# Scope Study Report

# Joppatowne High School

## *Harford County Public Schools*

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Bel Air, Maryland 21014


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**November 30, 2009**

# Joppatowne High School – Scope Study Report
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# 1

# Proposed Scope Study Summary

# PROPOSED SCOPE STUDY SUMMARY

The initial task for the study is to increase the state rated student capacity of the school by 255 students from 1,126 to 1,381. The student increase generally denotes a twelve-classroom addition. The Committee's input designated the configuration of the spaces as noted below.

The Homeland Security Program is intended to become a Magnet Program and be designated as the Homeland Security Academy. The Homeland Security spaces should be arranged to provide a cohesive identity to the program.

The Family & Consumer Sciences spaces are to provide a Professional Foods Lab and support spaces, which do not currently exist in the facility. If possible, this should be located in proximity to other F&CS spaces.

The Child Development Lab and Instructional spaces should be configured to current standards, which include a lab, classroom and observation space. Externally, there should be a secured children's play area. Ideally direct exterior access for parents to drop-off and pick-up the children directly without entering the school facility. The existing Child Development area can be given back to the Music Program as practice space.

The Arts Graphics Lab is to support the existing arts spaces and does not currently exist at the facility. The Darkroom will replace the existing makeshift dark room and will be fully functioning to meet current standards.

The Emergency Operations Center is a unique space that serves instructional needs for the Homeland Security Program and will also serve as a training area to County Agencies. The Emergency Operations Center should be positioned for after-hours access and use without entering the remainder of the school.

A space summary table is included on the following page.

**JOPPATOWNE HIGH SCHOOL** – Proposed Classroom Addition

| Room/Space | Number Each | size (ea.) | Total | Subtotals |
|---|---|---|---|---|
| **Homeland Security** | | | | |
| Lab (Chemistry) | 2 | 1,200 | 2,400 | |
| Prep/Storage | 1 | 300 | 300 | |
| Law Enforcement (Courtroom) | 1 | 1,800 | 1,800 | |
| Computer Lab | 2 | 1,000 | 2,000 | |
| Classroom | 3 | 750 | 2,250 | |
| Storage | 1 | 300 | 300 | |
| Planning | 1 | 550 | 550 | 9,600 |
| | | | | |
| **Family & Consumer Science** | | | | |
| Professional Foods Lab | 1 | 1,600 | 1,600 | |
| Child Care Lab/Classrooms | 1 | 2,300 | 2,300 | |
| Laundry/Storage | 1 | 200 | 200 | |
| Office | 1 | 100 | 100 | 4,200 |
| | | | | |
| **Art** | | | | |
| Graphic Design | 1 | 900 | 900 | |
| Dark Room | 1 | 350 | 350 | 1,250 |
| | | | | |
| **NET** | | | | 15,050 |
| | | | | |
| Emergency Operation Center | 1 | 1,600 | 1,600 | 1,600 |
| | | | | **16,650** |

The full Committee met on five occasions between November 2008 and July 2009. A separate meeting occurred with HCPS Planning & Construction Staff, Harford County Code Officials the State Fire Marshal with Harford County jurisdiction and the Architect to review the overall proposed concept and building code implications.

The Design Team reviewed the existing facility with a focus to identify substandard conditions, infrastructure components to allow a building addition and recommendations for facility improvements. Civil, Structural, Mechanical, Electrical & Plumbing Engineering reports are attached in the Appendix. Architectural considerations are embodied in the text of Existing Conditions Summary.

The Committee and specifically the Joppatowne High School faculty and staff provided valuable insight for spatial, instructional, site and facility issues to be considered with any improvements

plan. The facility is well maintained and faculty and staff have been creative in adapting updated curriculum to existing spaces.

## INITIAL ADDITION/PARTIAL RENOVATION CONCEPTS

The Design Team compiled the Committee's input with their own observations and proceeded to approach the Feasibility Scope Study in stages of increasing breadth and complexity. Concept A establishes the classroom addition with minimal improvement that will be required to support it. Concepts B and C provide variations of a classroom addition and provide staged levels of improvements to the existing facility. These options support the addition, extend the life and useful operation of the facility and improve the educational/instructional capacity of the existing facility.

Separately, the Design Team identified several "Recommended Systemic Improvements" that are beneficial in extending the life of the facility and improving its operation. These should provide the Harford County Board of Education some flexibility to establish a reasonable budget for a proposed Addition/Modernization as well as a schedule for future improvements.

## COMPREHENSIVE ADDITION/MODERNIZATION CONCEPT D

Further direction was provided to the Design Team after the development of the previous Addition/Renovation Concepts. The Design Team was directed more deeply review the conditions at the existing facility for a Comprehensive Addition Modernization Concept. Its purpose was to bring the existing facility into closer compliance with more recently constructed high school projects in Harford County and include key instructional areas that are lacking in comparison to other facilities. The rated capacity is anticipated to increase to approximately 1,400 students with this concept. This concept is further presented in Item 5 "Preferred Concept D – Comprehensive Addition/Modernization."

The Design Team was also directed to explore a full facility replacement as had been accomplished with Bel Air and Edgewood High Schools. These attempts did not prove to be feasible. They are further presented in Item 3 "Site Option Summary."

# 2

# Existing Conditions Summary

# EXISTING CONDITIONS SUMMARY

## EXISTING SITE CONDITIONS

The Joppatowne High School is situated on sixty-five acres near Route 40 in Joppa, Maryland. The site is currently accessible from Joppa Farm Road at Hinton Road and Falconer Road.

Much of the site is developed with parking and bus access from Hinton Road. The football stadium is to the north of the building toward the back of the site. The competition baseball field is on an elevated portion of the site to the east. Practice fields surround the facility on the north and west sides. Much of the site is sloped rolling grade generally high at the north and descending toward the south. The undeveloped portions of the site are heavily wooded. Directly around the building is level and buildable.

A storm water management facility (water quality and quantity) was installed at the southeast portion of the site with the recent completion of the Auxiliary Gymnasium Addition. The capacity of the facility was sized to account for a future classroom addition of approximately 20,000 square feet footprint.

The subgrade soil in the area of the existing facility is largely made up of medium-dense silt/sand/expansive clay. Much unsuitable soil was encountered during the recent construction that had to be replaced. Wet and unsuitable soil was also encountered below the lower level of the building which excavating for the locker room improvements. The existing terra-cotta perimeter storm and foundation drain system was found to be in poor condition. Some sections were collapsed, slope to drain was not consistent and much of the system was occluded. This condition may contribute to the poor and wet soil conditions.

There has been significant soil settlement surrounding the Auditorium and Stage areas. The sidewalks have settled as much as four inches in these areas. Slab areas interior to the facility have also settled in the stage and dressing room areas. The condition is primarily cosmetic and is not a structural concern as the foundation footings are sound. This is further discussed in the Structural Engineer's Report attached in the Appendix. Some additional minor settling has been noted in the Kitchen/Dining room wall.

## EXISTING BUILDING FACILITY

The original construction of the Joppatowne High School was completed in 1973. There has been little modification to the original composition of approximately 175,000 square feet. The building is organized in a large "H" shape with the auditorium, physical educational facilities, and cafeteria making up one vertical leg of the "H." The other vertical leg is a two-story classroom facility. The link between is the Administration and Student Services areas. Science Area Labs and Classrooms were renovated in 1996 on the second floor of the southern classroom wing. The Auxiliary Gym Addition was completed in the Fall of 2008 adjacent to the existing Gymnasium in a portion of an open-ended courtyard area created by the "H." Improvements

were also made to the Lower Level Locker Rooms as a part of the construction scope. The current facility configuration comprises 184,070 gross square feet.

The original shop/technology wing west of the Main Gymnasium and the Music wing west of the auditorium are 3'-4" lower than the main level of the building and only accessible via steps internally. Students with mobility impairments must traverse to outside sidewalks to access these areas. The shop/technology wing is heated and ventilated only; not air conditioned as the rest of the facility.

Technology upgrades have been introduced to the building. The MDF Room (entry point) for the data system is in the Media Center. Sub IDF racks have been installed in previous storage and planning spaces around the facility as required.

"Smart-Boards" have been installed in many classrooms during the past school year.

**INSTRUCTIONAL ISSUES - EXISTING BUILDING FACILITY**

The current stated rated capacity of Joppatowne High School is 1,126 students. Recent enrollment was 952 students. In the 2009/2010 school year 160 students were designated in Special Education programs. There were 10 CSP students.

Unique to the Joppatowne High School in Harford County is the Homeland Security Program. This is currently qualified as a Career and Technology Education completer program. This flagship curriculum has been used as a model to other surrounding jurisdictions and other states as well. The program currently serves approximately 180 students with 60 at each grade level 10-12.

High school curriculum delivery has of course changed since the original completion of the building and the staff of the Joppatowne High School has made various adaptations over the years. Following are some of the space usage concerns.

- The Homeland Security Program is spread around the facility into available spaces. The desire is to have the program cohesively located and to present its own physical identity.
- Special Education spaces are also disjointed. Special Education Planning has been retrofit into a portion of a previous tech lab at the west end of the school. The majority of the Special Education instructional spaces are on the east end.
- The CSP room has been fashioned by reducing a portion of the original Family & Consumer Sciences Home Foods Lab. It does not have an in-suite toilet or "quiet room."
- Family & Consumer Sciences and Arts spaces are also disjointed. The Childhood Development Classroom occupies a space between Instrumental and Vocal Music spaces on the west side of the Auditorium. It is not configured to current standards with classroom/observation spaces adjacent to the lab. It also does not accommodate an outdoor children's play area.
- There is no Professional Food Service Lab space available for the Family & Consumer Sciences curriculum area.
- Music instructional areas lack storage and practice areas.

- There is not identifiable Freshman Instruction Area. The faculty and staff do not see this as a major issue to the current curriculum delivery.
- Teacher planning areas are limited. The large Commons areas in the north instructional wing are under-used and may provide opportunity for planning and/or seminar area.
- The Main Office/Administration core is marginally workable. There is no visibility or supervision of the main entrance or bus drop off. There is no space for detained students. The Health Suite does not meet current IAC Guidelines. The lead secretary needs an enclosed office for bookkeeping with proximity to the Principal's office.
- There are 1,112 student lockers spaced throughout the school. The configurations of many of them do not accommodate book bags and such.
- The Cafeteria currently operates four lunch periods. There are three serving lines within the Kitchen area and a fourth in the dining area. Access to Dishwashing and tray drop-off is not adequate.
- Lighting throughout the facility needs improvement. Skylights in the Cafeteria and Media Center are problematic.

**ACCESSIBILITY ISSUES - EXISTING BUILDING FACILITY**

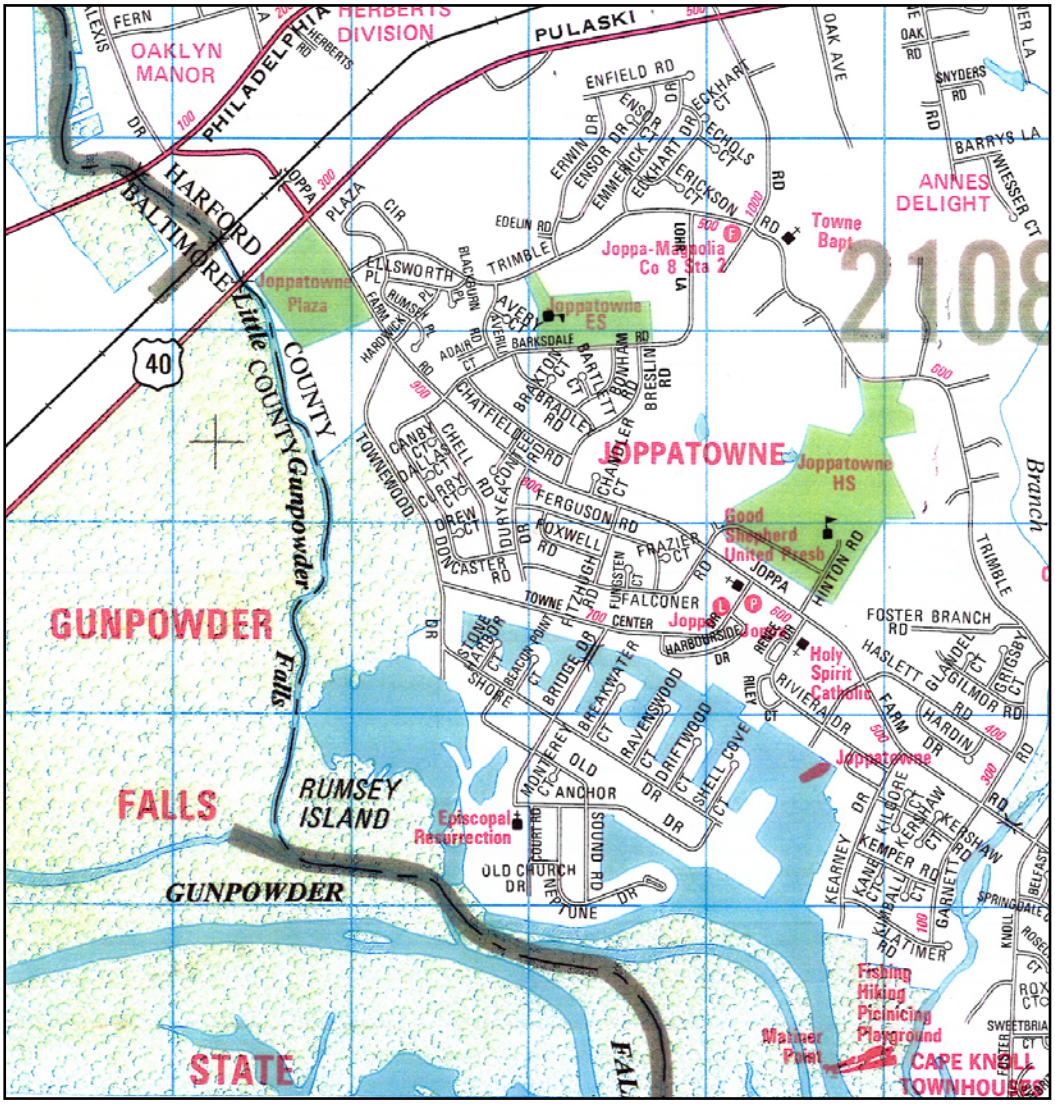
Some improvements have been made to specific toilet areas to improve accessibility. Recent construction with the Auxiliary Gymnasium Addition and Improvements provided elevator access to the Lower Level. ADA compliant toilets and shower areas were incorporated as well as improvements to doors and hardware. There is existing elevator access to the upper levels of the Classroom Wings at the east end of the facility.

