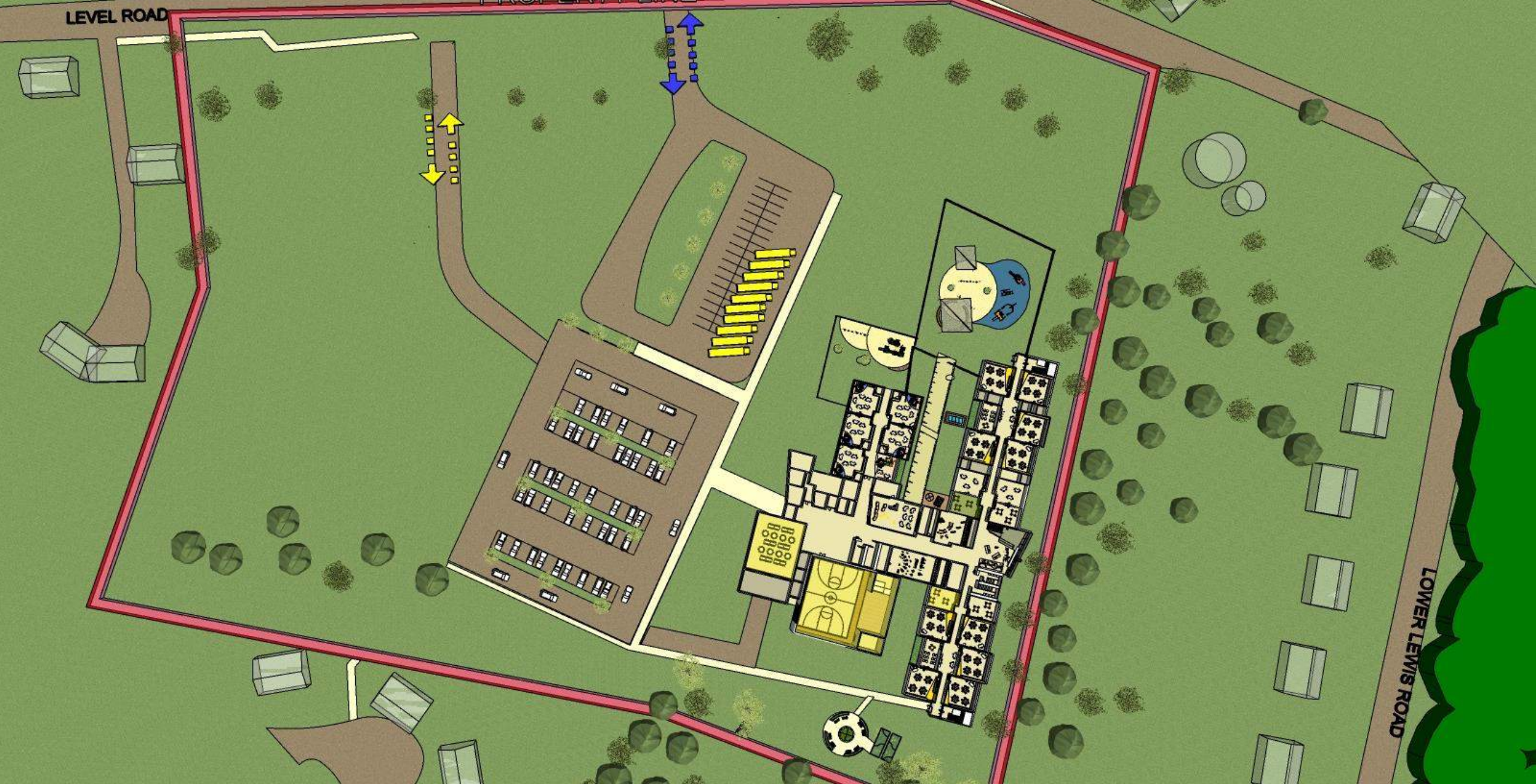
OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 4th GRADE WING – SGI