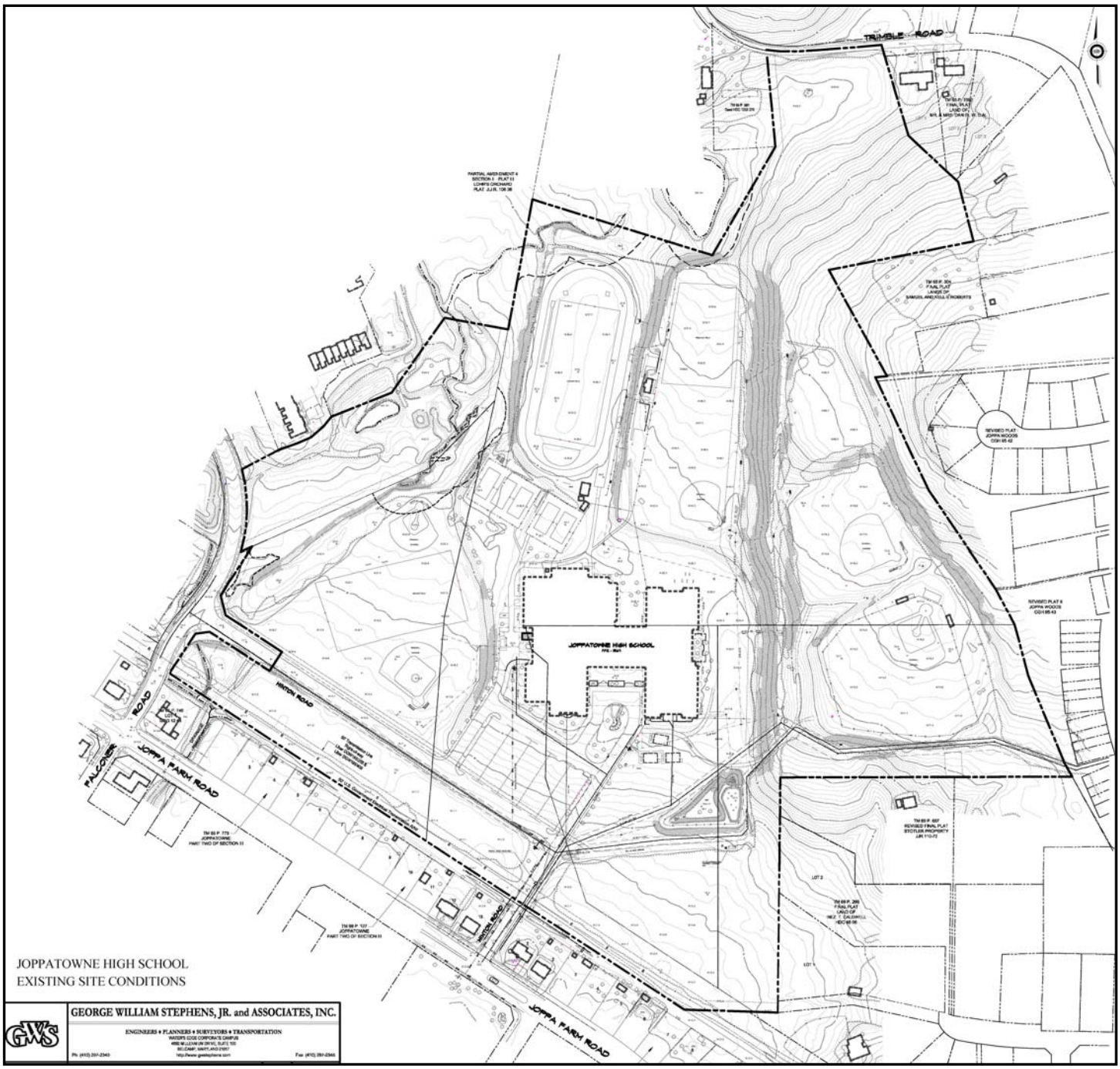
The original shop/technology wing west of the Main Gymnasium and the Music wing west of the auditorium are 3'-4" lower than the main level of the building and only accessible via steps internally.

Much of the existing door hardware does not meet current ADA standards. Many paired doorways are 5'-4" in width with door leaves of 2'-8" each. Door leaves should be 3'-0" in width to meet ADA doorway clearances.

As much as twenty percent (20%) of building construction budgets excluding site work must be dedicated to accessibility improvements until the facility is fully accessible.

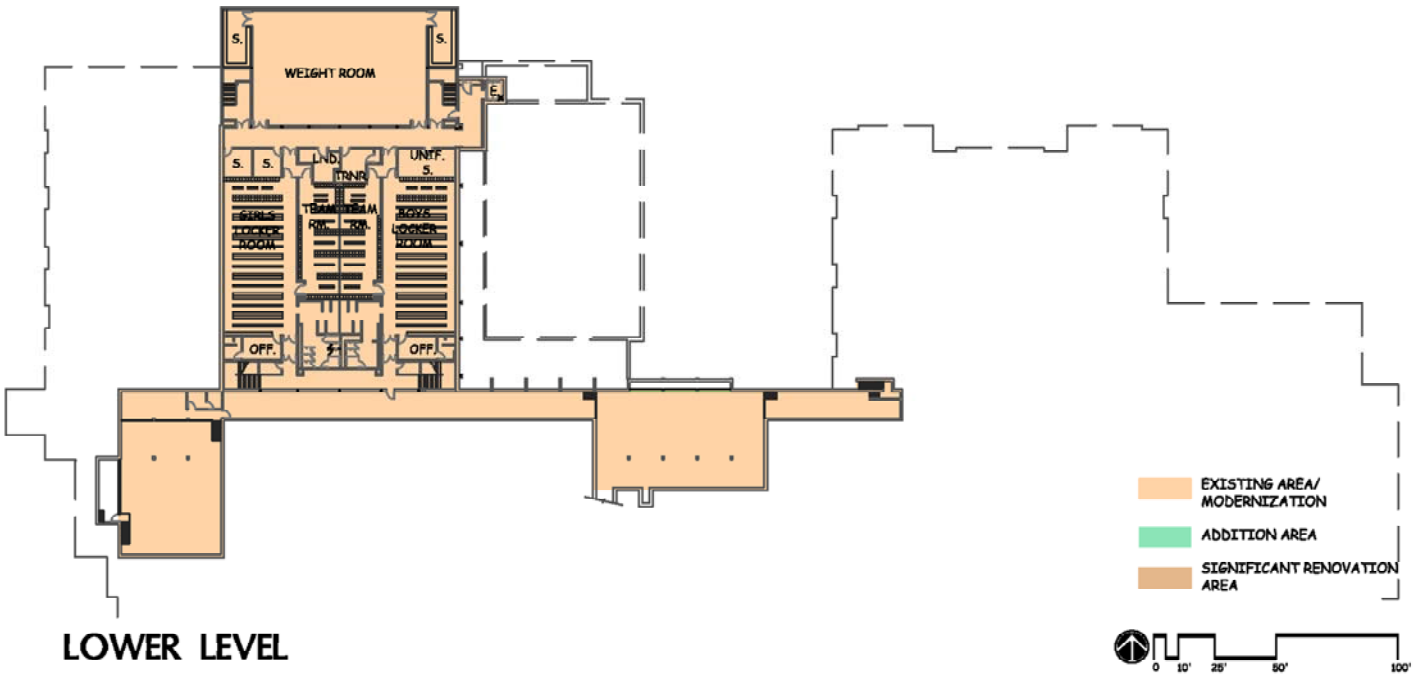
# VICINITY MAP





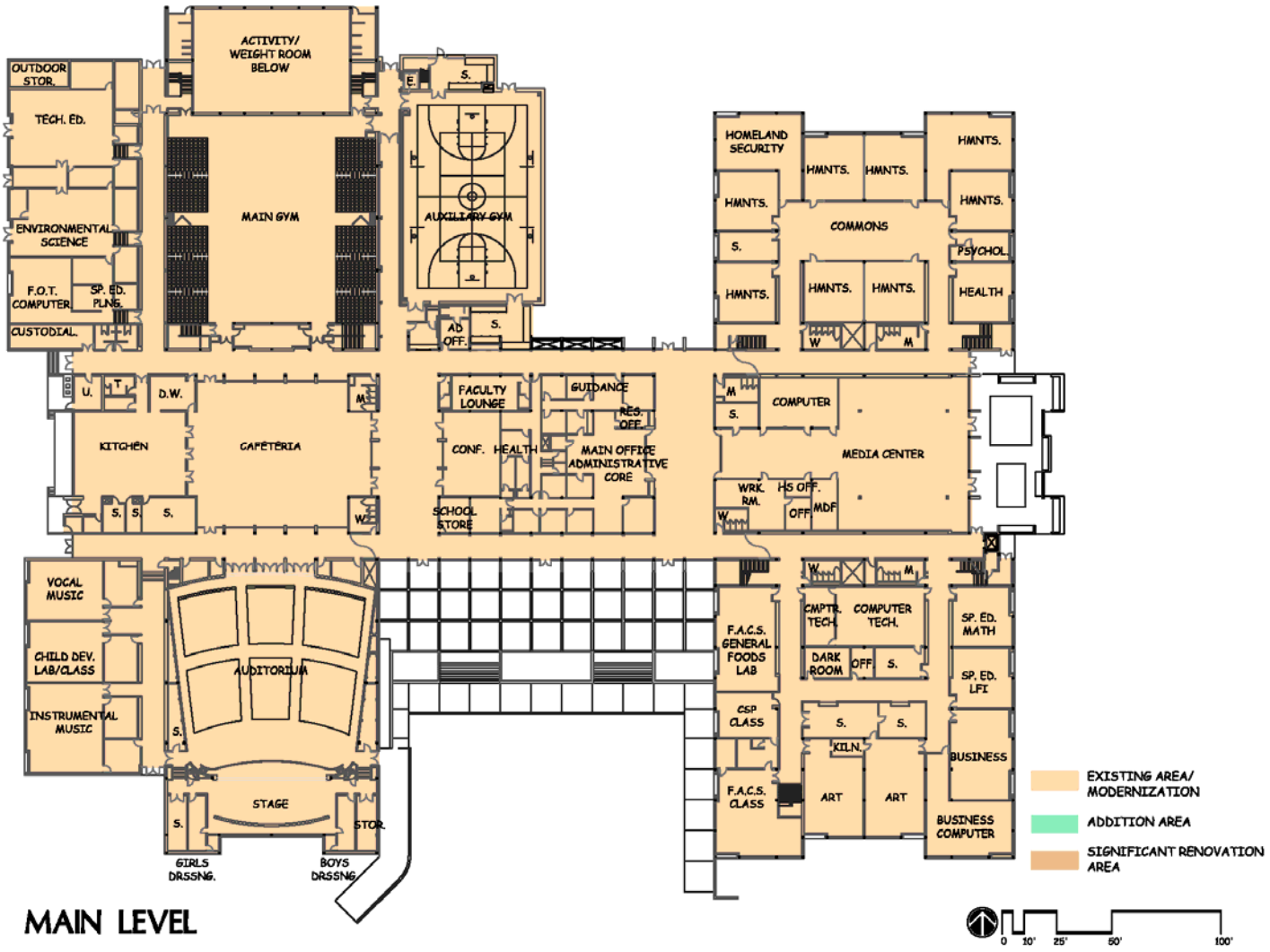

# Joppatowne High School
# Existing Conditions Site Plan

## EXISTING CONFIGURATION




LOWER LEVEL

# EXISTING CONFIGURATION




## MAIN LEVEL

## EXISTING CONFIGURATION


## SECOND FLOOR LEVEL

# 3

# Site Options Summary

# SITE CONCEPT SUMMARIES

## COMPREHENSIVE ADDITION/MODERNIZATION SITE CONCEPT

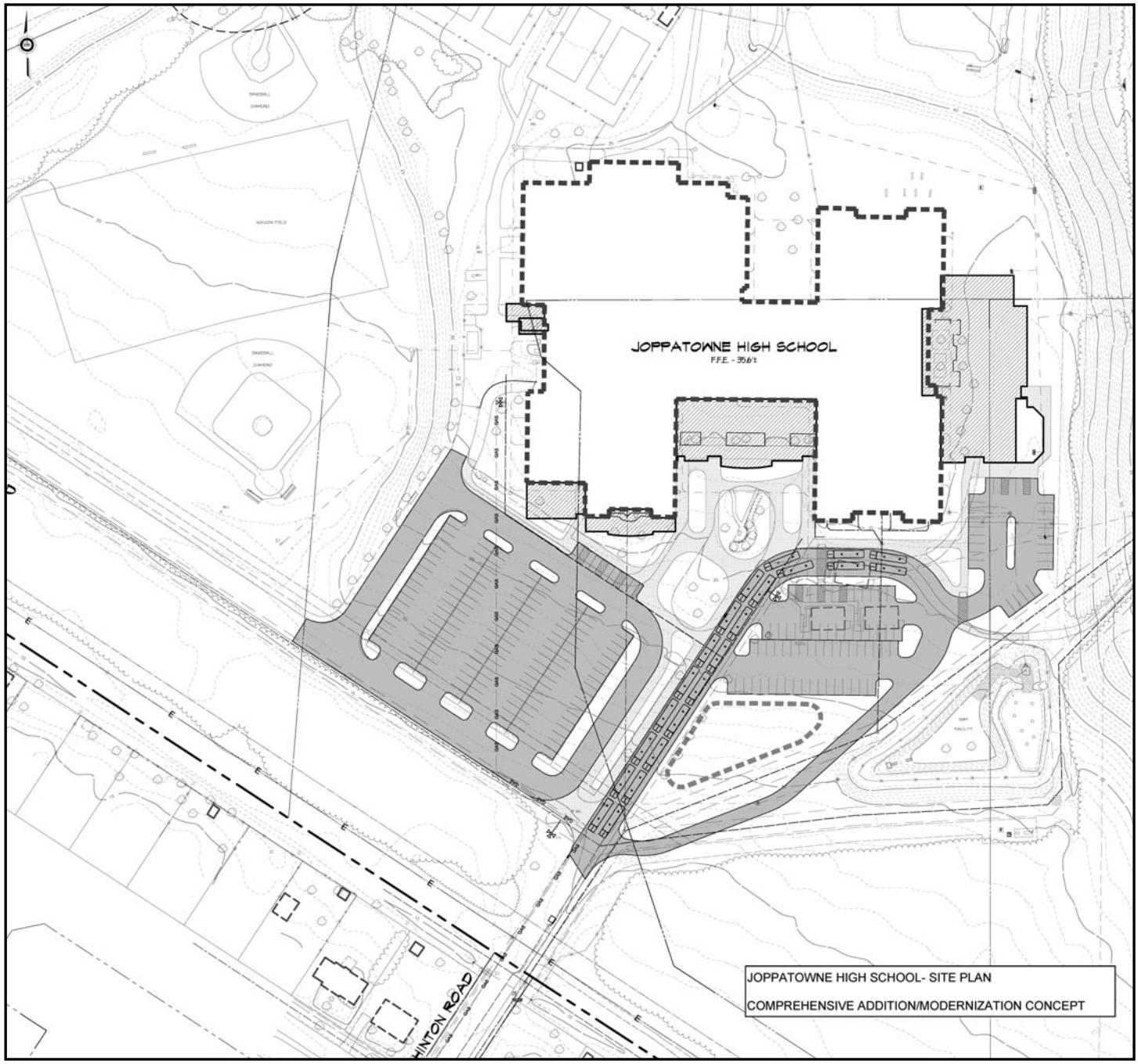
Three bus loop, parking and site circulation options were explored. The proposed building construction options are consistent in placing new construction to the east and south of the existing facility. As such the differences in the site options are subtle and deal primarily with the bus circulation. The presented site option detailed in this report was selected by the Committee.

The property is currently accessed off of Joppa Farm Road via Clinton Road (closest to the main entrance) and Falconer Road to the west side of the property. The existing parking lot is to the southwest of the building with parallel parking extending on the roadway to Falconer Road. Monitors on-site direct bus and automobile traffic in the morning arrivals and afternoon dismissals.

The presented option makes strides to separation of bus and automobile traffic. Busses will arrive from Clinton Road and make a loop to the east to form a double stack configuration along the existing road. Additional parking is planned in the center of the loop. This is primarily meant for staff who will arrive prior to the morning bus circulation. A small additional lot is provided near the east side classroom addition. This will serve for pick-up and drop-off for the Child Development program and after-hours parking for use of the Emergency Operations Center.

The existing parking lot to the southwest will be resurfaced and reconfigured. Parking spaces will be striped to current standards. The revised drive configuration will provide student drop-off along the median between the bus loop and the main entry. Handicapped accessible parking will be expanded and provided adjacent to the building in two of three locations.

A “mountable curb” will be developed at the lower parking roadway and the Clinton Road bus loop. Essentially on a day-to-day basis, busses, staff, and visitors will use Clinton Road. Students driving and student drop-off will use the Falconer Road entrance. Emergency vehicles will be able to traverse the mountable curb.




# Joppatowne High School
# Comprehensive Addition/Modernization
# Concept Site Plan

# BUILDING REPLACEMENT CONCEPTS SUMMARY

Recent projects for Bel Air High School and Edgewood High School have been accomplished as full facility replacement projects. Existing facilities were demolished after new construction was completed for parking, playfields and such. These projects are partial three-story configurations and accommodate a 1,600 student capacity.

Two facility replacement options were explored. The unique characteristics of the Joppatowne High School site with its rolling topography, wooded areas and limited access limit the possibilities for a replacement concept. The footprint of the Edgewood High School was used for the site replacement concepts. Below are listed advantages and disadvantages of such a concept.

**PROS**

1. A new building would meet current ED Specs and be more energy efficient.

2. Bus and Car traffic is completely separated resulting in increased pedestrian safety.

3. The schools athletic fields are more concentrated together making them more mutually accessible.

4. This building location provides for greater vehicle accessibility, as entrances would be located on all three of the major roads that surround the site.

5. Provides approximately 350 to 400+/- parking spaces for teachers, students, and faculty.

6. Provides for an updated and improved athletic stadium.

**CONS**

1. The only reasonable location for a replacement building is on the site of the existing athletic stadium for reasons of drainage, size and maintaining continued occupancy of the current building through construction of the replacement.

2. The difficult topography on the existing site would cause for much more extensive earthwork and grading operations in order to construct the new building. The site would be disturbed to a far greater degree and may expose unknown issues regarding subsurface conditions such as rock or poor soil structural qualities. A proposed Trimble Road entrance would require some difficult grading as the northwest portion of the property where the road would be located is already at a 10% slope.

3. *Concept # 1 Only* - The school building exterior would need to accommodate the slope that exists where the current athletic stadium is located. (This could be accomplished by

designing the building in a 'walk out' condition, with the front entrance of the building at ground level, and the back entrance of the building at basement level.)

4. Proposed water and sewer utilities would need to be extended back to the new building location resulting in a higher cost to design and construct.

5. In order to separate bus and car traffic: either access to Trimble road must be created; or, separate access to Hinton Road and Falconer Road must be utilized.

6. With the replacement building sited on the existing athletic stadium using Hinton and Falconer Roads as the access points will cutoff pedestrian traffic between the building and the stadium and practice fields, resulting in safety concerns.

7. Trimble Road would have to be improved in order to establish ingress and egress for the school. A left turn lane and a bypass lane would need to be installed, along with a right turn deceleration lane and a traffic signal to control movement through the intersection during school hours.

8. The functional spaces within the building do not relate well to their related uses on the exterior of the building. The athletic stadium is separated from the school by the student/faculty parking lot. The auditorium is located on the opposite side of the building away from the student/faculty parking lot.

9. The new school building's proximity to adjacent residential areas has increased due to the building new location. This may result in a greater impact on the surrounding communities.

10. The increase in impervious area would require more stormwater management facilities to manage the increase in runoff that is being created.

11. Athletic stadium would be replaced entirely.

12. One baseball diamond and one basketball hard-court have been eliminated.

13. Access to Trimble Road may generate non-tidal wetland impacts.


# Joppatowne High School
# Replacement Concept Site Plan 1


# Joppatowne High School
# Replacement Concept Site Plan 2

# 4

# Facility Addition/ Modernization Concept Summaries

# CONCEPT SUMMARIES

## GENERAL SUMMARY

There are various items that are common to all of the concepts presented.

- The Mechanical, Plumbing and Electrical Report notes that any further Additions to the facility will require a new/upgraded domestic water service to support the fire sprinkler system. The water service currently enters the building at the west side in the Kitchen/Loading area. The existing water service is a 6" service for domestic water and fire protection.
- The major components of the existing chilled water VAV air handling units including fans, motors, drives, and coils should be replaced to extend the service life of this equipment.
- The Mechanical, Plumbing and Electrical Report notes that any further Additions to the facility will require a new/upgraded electrical service. The existing service is a 3,000 amp service which will need to be upgraded to a 4,000 amp service.
- More detailed MEP recommendations are listed in "Recommended Systemic Building Improvements".
- Improvements were planned and documented at the existing Activity Room area to the north of the Main Gymnasium as alternates in the recently completed Auxiliary Gymnasium Addition & Improvements to the facility. The alternates were not accepted due to budgetary constraints. The Committee felt strongly that these improvements should be incorporated with any new construction. The improvements will provide a new floor structure in the existing space that will provide an Activity Room (Aerobics) and Wrestling Room at the Main Gym level. At the Lower Level, the space will be configured for the Weight Room, an Athletics Office for supervision and additional storage. Graphically, the Lower Level Improvements are indicated with the Concept D, but apply to all of the Development Concepts.
- Large Commons Areas at each level of the North classroom wing are not used as such and are primarily circulation spaces. All concepts propose construction of approximately 500 s.f. Teacher Planning areas and 500 s.f. Seminar spaces at each level.

# RECOMMENDED SYSTEMIC BUILDING IMPROVEMENTS

Following are recommended improvements to the existing facility regardless of an approved Addition/Modernization Option. The improvements are listed in order corresponding to the standard sixteen-division CSI format for project specifications and schedules of values. They are not listed in a particular priority.

Alternate funding for these items may possibly be sought through the State Aging Schools Program.

- Remove and replace existing sub grade perimeter storm drain system. The existing system is terra cotta piping that was found to be occluded and with limited flow when encountered with the recent Auxiliary Gymnasium construction. The piping should be replaced with cast-iron. This process will involve significant excavation and backfilling around the perimeter of the building.
  Approximate Budget Impact $125,000

- Concrete slab and interior walls have settled in some areas most notably at the stage and dressing areas. The Structural Engineer's report determined this is due to settlement of soil below the slabs which may not have been compacted and prepared adequately. The report noted this is primarily a nuisance and cosmetic issue, not a major structural concern to the load-bearing elements of the facility in this area. *Note*: if the Comprehensive Addition/Modernization Concept or the Addition/Renovation Concept B-1 is approved this area will be addressed with proposed improvements to the Stage area.
  Approximate Budget Impact $85,000

- Remove/replace brick veneer along south walls of the Auditorium Stage and Instrumental Music areas. Stained brick has been evident on the exterior of the facility for some time. The Structural Engineer's report determined that water has gotten into the cavity behind the brick and has compromised the wall reinforcement and brick mortar in many areas. It is likely that water is not able to weep from the cavity as necessary. The process will be; remove existing brick veneer, treat the CMU back up wall with fluid applied air/vapor barrier, install new brick tie system, install new brick veneer to match existing building. *Note:* if The Comprehensive Addition/Modernization Concept or Addition Renovation Concept B-1 is approved and implemented this process will only be necessary at the Instrumental Music south wall.
  Approximate Budget Impact $185,000

- Replace majority of existing building roofing. With the exception of the recent Auxiliary Gymnasium Addition, the existing building roof is beyond warranty. Removal and replacement with improved insulation values and updated roof system specification will significantly reduce water infiltration into the building and improve energy and comfort performance. Existing skylights should be removed and new roof decking over the existing openings should take place with this improvement.
  Approximate Budget Impact $2,180,000

- Remove and replace all exterior windows with new aluminum thermally broken frames, with operable sections in classroom areas. Window glazing should be 1"- insulated units comprised of two ¼" glass layers with ½" sealed air separation. Glazing should be "Low-E" for improved energy and comfort performance.
  Approximate Budget Impact $575,000

- Replace majority of existing door hardware with ADA compliant lever handle hardware. Most paired door openings are 5'-4" in width making each door leaf non-compliant. Often door leaf replacement within existing frames can be installed with a 3' leaf and 2'-4" leaf to convert to an ADA compliant door.
  Approximate Budget Impact $150,000

- Replace existing exterior doors with FRP type doors with continuous hinges, improved hardware, and durable face sheets. The new doors will be more secure, durable and energy efficient.
  Approximate Budget Impact $65,000

- Replace existing aged vinyl composition tile and carpet in area not affected by renovation/modernization work. Existing terrazzo corridor finishes are generally sufficient with some repairs necessary at cracked areas.
  Approximate Budget Impact $450,000

- Remove and replace existing metal pan ceiling system in approximately 75% of the existing facility. Ceilings in the Science Area were replaced with the mid-nineties renovation. The tile itself in that are should be replaced.
  Approximate Budget Impact $550,000

- Replace all metal partitions with new solid-plastic type partition system. The current size and configuration of some of the existing toilet rooms may limit full ADA compliance though many improvements can be made.
  Approximate Budget Impact $125,000

- Replace existing metal student lockers. Many of the lockers are original to the building and not of size/width to accommodate today's use of book bags, athletic bags and such. Many of the lockers have dual compartment for a single student.
  Approximate Budget Impact $250,000

- Replace virtually all toilet and lavatory fixtures in toilets. New fixtures can incorporate sensor flushing devices and low-flow type fixtures to reduce water usage. New lavatory hardware can improve ADA compliance. Existing full-length urinals are no longer approved by code and have sanitation concerns.
  Approximate Budget Impact $375,000

- Replace majority of existing HVAC air handlers and pumps recommended in the Mechanical, Plumbing and Electrical Engineer's report that is well beyond its expected service life. The improvement will improve energy efficiency and occupant comfort.
  Approximate Budget Impact $2,550,000

- Replace existing building interior lighting. Existing lighting levels are very low in many areas. Lighting fixtures can be replaced with more energy efficient lamps and ballasts that produce higher lighting outputs.
  Approximate Budget Impact $850,000

- Stadium Press-Box Improvements, stadium bleacher ADA access improvements.
  Approximate Budget Impact $1,150,000

- Stadium turf replacement.
  Approximate Budget Impact $1,100,000

# 5

# Development Concepts

# DEVELOPMENT CONCEPTS

## ADDITION CONCEPT A

| | EXISTING AREA | SIGNIFICANT RENOVATION | ADDITION | TOTAL |
|---|---|---|---|---|
| Lower Level | 24,389 S.F. | 4,113 S.F. | N.A. | 24,389 S.F. |
| Main Level | 125,468 S.F. | 4,850 S.F. | 18,118 S.F. | 143,586 S.F. |
| Upper Level | 34,213 S.F. | 2,510 S.F. | 16,072 S.F. | 48,874 S.F. |
| | *1,411 S.F. (Demolition of Second Floor Connector)* | | | |
| TOTAL | **182,659 S.F.** | **11,473 S.F.** | **34,190 S.F.** | **216,849 S.F**. |

**CONSTRUCTION COST ESTIMATE $22,265,000**
**(Includes $10,765,000 System Building Improvements)**
**CONSTRUCTION PERIOD ESTIMATE 15-18 months**

The focus of the initial Concept A is to address the basic requirement of the increased student capacity as part of the Homeland Security Magnet.