OPT #3 CONCEPTUAL NEW SCHOOL LAYOUT – 4th GRADE WING - SGI





OPT #3 CONCEPTUAL NEW SITE LAYOUT



# NEW SCHOOL OPTION – CAPACITY 625

Proposed New Construction (84,000sf* @ \$270/sf)			\$22,680,000
Site work required for new construction (18%)			\$4,082,400
Demo of existing school building (52,534sf @ \$8/sf)			\$420,272
Design/Bidding Contingency - 3%			\$815,480
<b>TOTAL CONSTRUCTION COST</b>			<b>\$27,998,152</b>
Construction Contingency - 5%			\$1,399,908
Soft Costs - 15% (Fees, Permits, etc.)			\$4,199,723
Budget: FF&E Allowance (\$1200/student)			<u>\$750,000</u>
<b>TOTAL PROJECT COST</b>			<b>\$34,347,783</b>

\*REFLECTS CURRENT DESIGN WHICH HAS CHANGED SINCE JUNE 4, 2019

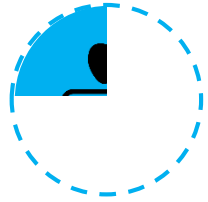


# OPTIONS COMPARED

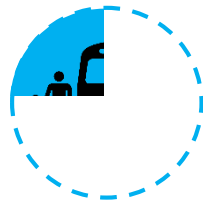
	<u>Option 1</u>	<u>Option 2</u>	<u>Option 3</u>
<b>Building Renovation Costs</b>	<b>\$7,922,498</b>	<b>\$7,922,498</b>	<b>\$0</b>
<b>Build Systems Costs</b>	<b>\$4,465,390</b>	<b>\$4,465,390</b>	<b>\$0</b>
<b>New Constriction Costs</b>	<b>\$4,548,588</b>	<b>\$12,330,780</b>	<b>\$27,182,672</b>
<b>Design/Bid Contingency</b>	<b>\$846,824</b>	<b>\$1,235,933</b>	<b>\$815,480</b>
<b>TOTAL CONSTRUCTION COST</b>	<b>\$17,783,300</b>	<b>\$25,954,601</b>	<b>\$27,998,152</b>
<b>Construction Contingency</b>	<b>\$1,778,330</b>	<b>\$2,595,460</b>	<b>\$1,399,908</b>
<b>Soft Costs</b>	<b>\$2,667,495</b>	<b>\$3,893,190</b>	<b>\$4,199,723</b>
<b>FF&amp;E Allowance</b>	<b>\$630,000</b>	<b>\$750,000</b>	<b>\$750,000</b>
<b>TOTAL PROJECT COST</b>	<b>\$22,859,125</b>	<b>\$33,193,252</b>	<b>\$34,347,783</b>
	500 STUDENT RENO	625 STUDENT RENO	625 STUDENT NEW



## Option #1 (Reno + Add) = \$17.8M



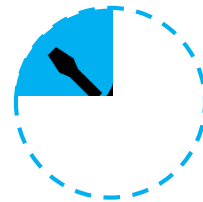
education



bus



parent loop



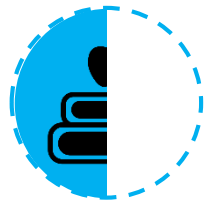
disruption



schedule

← 28 months

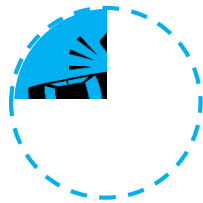
## Option #2 (Reno + Larger Add) = \$26M



education



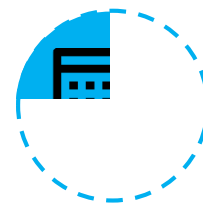
bus



parent loop



disruption



schedule

← 33 months

## Option #3 (New School Construction) = \$28M



education



bus



parent loop



disruption



schedule

← 21 months













- **Consider moving forward with new school to open August 2022**
- **Begin Schematic Design Phase (September – October)**
- **Begin Land Development coordinate with local Township**
- **November Board Mtg. Update**