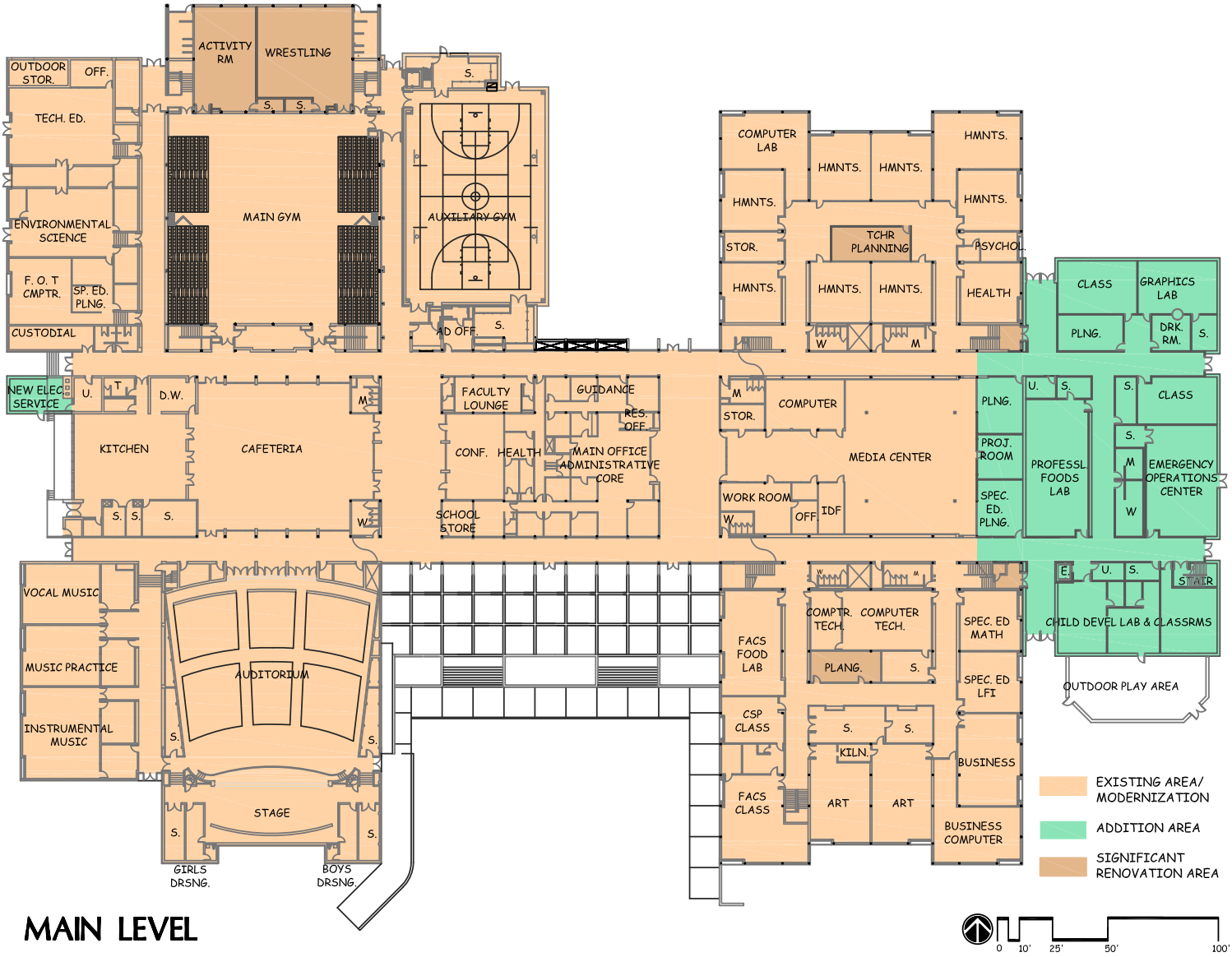
ADVANTAGES

- Concise foot print of the Addition limits disturbance of the site.
- Construction can be easily phased to allow continued occupancy of the facility. Estimated construction period of approximately eighteen months.
- Limited areas of renovation can be primarily addressed during summer times with the exception of improvements to the Activity Area north of the Main Gymnasium.
- Proposed Emergency Operations Center can be easily isolated for after-hours uses by County Agencies.
- The majority of the Homeland Security Magnet program spaces are on the second floor of the Addition allowing a zone identity to the program.
- The main level interstitial space between the Addition and the existing Media Center are combined into Planning/Seminar areas and a Project Room for the Media Center.
- The second level metal framed corridor across the Media Center roof area is demolished and a circulation path is directed through the Addition.

DISADVANTAGES

- The added student capacity must circulate to the two prime corridors at the main level to access other functions of the facility.
- The proposed concept does not address space and adjacency issues of the existing facility.

# ADDITION / RENOVATION CONCEPT A




## MAIN LEVEL

# ADDITION / RENOVATION CONCEPT A


## SECOND FLOOR LEVEL

# DEVELOPMENT CONCEPTS

## ADDITION / MODERNIZATION CONCEPT B

| | EXISTING AREA | SIGNIFICANT RENOVATION | ADDITION | TOTAL |
|---|---|---|---|---|
| Lower Level | 24,389 S.F. | 4,113 S.F. | N.A. | 24,389 S.F. |
| Main Level | 125,468 S.F. | 22,533 S.F. | 26,883 S.F. | 152,351 S.F. |
| Upper Level | 34,213 S.F. | 2,510 S.F. | 16,072 S.F. | 48,874 S.F. |
| | *1,411 S.F. (Demolition of Second Floor Connector)* | | | |
| TOTAL | **182,659 S.F.** | **29,156 S.F.** | **42,955 S.F.** | **225,614 S.F**. |

**CONSTRUCTION COST ESTIMATE $25,465,000**
**(Includes $10,765,000 System Building Improvements)**
**CONSTRUCTION PERIOD ESTIMATE 18-24 months**

Concept B further develops Concept A to begin to address some of the primary space and adjacency issues of the existing facility. A single story Addition is incorporated in the central south side of the facility for a new Administrative core.

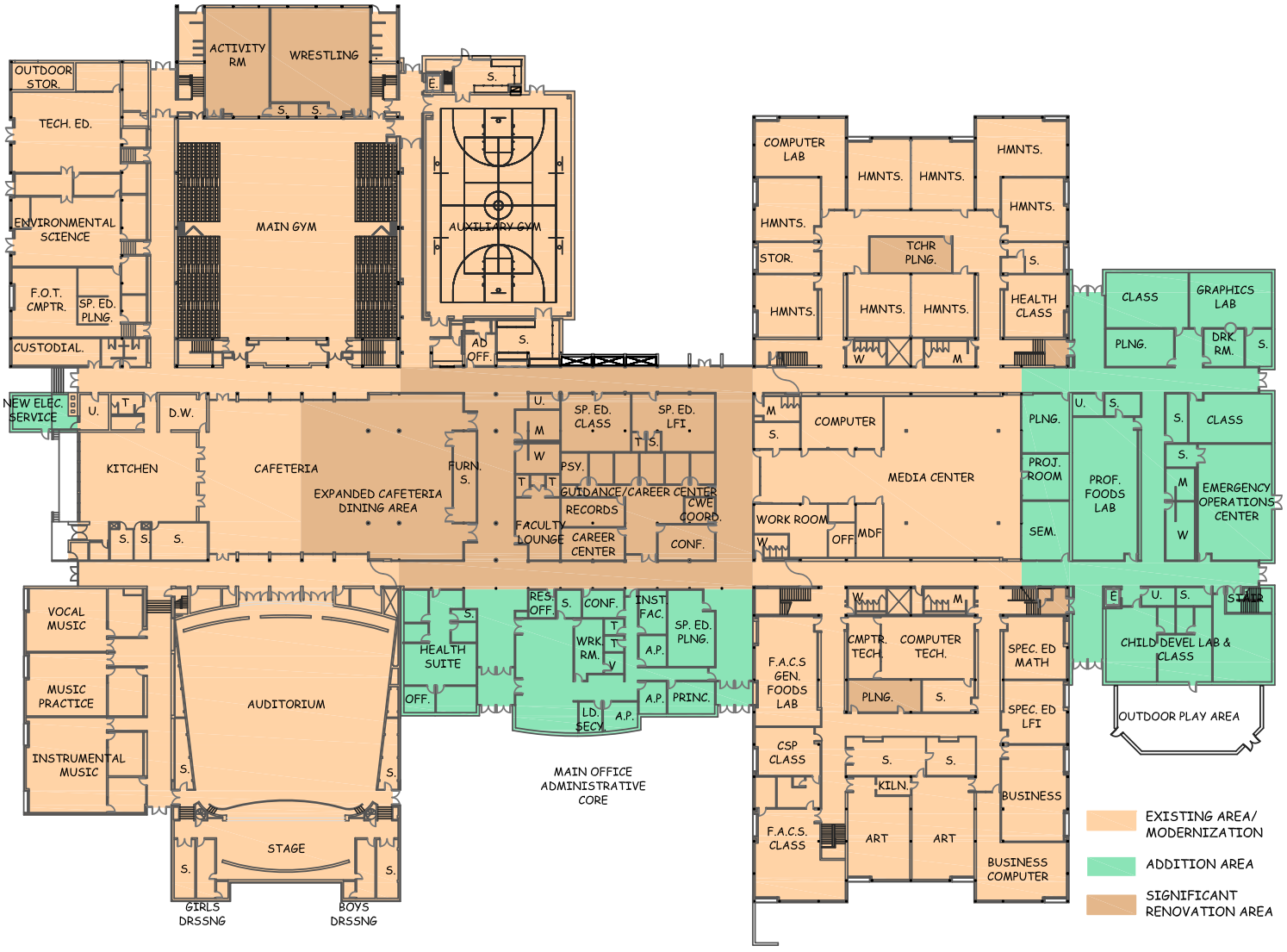
ADVANTAGES

- Addition construction is in concise footprints that can be divided into clear phasing packages. Estimated construction period of approximately eighteen to twenty-four months.
- Proposed Emergency Operations Center can be easily isolated for after-hours uses by County Agencies.
- The majority of the Homeland Security Magnet program spaces are on the second floor of the Addition allowing a zone identity to the program.
- The main level interstitial space between the Addition and the existing Media Center are combined into Planning/Seminar areas and a Project Room for the Media Center.
- The second level metal framed corridor across the Media Center roof area is demolished and a circulation path is directed through the Addition.
- The single story Addition to the south central area of the building gives the Administration function improved visual access to the primary arrival paths to the building. Configuration of the entry lobby provides improved security by directing all visitors through the office after initial arrival.
- A new Health Suite is incorporated into the Addition that is expanded and meets current IAC Guidelines.
- Renovation of the existing central core brings the Guidance and Career Center inline with current standards. Special Education Classroom Spaces are more centralized along with Special Education Planning in the addition area.
- Renovation of the existing central core area also incorporates an expansion to the Dining Area in the Cafeteria to better accommodate the increased student capacity.
- Expanded ADA compliant toilets are incorporated in the existing central core for adequate service to after-hours events in the Gymnasiums and Auditorium.

DISADVANTAGES

- The added student capacity must circulate to the two prime corridors at the main level to access other functions of the facility.
- The expanded construction adds additional layers and intricacies to the construction phasing. The front addition will temporarily isolate the existing Administrative core. An alternate entry using the corridor west of the Auditorium may be necessary for a short time.

# ADDITION / RENOVATION CONCEPT B




## MAIN LEVEL

# ADDITION / RENOVATION CONCEPT B


## SECOND FLOOR LEVEL

# DEVELOPMENT CONCEPTS

## ADDITION / MODERNIZATION CONCEPT C

| | EXISTING AREA | SIGNIFICANT RENOVATION | ADDITION | TOTAL |
|---|---|---|---|---|
| Lower Level | 24,389 S.F. | 4,113 S.F. | N.A. | 24,389 S.F. |
| Main Level | 125,468 S.F. | 31,528 S.F. | 25,972 S.F. | 151,440 S.F. |
| Upper Level | 34,213 S.F. | 1,396 S.F. | 16,176 S.F. | 50,389 S.F. |
| TOTAL | **184,070 S.F.** | **37,091 S.F.** | **42,148 S.F.** | **226,218 S.F**. |

**CONSTRUCTION COST ESTIMATE $26,015,000**
**(Includes $10,765,000 System Building Improvements)**
**CONSTRUCTION PERIOD ESTIMATE 24-30 months**

Concept C concentrates the majority of the construct at the south central portion of the existing facility in a two story Addition comprising the Administrative Core, Emergency Operations Center Health Suite and classroom spaces serving the Family & Consumer Sciences department. The Homeland Security Magnet Program classroom spaces are centered in the second floor of the major addition. A single story classroom Addition to the east side of the existing classroom wing comprises classrooms displaced by other construction and the Child Development Lab.