# Potential Schedule for Collaborative Design Process

## ARROWHEAD ELEMENTARY SCHOOL METHACTON SCHOOL DISTRICT

ACTION	2019				2020								
	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	
SCHEMATIC DESIGN PHASE	← weekly meetings →												
Site and building concepts Conceptual educational layouts Safety/security design review Building systems cost/performance analysis Sustainability workshops Schedule and budget analysis First community workshop/town hall meeting													
DESIGN DEVELOPMENT PHASE			← bi-weekly meetings →										
Detailed site and building layout Faculty and teacher end user meetings Coordinate with district administrative departments Interior fit-out classrooms/common spaces Safety/security design review Building systems selection Sustainability workshops Schedule and budget analysis Hold Act 34 hearing Second and third town hall meetings													
CONSTRUCTION DOCUMENTS PHASE							← bi-weekly meetings →						
Value engineering Constructability reviews BIM project documentation Review alternates and develop bidding strategy Safety/security design review Sustainability workshops Schedule and budget analysis Fourth and fifth town hall meetings													



**A/E TEAM**  
KCBA Architects  
Snyder Hoffman Associates  
Gilmore & Associates



**CONSTRUCTION CONSULTANTS**  
Fidevia Construction Management  
and Consulting  
District Solicitor



**DESIGN COMMITTEE**  
School Board  
Dr. David Zerbe, Superintendent  
Dr. Aaron Roberts, Arrowhead E.S. Principal  
Mr. Tim Bricker, Director of Business Services  
Mr. Mark Fretz, Director of Facilities  
Other individuals identified by district



**END USERS**  
Dr. Aaron Roberts, Arrowhead E.S. Principal  
Arrowhead E.S. Faculty and Teachers  
District Administrative Departments:  
Food Service, Transportation, IT,  
Security, Maintenance  
Arrowhead E.S. Students



**COMMUNITY**  
Arrowhead E.S.  
Community

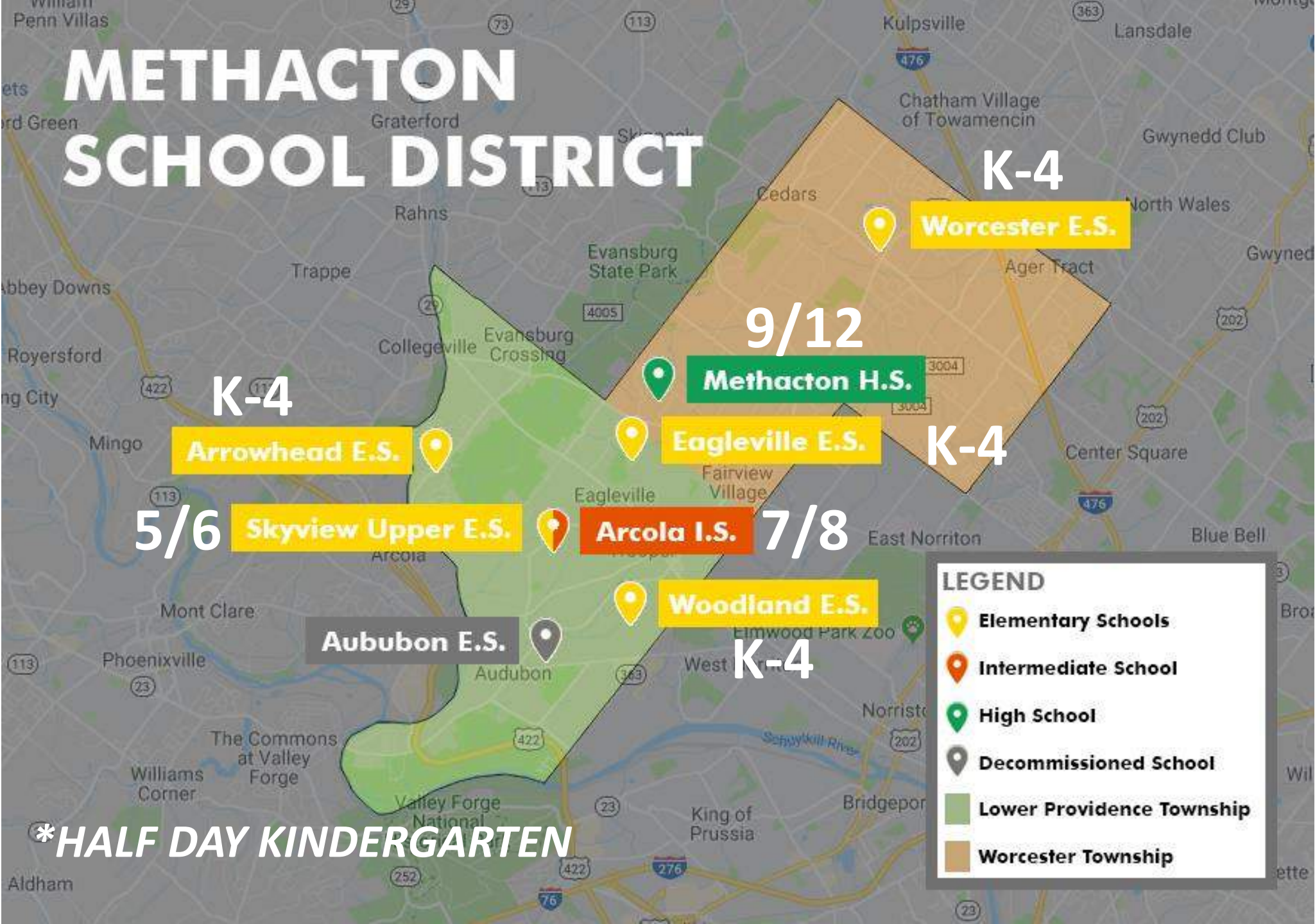


A photograph of Worcester Elementary School, a two-story brick building with large windows and columns. An American flag flies on a tall pole to the left. The sky is blue with white clouds. The school's name is visible on a banner above the entrance.