ADVANTAGES

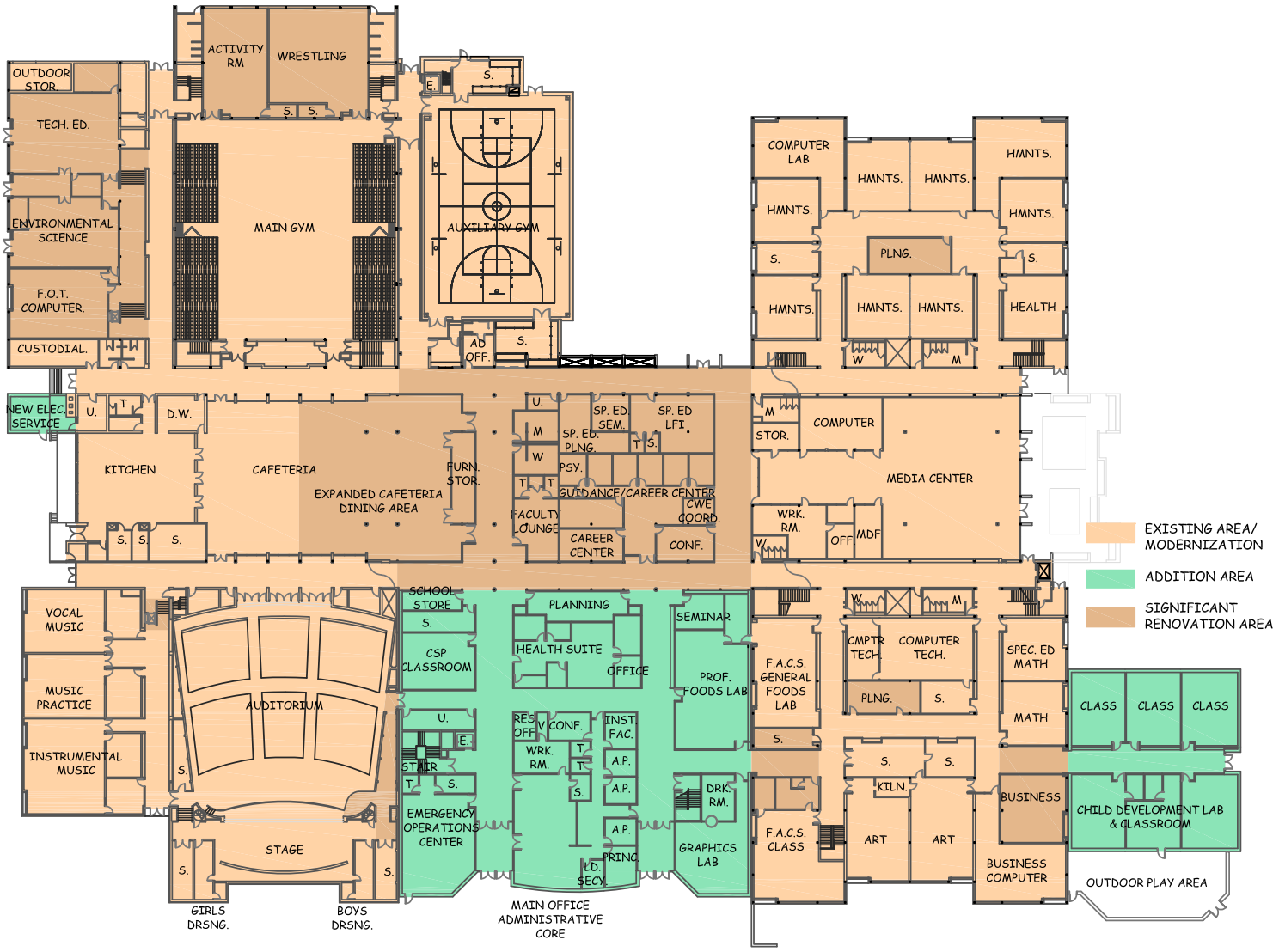
- The concentrated Addition at the south central portion of the facility will lend Joppatowne High School a new visual identity. As well, the Homeland Security Magnet is positioned prominently for its own identity on the second floor of the addition.
- Proposed Emergency Operations Center can be easily isolated for after-hours uses by County Agencies.
- The larger Addition to the south central area of the building pushes the Administration function to the face of the building providing optimum visual access to the primary arrival paths to the building. Configuration of the entry lobby provides improved security by directing all visitors through the office after initial arrival.
- Vertical circulation is provided immediately after the entry lobby dispersing the student circulation. No longer are all of the students from classroom wings loaded into the two primary corridors to reach other functions of the facility.
- The larger central Addition incorporates improved zoning of the Family & Consumer Sciences functions with the new Professional Foods Lab adjacent to the existing F&CS Food Lab.
- The larger central Addition incorporates the CSP Classroom as a space built for its unique needs in lieu of occupying an existing classroom.
- A new Health Suite is incorporated into the Addition that is expanded and meets current IAC Guidelines.

- Renovation of the existing central core brings the Guidance and Career Center inline with current standards. Special Education Classroom Spaces are more centralized along with Special Education Planning in the Addition area.
- Renovation of the existing central core area also incorporates an expansion to the Dining Area in the Cafeteria to better accommodate the increased student capacity.
- Expanded ADA compliant toilets are incorporated in the existing central core for adequate service to after-hours events in the Gymnasiums and Auditorium.
- Modifications to a side storage area of the Auditorium will allow wheelchair access to the Stage.
- A wheel chair lift is incorporated into the Stairs of the corridor west of the Auditorium providing adequate accessibility to the Music Instruction Spaces.
- The existing Tech Wing is renovated to provide accessibility to the classroom floor level. The classroom spaces are renovated to better suite instructional purposes in lieu of converted shop areas. New HVAC is provided to the wing which is now only heated and ventilated.
- The primary Addition to the south allows continued window exposure for the Media Center.

DISADVANTAGES

- The significant construction at the south central portion of the existing facility will make for a complicated construction phasing sequence. The front Addition will temporarily isolate the existing Administrative core. An alternate entry using the corridor west of the Auditorium will most likely be necessary for at least a semester. A phased construction sequence can be anticipated to be twenty-four to thirty months.

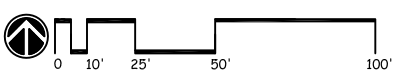
# ADDITION / RENOVATION CONCEPT C




## MAIN LEVEL

# ADDITION / RENOVATION CONCEPT C


## SECOND FLOOR LEVEL



# 6

# Preferred Concept D

# PREFERRED CONCEPT

## COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D

| | EXISTING AREA | SIGNIFICANT RENOVATION | ADDITION | TOTAL |
|---|---|---|---|---|
| Lower Level | 24,389 S.F. | 4,113 S.F. | N.A. | 24,389 S.F. |
| Main Level | 125,468 S.F. | 38,000 S.F. | 36,439 S.F. | 161,907 S.F. |
| Upper Level | 34,213 S.F. | 2,800 S.F. | 18,992 S.F. | 51,794 S.F. |
| | *1,411 S.F. (Demolition of Second Floor Connector)* | | | |
| TOTAL | **182,659 S.F.** | **44,913 S.F.** | **55,431 S.F.** | **238,090 S.F**. |

**CONSTRUCTION COST ESTIMATE $32,550,000**
**(Includes $10,765,000 System Building Improvements)**
**CONSTRUCTION PERIOD ESTIMATE 28-36 months**

The preferred Comprehensive Addition/Modernization Concept represents a culmination of the finer points of the Development Concepts A-C with regard to instructional spaces for the Homeland Security Magnet Program, Emergency Operations Center, Professional Foods Lab, Graphics Lab and Dark Room Lab. A deeper review of critical instructional spaces present in recent Harford County High School Projects which are not present in the current facility identified the following for inclusion in an expanded Addition/Addition concept:

Custodial Services – Storage & Receiving – Approx. 700 s.f.
Communications/Video Studio – Approx. 1,700 s.f. to be located near the Media Center
Journalism Lab – Approx. 375 s.f. Preferably located adjacent to a Classroom with visual access between.
Sculpture Studio – Approx. 900 s.f. Ideally located in proximity to other Arts spaces.
Keyboard Lab – 750 s.f. This may be incorporated in the space between Instrumental and Vocal Music Rooms which will be vacated with the relocation of the Child Development Lab in the Addition.
Black Box Studio and Sound Control – 1,830 s.f. to be located in proximity to the Auditorium, stage, and dressing spaces.

The Committee felt this concept best addressed the concerns of the proposed increased student capacity requirement and resolved the major issues of the existing facility. The proposed new construction and Modernization is extensive though this concept can be reasonably phased with continued occupancy of the facility over a twenty-eight to thirty-six month construction period.

ADVANTAGES

- The Addition construction is in concise footprints that can be divided into clear phasing packages. Primarily the additional student capacity is accommodated in the two story Classroom Addition to the east of the Media Center. A single story Addition is located to the south central portion of the facility for a new Administrative core.
- The second level metal framed corridor across the Media Center roof area is demolished and a circulation path is directed through the Addition.

- The larger Addition to the south central area of the building pushes the Administration function forward to improve visual access to the primary arrival paths to the building. The new configuration of the entry lobby provides improved security by directing all visitors through the office after initial arrival.
- The larger central Addition incorporates the CSP Classroom as a space built for its unique needs in lieu of occupying an existing Classroom.
- A new Health Suite is incorporated into the Addition that is expanded and meets current IAC Guidelines.
- Renovation of the existing central core brings the Guidance and Career Center inline with current standards. Special Education Classroom Spaces are more centralized along with Special Education Planning in the Addition area.
- Renovation of the existing central core area also incorporates an expansion to the dining area of the Cafeteria to better accommodate the increased student capacity.
- Expanded ADA compliant toilets are incorporated in the central core for adequate service to after-hours events in the Gymnasiums and Auditorium.
- Modifications to a side storage area of the Auditorium will allow wheelchair access to the Stage.
- A small Addition to the south of the existing Stage will provide an increased Stage Area, more consolidated Storage, a Set Construction space and new Dressing Areas for students. This concept will address the unsightly brick condition on the south face of the stage and the settled floor slab in the areas of the existing dressing areas. A new stair is built for access to the catwalk which is currently served by two spiral staircases.
- Black Box Studio and Sound Control Room have been incorporated to the south of the Instrumental Music and adjacent to the Stage Area. Performing Arts spaces are now grouped with the Auditorium.
- Keyboard Lab and Practice Rooms – The existing Child Development Lab between Vocal and Instrumental Music will be renovated to incorporate the Keyboard Lab and Practice Spaces.
- A wheel chair lift is incorporated into the stairs of the corridor west of the Auditorium providing adequate accessibility to the music instruction spaces.
- The existing Tech Wing is renovated to provide accessibility to the Classroom floor level. The Classroom spaces are renovated to better suite instructional purposes in lieu of converted shop areas. New HVAC is provided to the Wing which is now only heated and ventilated.
- A Receiving Area has been added to the Addition structure at the new electric service area adjacent to the existing Custodial Office and Storage.
- The Communications/Video Studio has been incorporated at the ground level of the Addition adjacent to the Media Center. This is in close proximity to the Emergency Operations Center and stairs to access the Homeland Security Magnet spaces above.
- Journalism Lab – a space has not been named as such, however there are several Humanities Classrooms that can be used as a Journalism Lab/Classroom. A Seminar Room has been incorporated adjacent to the Teacher Planning in the B Classroom Wings at both levels. Per the input of the committee, the Seminar Room is adjoining a Classroom and positioned along a circulation corridor that can improve visibility and supervision of a seminar type space.

- Homeland Security Magnet instructional spaces are on the second floor of the east Addition. An additional Classroom (noted as Math/Science Classroom) has been added in the Addition to offset a Classroom lost in with the corridor connection to the second floor A Classroom Wing. There are two seminar rooms included which abut a Classroom and are on the corridor to allow visual supervision.
- Ground Floor East Addition; The Child Development Lab/Classrooms and Emergency Operations Center are oriented to the front side of the facility. The Professional and General Foods Labs have been included in the Addition with joint access to the Laundry and Storage space. A FACS Classroom (Sewing) and FACS Planning space are also included. The Health Classroom and two additional "Freshmen" Classrooms complete the Addition.
- Ground Floor A Classroom Wing. As noted previously, the Sculpture Studio has been incorporated in a previous Business Classroom. The Graphics Lab and Dark Room have also been incorporated adjacent to the Sculpture and other Art Studios. The previous FACS General Foods, CSP, and Sewing Lab are re-configured for the Business Classrooms.
- Ground Floor B Classroom Wing. One stair has been demolished to provide a better link between the existing and Addition. The existing Health Room is now located in the Addition. The existing Psychologist office is now located in the renovated core with Guidance, Career and Special Education Spaces. The existing area is reconfigured for two Classrooms, one noted as Humanities and one as Freshman.

DISADVANTAGES

- The significant construction at the south central portion of the existing facility will make for a complicated construction phasing sequence. The front Addition will temporarily isolate the existing Administrative core. An alternate entry using the corridor west of the Auditorium or the new East Addition will most likely be necessary for a portion of a semester.

**RECOMMENDED SYSTEMIC BUILDING IMPROVEMENTS**

All of the Recommended Systemic Improvements to the existing facility discussed in Item 2 are also to be incorporated into a Comprehensive Addition/Modernization Concept. They are briefly restated below.

- Replace existing sub grade perimeter storm drain system.

- Concrete slab and interior walls have settled in some areas most notably at the stage and dressing areas.

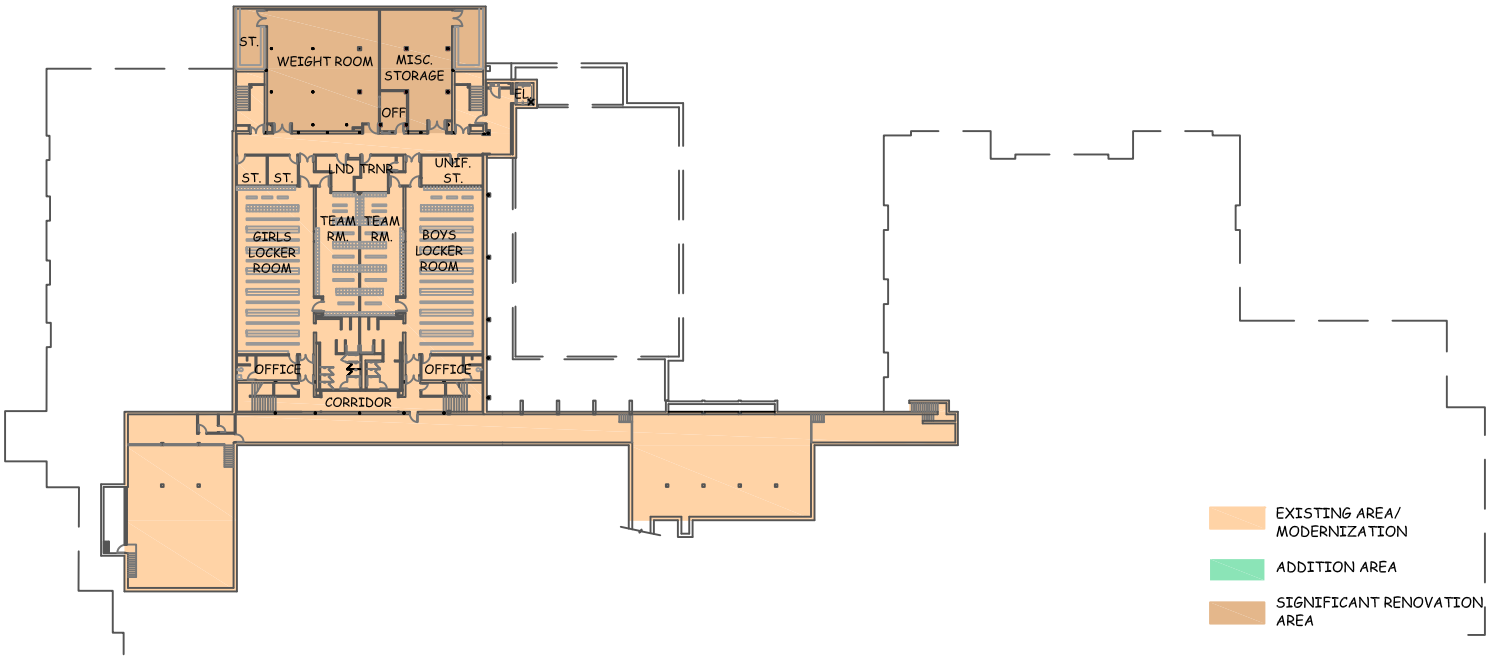
- Replace majority of existing building roofing.