# Worcester Elementary School



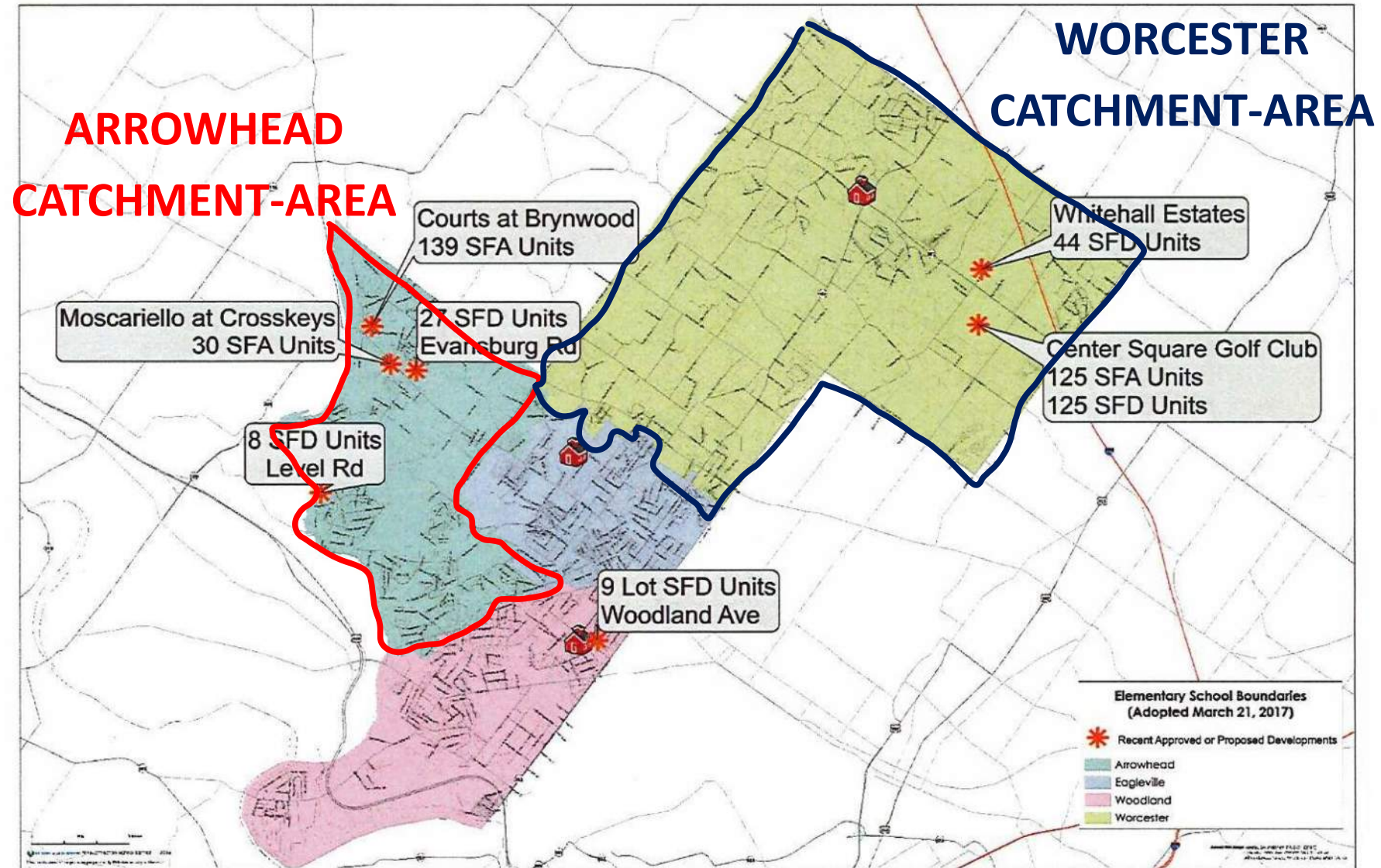
# METHACTON SCHOOL DISTRICT



**\*HALF DAY KINDERGARTEN**



# MSD Pipeline Residential Projects (2016 & 2017)





# Option A

## Current School and Grade Configuration

School	Functional Capacity	Oct 1 2018 SY 18/19		Oct 1 2022 SY 22/23		Oct 1 2027 SY 27/28	
		Enrollment	Utilization	Enrollment	Utilization	Enrollment	Utilization
Skyview	876	746	85.16%	738	84.25%	691	78.88%
Arcola	1290	743	57.60%	766	59.38%	732	56.74%
HS	2086	1578	75.65%	1522	72.96%	1471	70.52%
Arrowhead	468	404	86.42%	434	92.74%	473	101.07%
Eagleville	468	394	84.21%	377	80.56%	416	88.89%
Worcester	448	416	92.81%	490	109.38%	540	120.54%
Woodland	488	460	94.18%	435	89.14%	450	92.21%
TOTALS	6124	4741	77.42%	4762	77.76%	4773	77.94%

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Highly Concerning - Exceeds recommended utilization buffer of 90%

Caution - Approaching utilization buffer (85% -89.9%)

COSTS PROJECTION: Requires new construction or renovations





Worcester Elementary

Shurt Mill

W Skippack Pike

73

S Valley Forge Rd

Exxon



# FOUR CLASSROOM ADDITION TO WORCESTER ELEMENTARY

Building Renovations of 2,000sf (\$170/sf)			\$240,000
Building Systems Budget (\$85/sf)			\$170,000
Proposed New Construction (5,000sf @ \$300/sf)			\$1,500,000
Site Work associated with New Construction			\$540,000
Design/Bidding Contingency - 5%			\$127,500
<b>TOTAL CONSTRUCTION COST</b>			<b>\$2,677,500</b>
Construction Contingency - 12%			\$321,300
Soft Costs - 20% (Fees, Permits, etc.)			\$535,500
Budget: FF&E Allowance (\$1200/student)			<u>\$120,000</u>
<b>TOTAL PROJECT COST</b>			<b>\$3,654,300</b>

INCLUDES: FOUR ADDITIONAL CLASSROOMS TO THE CURRENT SCHOOL CAPACITY.  
RENOVATION AND SECURITY IMPROVEMENTS TO THE ADMINISTRATION AND FRONT ENTRY  
OF THE SCHOOL.



# DISCUSSION