- Replace all exterior windows with new aluminum thermally broken frames, with operable sections in Classroom areas.

- Replace majority of existing door hardware with ADA compliant lever handle hardware.

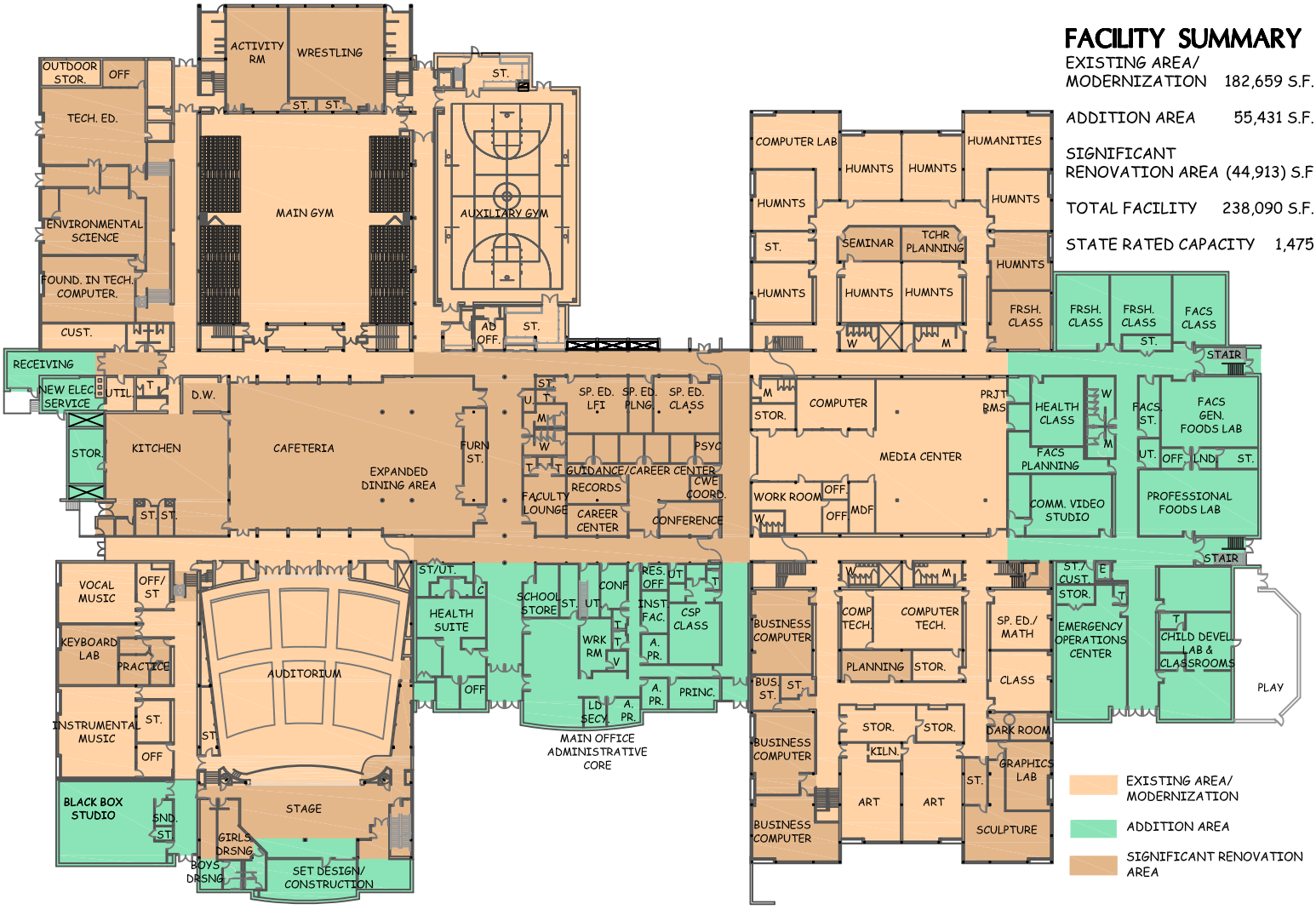
- Replace existing exterior doors with FRP type doors with continuous hinges, improved hardware, and durable face sheets.
- Replace existing aged vinyl composition tile and carpet in area not affected by renovation/modernization work.
- Replace existing metal pan ceiling system.
- Replace all metal toilet partitions with new solid-plastic type partition system.
- Replace existing metal student lockers.
- Replace existing toilet and lavatory fixtures in toilets.
- Replace majority of existing HVAC air handlers and pumps.
- Replace existing building interior lighting.
- Stadium Press-Box Box Improvements, stadium bleacher ADA access improvements.
- Stadium turf replacement.

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D
# COMMON TO ALL CONCEPTS




## LOWER LEVEL

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D




## FACILITY SUMMARY

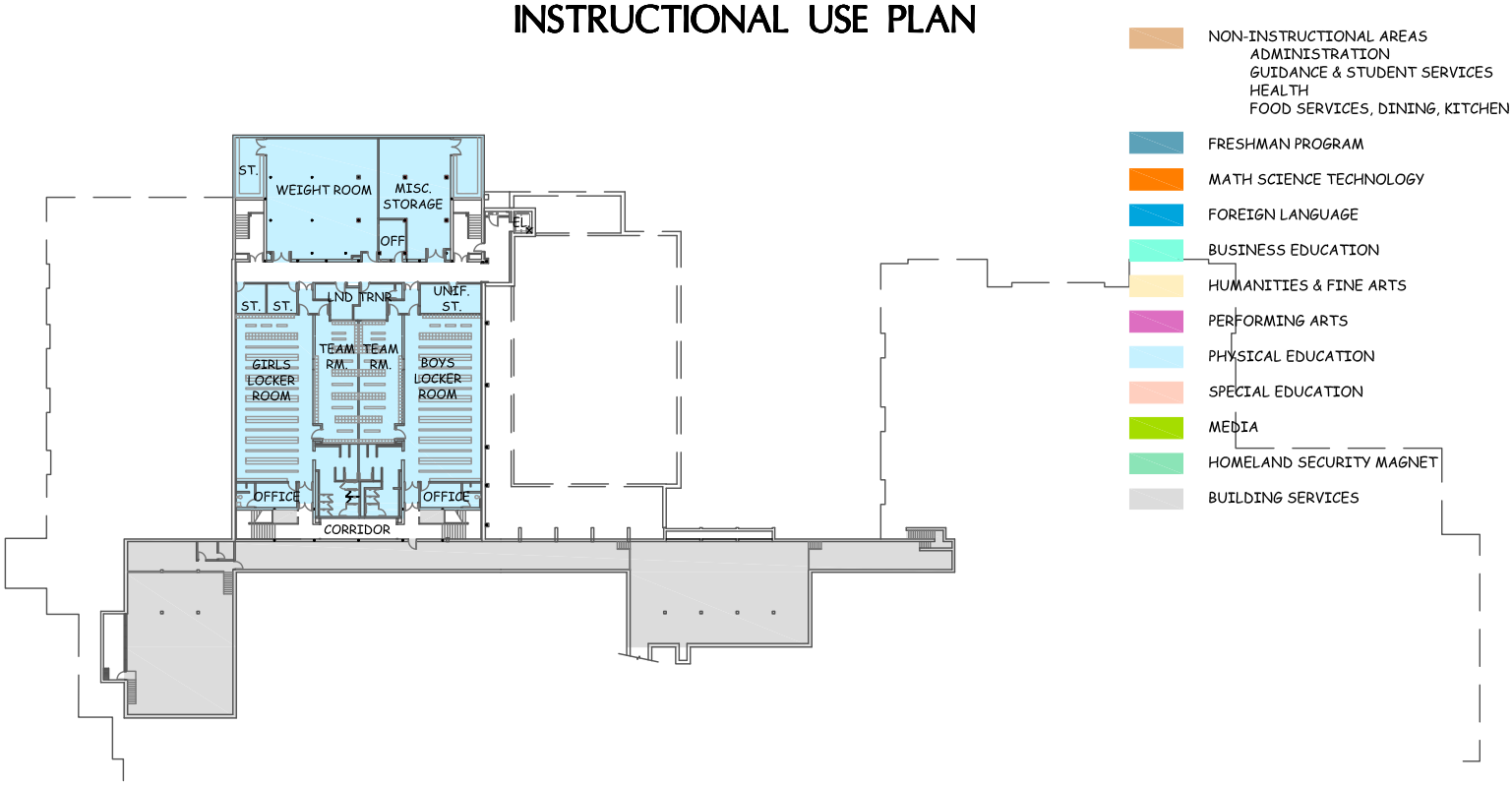
| | |
|---|---|
| EXISTING AREA/ MODERNIZATION | 182,659 S.F. |
| ADDITION AREA | 55,431 S.F. |
| SIGNIFICANT RENOVATION AREA | (44,913) S.F |
| TOTAL FACILITY | 238,090 S.F. |
| STATE RATED CAPACITY | 1,475 |

## MAIN LEVEL

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D


## SECOND FLOOR LEVEL

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D
# INSTRUCTIONAL USE PLAN




NON-INSTRUCTIONAL AREAS
ADMINISTRATION
GUIDANCE & STUDENT SERVICES
HEALTH
FOOD SERVICES, DINING, KITCHEN

FRESHMAN PROGRAM

MATH SCIENCE TECHNOLOGY

FOREIGN LANGUAGE

BUSINESS EDUCATION

HUMANITIES & FINE ARTS

PERFORMING ARTS

PHYSICAL EDUCATION

SPECIAL EDUCATION

MEDIA

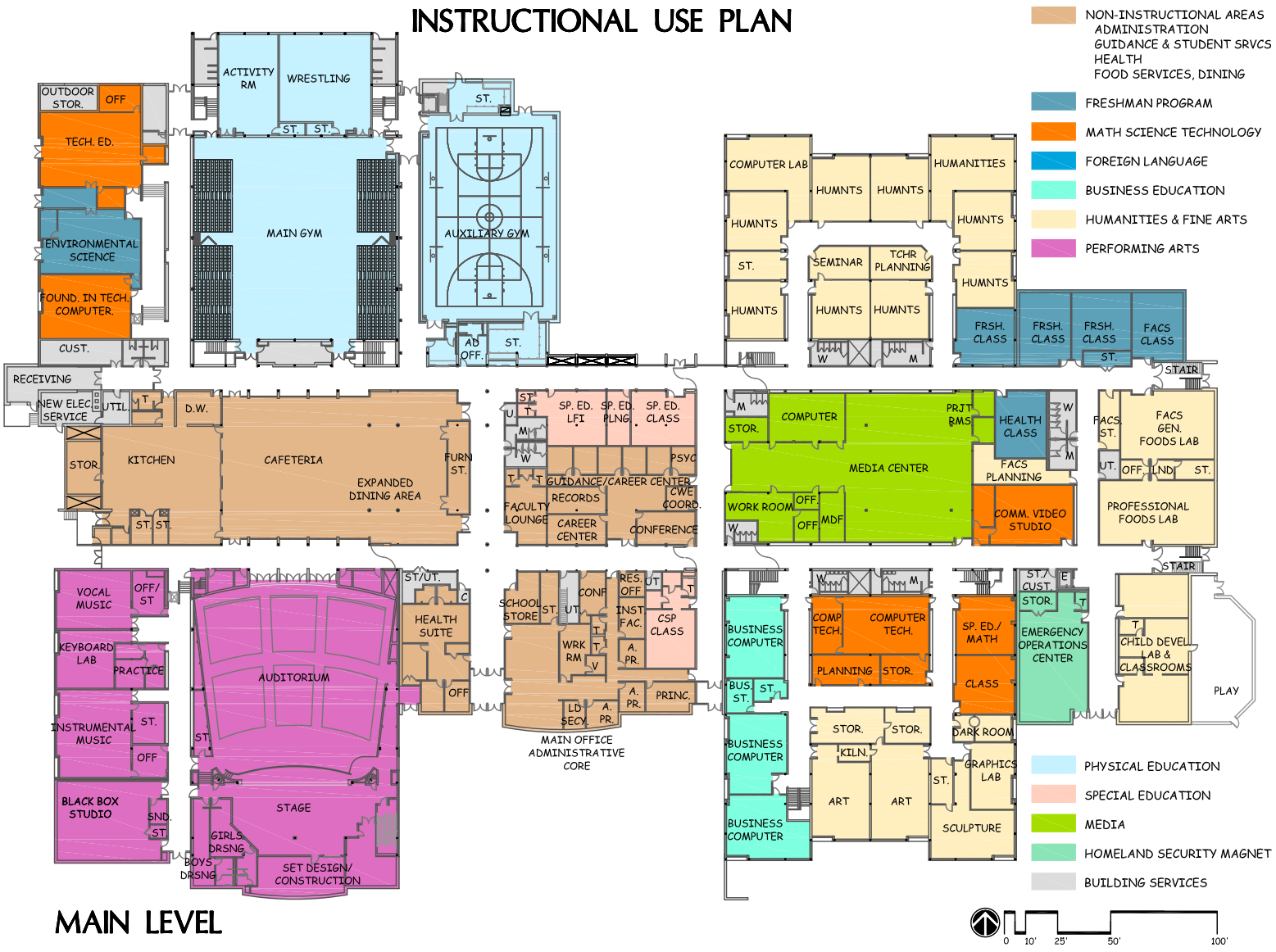
HOMELAND SECURITY MAGNET

BUILDING SERVICES

## LOWER LEVEL

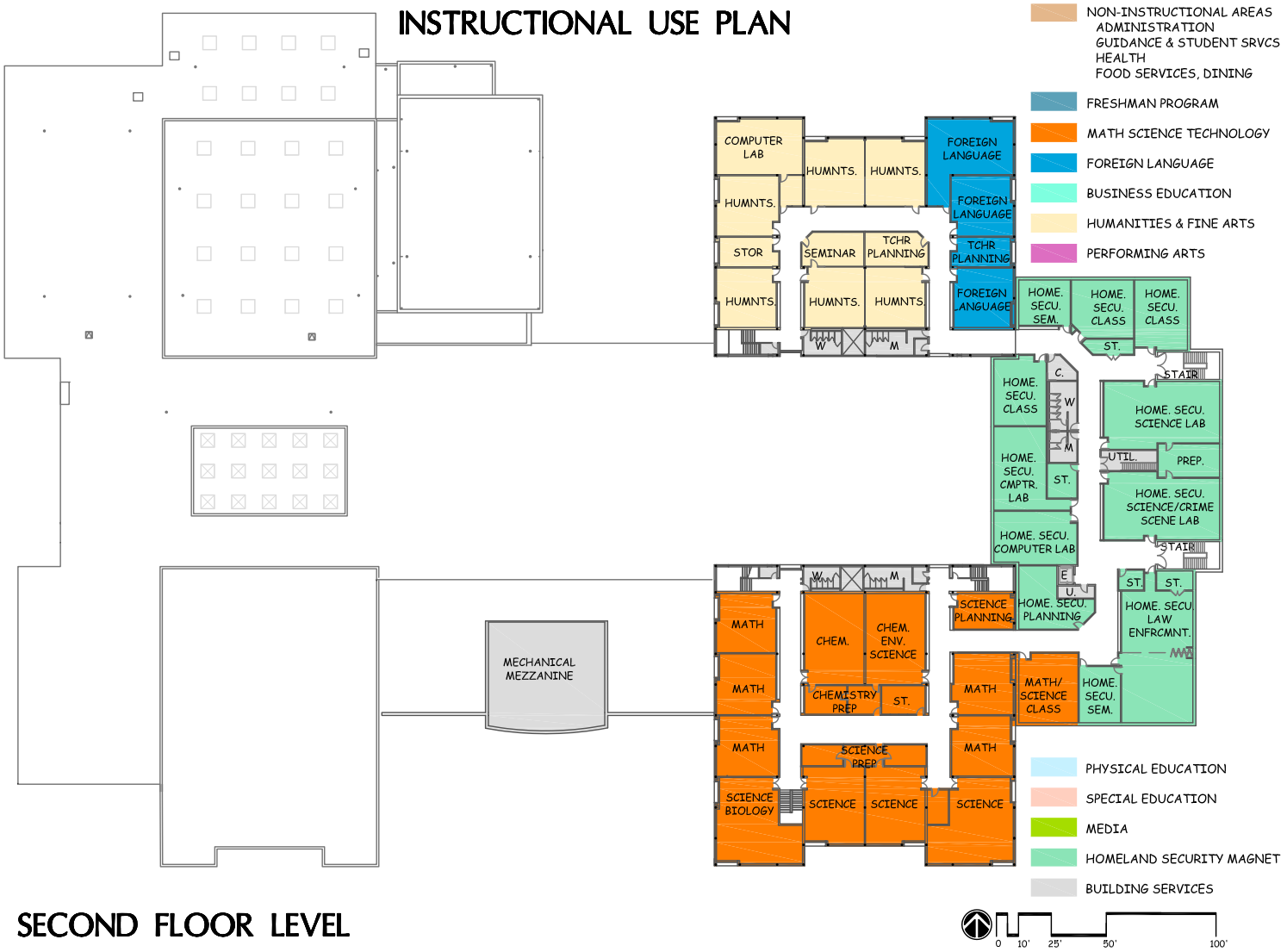
0 10' 25' 50' 100'

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D
## INSTRUCTIONAL USE PLAN




## MAIN LEVEL

# COMPREHENSIVE ADDITION / MODERNIZATION CONCEPT D
## INSTRUCTIONAL USE PLAN




## SECOND FLOOR LEVEL

**COMPARATIVE PROGRAM STUDY**

| | | | | | *Joppatowne High School* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Modernization* | | | *Addition* | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| **Administration** | | | | | | | | | | | | |
| Principal's Office | 1 | 250 | 250 | | | | | 1 | 312 | 312 | | |
| Inst Facilitators Office | 1 | 125 | 125 | | | | | 1 | 230 | 230 | | |
| Assistant Principals' Office | 3 | 175 | 525 | | | | | 1 | 180 | 180 | | |
| | | | | | | | | 1 | 168 | 168 | | |
| | | | | | | | | 1 | 162 | 162 | | |
| Lead Secretary Office | 1 | 150 | 150 | | | | | 1 | 132 | 132 | | |
| Reception & Waiting Rooms | 2 | 100 | 200 | | | | | 1 | 200 | 200 | | |
| General Office | 1 | 1,750 | 1,750 | | | | | 1 | 1800 | 1,800 | | |
| Conference Room | 1 | 200 | 200 | | | | | 1 | 250 | 250 | | |
| School Resource Officer | 1 | 100 | 100 | | | | | 1 | 138 | 138 | | |
| Toilets | 2 | 40 | 80 | | | | | 2 | 40 | 80 | | |
| | | | | 3,380 | | | | | | | 3,652 | |
| | | | | | | | | | | | | |
| **Student Services** | | | | | | | | | | | | |
| General Conference | 1 | 400 | 400 | | 1 | 418 | 418 | | | | | |
| School Store | 1 | 400 | 400 | | | | | 1 | 335 | 335 | | |
| CWE Coordinator | 1 | 150 | 150 | | 1 | 150 | 150 | | | | | |
| Teacher Mentors Office | 1 | 125 | 125 | | 1 | 144 | 144 | | | | | |
| | | | | 1,075 | | | | | | | 1,047 | |
| **Custodial Services** | | | | | | | | | | | | |
| Office | 1 | 400 | 400 | | 1 | 453 | 453 | | | | | |
| Service Closets | 4 | 100 | 400 | | 1 | 200 | 200 | 1 | 300 | 300 | | |
| Storage and Receiving -General | 1 | 700 | 700 | | | | | 1 | 563 | 563 | | |
| Storage - Outside | 1 | 400 | 400 | | 1 | 312 | 312 | | | | | |
| | | | | 1,900 | | | | | | | 1,828 | |
| **Food Service** | | | | | | | | | | | | |
| Dining Areas | 1 | 8,800 | 8,800 | | 1 | 7,500 | 7,500 | | | | | |
| Kitchen | 1 | 4,000 | 4,000 | | 1 | 3,140 | 3,140 | | 400 | 400 | | |
| Faculty Room | 1 | 750 | 750 | | 1 | 651 | 651 | | | | | |
| Furniture Storage | 1 | 400 | 400 | | 1 | 435 | 435 | | | | | |
| | | | | 13,950 | | | | | | | 12,126 | |
| | | | | | | | | | | | | |
| **Guidance** | | | | | | | | | | | | |
| Counselors' Offices | 4 | 150 | 600 | | 4 | 144 | 576 | | | | | |
| Records Room | 1 | 400 | 400 | | 1 | 343 | 343 | | | | | |
| Reception & Waiting | 1 | 1,000 | 1,000 | | 1 | 635 | 635 | | | | | |
| Career Center | 1 | 400 | 400 | | 1 | 387 | 387 | | | | | |
| | | | | 2,400 | | | | | | | 1,941 | |
| | | | | | | | | | | | | |

**COMPARATIVE PROGRAM STUDY**

| | | | | | ***Joppatowne High School*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ***Modernization*** | | | ***Addition*** | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| **Health** | | | | | | | | | | | | |
| Health Suite | 1 | 1,200 | 1,200 | | | | | 1 | 1474 | 1,474 | | |
| | | | | 1,200 | | | | | | | 1,474 | |
| | | | | | | | | | | | | |
| ***Instructional*** | | | | | | | | | | | | |
| **Freshman Program** | | | | | | | | | | | | |
| General Classrooms | 4 | 750 | 3,000 | | 1 | 1,708 | 1,708 | 1 | 753 | 753 | | 3 |
| | | | | | | | | 1 | 773 | 773 | | |
| | | | | | | | | | | | | |
| Health Classroom | 1 | 750 | 750 | | | | | 1 | 735 | 735 | | 1 |
| General Computer Lab | 1 | 750 | 750 | | | | | | | | | |
| Planning Room | 1 | 400 | 400 | | | | | | | | | |
| Storage Room | 1 | 200 | 200 | | | | | 1 | 153 | 153 | | |
| Earth Science Labs | 2 | 1,200 | 2,400 | | 1 | 1,234 | 1,234 | | | | | 1 |
| Science Prep/Storage Room | 1 | 400 | 400 | | 1 | 331 | 331 | | | | | |
| | | | | 7,900 | | | | | | | 5,687 | |
| | | | | | | | | | | | | |
| **Math, Science & Technology** | | | | | | | | | | | | |
| General Classrooms | 11 | 750 | 8,250 | | 1 | 700 | 700 | 1 | 838 | 838 | | 8 |
| | | | | | 1 | 718 | 718 | | | | | |
| | | | | | 1 | 741 | 741 | | | | | |
| | | | | | 1 | 744 | 744 | | | | | |
| | | | | | 1 | 726 | 726 | | | | | |
| | | | | | 1 | 727 | 727 | | | | | |
| | | | | | 1 | 711 | 711 | | | | | |
| | | | | | | | | | | | | |
| General Computer Lab | 1 | 850 | 850 | | 1 | 978 | 978 | | | | | |
| Planning Rooms | 2 | 400 | 800 | | 1 | 423 | 423 | | | | | |
| Physics Lab | 1 | 1,400 | 1,400 | | 1 | 1,273 | 1,273 | | | | | 1 |
| Chemistry Lab | 2 | 1,200 | 2,400 | | 1 | 1,371 | 1,371 | | | | | 2 |
| | | | | | 1 | 1,109 | 1,109 | | | | | |
| Biology/Life Science Labs | 4 | 1,200 | 4,800 | | 1 | 1,258 | 1,258 | | | | | 3 |
| | | | | | 1 | 917 | 917 | | | | | |
| | | | | | 1 | 943 | 943 | | | | | |
| Environmental Science Lab | 2 | 1,200 | 2,400 | | shared | w/Chem | | | | | | |
| Science Storage/Prep Rooms | 4 | 400 | 1,600 | | 1 | 975 | 975 | | | | | |
| Large Science Storage | 1 | 750 | 750 | | 1 | 402 | 402 | | | | | |
| | | | | | | | | | | | | |
| FOT Labs | 2 | 1,200 | 2,400 | | 1 | 1,255 | 1,255 | | | | | 1 |
| Shared Fab Area | | | | | | | | | | | | |

**COMPARATIVE PROGRAM STUDY**

| | | | | | ***Joppatowne High School*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ***Modernization*** | | | ***Addition*** | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| Engineering & Drafting Lab | 1 | 1,400 | 1,400 | | 1 | 1,862 | 1,862 | | | | | 1 |
| Project Storage | 1 | 400 | 400 | | 1 | 203 | 203 | | | | | |
| Bulk Storage | 1 | 400 | 400 | | 1 | 233 | 233 | | | | | |
| Communications/Video Studio | 1 | 1,700 | 1,700 | | | | | 1 | 1265 | 1,265 | | 1 |
| Computer Lab (CISCO Program) | | | | | 1 | 1,086 | 1,086 | | | | | 1 |
| Computer Equipment Lab | | | | | 1 | 377 | 377 | | | | | |
| | | | | 29,550 | | | | | | | 21,835 | |
| | | | | | | | | | | | | |
| **Foreign Language** | | | | | | | | | | | | |
| General Classrooms | 5 | 750 | 3,750 | | 1 | 1,125 | 1,125 | | | | | 3 |
| | | | | | 1 | 744 | 744 | | | | | |
| | | | | | 1 | 708 | 708 | | | | | |
| Seminar Room | 2 | 400 | 800 | | 1 | 345 | 345 | | | | | |
| Storage Room | 1 | 200 | 200 | | | | | | | | | |
| | | | | 4,750 | | | | | | | 2,922 | |
| | | | | | | | | | | | | |
| **Business Education** | | | | | | | | | | | | |
| Computer Labs | 3 | 1,000 | 3,000 | | 1 | 1,008 | 1,008 | | | | | 3 |
| | | | | | 1 | 961 | 961 | | | | | |
| | | | | | 1 | 1,014 | 1,014 | | | | | |
| | | | | | | | | | | | | |
| Storage Room | 1 | 200 | 200 | | | | | 1 | 196 | 196 | | |
| | | | | 3,200 | | | | | | | 3,179 | |
| | | | | | | | | | | | | |
| **Humanities & Fine Arts** | | | | | | | | | | | | |
| General Classrooms | 17 | 750 | 12,750 | | 1 | 743 | 743 | | | | | 15 |
| | | | | | 1 | 711 | 711 | | | | | |
| | | | | | 2 | 765 | 1,530 | | | | | |
| | | | | | 2 | 816 | 1,632 | | | | | |
| | | | | | 2 | 756 | 1,512 | | | | | |
| | | | | | 2 | 830 | 1,660 | | | | | |
| | | | | | 1 | 734 | 734 | | | | | |
| | | | | | 1 | 1,125 | 1,125 | | | | | |
| | | | | | 1 | 744 | 744 | | | | | |
| | | | | | 1 | 708 | 708 | | | | | |
| | | | | | 1 | 694 | 694 | | | | | |
| | | | | | | | | | | | | |
| General Computer Lab | 2 | 850 | 1,700 | | 1 | 1,125 | 1,125 | | | | | |
| Journalism Lab | 2 | 375 | 750 | | | | | | | | | |
| Seminar Rooms | 2 | 400 | 800 | | 2 | 426 | 852 | | | | | |

**COMPARATIVE PROGRAM STUDY**

| | | | | | ***Joppatowne High School*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ***Modernization*** | | | ***Addition*** | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| Planning Room | 3 | 400 | 1,200 | | 2 | 434 | 868 | | | | | |
| Storage Room | 1 | 400 | 400 | | 1 | 345 | 345 | | | | | |
| | | | | | 1 | 352 | 352 | | | | | |
| | | | | 17,600 | | | | | | | 15,335 | |
| | | | | | | | | | | | | |
| Art Studio | 2 | 1,200 | 2,400 | | 1 | 1,044 | 1,044 | | | | | 2 |
| | | | | | 1 | 1,172 | 1,172 | | | | | |
| Sculpture Studio | 1 | 900 | 900 | | 1 | 920 | 920 | | | | | 1 |
| Graphics Studio | 1 | 900 | 900 | | | | | | | | | |
| Graphics Lab | 1 | 450 | 450 | | 1 | 616 | 616 | | | | | |
| Art Storage | 2 | 400 | 800 | | 1 | 1,092 | 1,092 | | | | | |
| Kiln Room | 1 | 100 | 100 | | 1 | 100 | 100 | | | | | |
| Dark Room/Lab | | | | | 1 | 342 | 342 | | | | | |
| | | | | 5,550 | | | | | | | 5,286 | |
| | | | | | | | | | | | | |
| Instrumental Classroom | 1 | 2,100 | 2,100 | | 1 | 1,411 | 1,411 | | | | | 1 |
| Vocal Music Classroom | 1 | 1,400 | 1,400 | | 1 | 438 | 438 | | | | | 1 |
| Keyboard Lab | 1 | 750 | 750 | | 1 | 767 | 767 | | | | | 1 |
| Practice Rooms | 1 | 200 | 200 | | 1 | 200 | 200 | | | | | |
| Practice Rooms | 2 | 100 | 200 | | 2 | 100 | 200 | | | | | |
| Music Storage | 1 | 800 | 800 | | 1 | 579 | 579 | | | | | |
| Music Office | 1 | 240 | 240 | | 1 | 249 | 249 | | | | | |
| | | | | 5,690 | | | | | | | 3,844 | |
| | | | | | | | | | | | | |
| Black Box Studio/Drama | 1 | 1,750 | 1,750 | | 1 | 1,745 | 1,745 | | | | | 1 |
| Sound Control | 1 | 80 | 80 | 1,830 | 1 | 91 | 91 | | | | | |
| | | | | | | | | | | | | |
| General Foods Lab | 1 | 1,200 | 1,200 | | | | | 1 | 1391 | 1,391 | | 1 |
| Professional Foods Lab | 1 | 1,400 | 1,400 | | | | | 1 | 1609 | 1,609 | | 1 |
| Child Care Lab | 1 | 1,600 | 1,600 | | | | | 1 | 2224 | 2,224 | | 1 |
| FACS Storage/Laundry | 1 | 200 | 200 | | | | | 1 | 271 | 271 | | |
| FACS Office | 1 | 100 | 100 | | | | | 1 | 124 | 124 | | |
| FACS Classroom | | | | | | | | 1 | 753 | 753 | | 1 |
| FACS General Storage | | | | | | | | 1 | 263 | 263 | | |
| FACS Planning | | | | | | | | 1 | 546 | 546 | | |
| | | | | 4,500 | | | | | | | 9,017 | |
| | | | | | | | | | | | | |
| **Auditorium/Theater** | | | | | | | | | | | | |
| Auditorium | 1 | 5,400 | 5,400 | | 1 | 7,675 | 7,675 | | | | | |
| Balcony | 1 | 1,850 | 1,850 | | | | | | | | | |

**COMPARATIVE PROGRAM STUDY**

| | | | | | ***Joppatowne High School*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ***Modernization*** | | | ***Addition*** | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| Stage | 1 | 4,200 | 4,200 | | 1 | 2,450 | 2,450 | | | | | |
| Backstage Area | | incl | | | | | | | | | | |
| Ticket/Office | 1 | 500 | 500 | | 1 | 200 | 200 | | | | | |
| Control Room | 1 | 300 | 300 | | 1 | 300 | 300 | | | | | |
| Drama Storage/Set/Construction | 1 | 1,200 | 1,200 | | 1 | 1,243 | 1,243 | | | | | |
| Dressing Rooms | 2 | 400 | 800 | | 1 | 496 | 496 | | | | | |
| | | | | | 1 | 453 | 453 | | | | | |
| | | | | 14,250 | | | | | | | 12,817 | |
| | | | | | | | | | | | | |
| **Gymnasium** | | | | | | | | | | | | |
| Main Gym | 2 | 7,200 | 14,400 | | 1 | 8,987 | 8,987 | | | | | 1 |
| Aerobics | 1 | 2,400 | 2,400 | | 1 | 1,285 | 1,285 | | | | | 1 |
| Weight Room | 1 | 2,500 | 2,500 | | 1 | 1,958 | 1,958 | | | | | 1 |
| Concessions | 1 | 200 | 200 | | 1 | 150 | 150 | | | | | |
| Athletic Storage | 1 | 600 | 600 | | 1 | 1,603 | 1,603 | | | | | |
| Locker Rooms | 2 | 2,500 | 5,000 | | | | | | | | | |
| Team Rooms | 2 | 600 | 1,200 | | | | | | | | | |
| PE Offices | 2 | 200 | 400 | | 2 | 223 | 446 | | | | | |
| | | | | | 1 | 150 | 150 | | | | | |
| AD Office | 1 | 250 | 250 | | 1 | 250 | 250 | | | | | |
| Training Room | 1 | 200 | 200 | | 1 | 190 | 190 | | | | | |
| Drying | 1 | 200 | 200 | | | | | | | | | |
| PE Storage | 1 | 750 | 750 | | 1 | 1,153 | 1,153 | | | | | |
| PE Laundry | 1 | 100 | 100 | | 1 | 131 | 131 | | | | | |
| Auxiliary Gym | | | | | 1 | 6,000 | 6,000 | | | | | 1 |
| | | | | 28,200 | | | | | | | 22,303 | |
| | | | | | | | | | | | | |
| **Special Education** | | | | | | | | | | | | |
| LFI Classroom | 1 | 900 | 900 | | 1 | 874 | 874 | | | | | |
| Classroom | 1 | 750 | 750 | | 1 | 780 | 780 | | | | | |
| Seminar-SE | 1 | 400 | 400 | | | | | | | | | |
| Psychologist Office | 1 | 100 | 100 | | 1 | 144 | 144 | | | | | |
| Staff Planning Office | 7 | 60 | 420 | | 1 | 280 | 280 | | | | | |
| Storage Room | 1 | 200 | 200 | | 1 | 148 | 148 | | | | | |
| CSP Classroom Suite | | | | | | | | 1 | 939 | 939 | | |
| | | | | 2,770 | | | | | | | 3,165 | |
| | | | | | | | | | | | | |
| **Media Center** | | | | | | | | | | | | |
| Reading/Circulation | 1 | 5,240 | 5,240 | | 1 | 5,380 | 5,380 | | | | | |
| Reference (with computers) | 1 | 800 | 800 | | 1 | 807 | 807 | | | | | |

**COMPARATIVE PROGRAM STUDY**

| | | | | | ***Joppatowne High School*** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ***Modernization*** | | | ***Addition*** | | | | |
| **Room/Space** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **Number Each** | **Size (ea.)** | **Subtotal** | **Number Each** | **Size (ea.)** | **Subtotal** | **Total** | **No. Teaching Stations** |
| AV&Magazine Storage | 1 | 400 | 400 | | 1 | 227 | 227 | | | | | |
| CDC/File Server Room | 1 | 250 | 250 | | 1 | 270 | 270 | | | | | |
| File Server Room | | | | | | | | | | | | |
| Office/Production | 1 | 400 | 400 | | 1 | 756 | 756 | | | | | |
| | | | | | | | | | | | | |
| Casual Reading Area | 1 | 200 | 200 | | | | | | | | | |
| Project Rooms | 2 | 120 | 240 | | | | | 1 | 240 | 240 | | |
| Toilet | 1 | 40 | 40 | | | | | | | | | |
| | | | | 7,570 | | | | | | | 7,680 | |
| | | | | | | | | | | | | |
| **Homeland Security Magnet Program** | | | | | | | | | | | | |
| General Classroom | 3 | 750 | 2,250 | | | | | 1 | 753 | 753 | | 3 |
| | | | | | | | | 1 | 750 | 750 | | |
| | | | | | | | | 1 | 727 | 727 | | |
| H.S. Science Labs | 2 | 1,400 | 2,800 | | | | | 2 | 1520 | 3,040 | | 2 |
| Prep/Storage | 1 | 300 | 300 | | | | | 1 | 424 | 424 | | |
| Computer Labs | 2 | 900 | 1,800 | | | | | 1 | 905 | 905 | | |
| | | | | | | | | 1 | 892 | 892 | | |
| Law Enforcement (Courtroom) | 1 | 1,800 | 1,800 | | | | | 1 | 7957 | 7,957 | | 1 |
| Storage | 1 | 300 | 300 | | | | | 1 | 460 | 460 | | |
| Planning | 1 | 550 | 550 | | | | | 1 | 703 | 703 | | |
| Seminar | 2 | 490 | 980 | | | | | 1 | 995 | 995 | | |
| | | | | | | | | 1 | 483 | 483 | | |
| | | | | | | | | | | | | |
| Emergency Operations Center | 1 | 1,800 | 1,800 | | | | | 1 | 1871 | 1,871 | | |
| | | | | 12,580 | | | | | | | 19,960 | |
| | | | | | | | | | | | | |
| Net Area Total | | | 169,845 | 169,845 | | | | | | | 155,098 | |
| **Gross Area Total** | | 1 | | 253,069 | | | | | | | 238,090 | 66 |

# 7

# Code Issues

# CODE ISSUES

The following codes are currently applicable to this project:

| | |
|---|---|
| Building Codes: | 2006 International Building Code<br>Harford County Amendments Bill 08-03<br>2006 International Mechanical Code<br>2008 National Electric Code<br>Harford County Amendments Bill 06-04<br>2006 National Standard Plumbing Code and<br>2004 Supplement,<br>Harford County Amendments Bill 04-47<br>2006 International Fuel Gas Code |
| Fire Code: | 2006 NFPA 101 Life Safety Code |
| Accessibility Codes: | 1991 ADA Americans with Disabilities Act<br>1986 A117.1 ANSI Handicapped Code<br>Maryland Accessibility Code COMAR 05.02.02 |

The current building qualifies as a Type 2C non-combustible construction under the previous BOCA building codes. The corridor walls are constructed to the roof deck and the building is fully fire sprinklered. Specific exit capacity from each space has been reviewed and confirmed.

Below are Code Related aspects for the new construction and modernization portions of the project:

- With the new construction, the projects will be categorized as a Type 2B non-combustible construction.
- There will be a two-hour rated fire wall between some portions of the new and existing construction to meet allowable height and area requirements of the 2006 IBC.
- Overall exit capacity is more that adequate.

# 8

# Committee

# SCOPE STUDY COMMITTEE

| | |
|---|---|
| Macon Tucker | JHS Principal |
| Joseph Harbert | JHS Asst. Principal |
| Greg Komonder | JHS Asst. Principal |
| Leah Skica | JHS Homeland Security Program |
| Sue Garrett | HCPS Curriculum Supervisor |
| Frank Mezzanotte | HCPS Magnet Coordinator |
| Debbie Marx | PTA President, Magnolia Elementary School |
| Kathleen Sanner | Supervisor Planning and Construction, HCPS (Retired) |
| Ron Kauffman | Facility Planner, HCPS |
| Mohan Kohli | Project Manager, HCPS |

**Design Team**
(listed on following page)

# DESIGN TEAM CONSULTANTS

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(410) 290-9006

Michael Campbell, Principal in Charge

**CIVIL ENGINEER**

**G. W. STEPHENS JR. & ASSOCIATES, INC.**
4692 Millennium Drive, Suite 100
Belcamp, Maryland 21017
(410) 297-2340

Rowan Glidden, Principal

**STRUCTURAL ENGINEER**

**COLUMBIA ENGINEERS, INC.**
6470 Dobbin Road, Suite A
Columbia, Maryland 21045
(410) 992-9970

Rod Chacon, Principal in Charge

**MECHANICAL/ELECTRICAL ENGINEER**

**SPEARS VOTTA & ASSOCIATES, INC.**
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(410) 254-5800

Corey Colassard, Mechanical Project Manager
Gordon Bennett, Electrical Project Manager

**COST ESTIMATING**

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13600 Old Chatwood Place
Chantilly, Virginia 20151
(443) 573-4088

Stan Lewicki, Principal in Charge

# Appendix

# EXISTING SITE CONDITIONS
## CIVIL ENGINEERING REPORT – G. W. STEPHENS, JR. AND ASSOCIATES, INC.

### 1.1 SITE DESCRIPTION

The Joppatowne High School is located at 555 Joppa Farm Road in Joppa, Maryland. The site is located approximately one mile east of intersection of Pulaski Highway (Maryland Route 40) and Joppa Farm Road in southeastern Harford County. The school itself is situated on 64.6 acres+/- of land owned by the Harford County Board of Education (BOE). Maryland Real Property defines the site as Parcel 604 located on Tax Map 65 and is recorded among the land records of Harford County, Maryland in Liber 638 at Folio 105.

The property is bounded to the south by residential properties fronting along Joppa Farm Road, to the east by existing forest and the residential subdivision known as 'Joppa Woods', to the west by existing forested wetlands and the residential subdivision known as 'Lohrs Orchard', and to the north by residential properties and Trimble Road.

The property is currently improved with the high school building, paved driveways and parking areas, one athletic stadium with bleachers and oval track, five hard court play surfaces, two 60' softball diamonds, three 90' baseball diamonds, and 2-3 practice fields. The northern portion of the property along Trimble Road is covered by existing forest.

### 1.2 SITE CIRCULATION AND PARKING

The school property has two access points. The primary entrance at the southeastern property boundary is located at the intersection of Hinton Road and Joppa Farm Road and enters the school grounds between residential properties. This intersection is non-signalized. The secondary entrance is located at the southwestern boundary at the intersection of Hinton Road and Falconer Road. This intersection is also non-signalized. Bus traffic utilizes the primary entrance to access the site for student drop off and pick up. Buses will double stack and park along the primary entrance route and around the circle located in the front/center of the school building for student loading in the afternoons. During this time, automobile traffic is not permitted to utilize the primary entrance or the drop-off/pick up loop and is halted at the intersection of the secondary and primary entrance roads. After student pick up is completed, buses exit the property utilizing the primary entrance back to Joppa Farm Road. At this time, automobile traffic is released to utilize the primary entrance road and drop-off/pick up loop. This sharing of the internal circulation by buses and automobiles creates an inherent safety conflict between traffic and pedestrians. Currently accepted design standards for school circulation systems require that bus and automobile traffic be separated for pedestrian safety considerations.

Automobile traffic primarily utilizes the secondary entrance from Falconer Road to access the site. Approximately 54 parallel parking spaces are located along the entire length of the secondary entrance drive. The main student and faculty parking lot has approximately 190 parking spaces and 4 handicap accessible parking spaces. According to the current Americans with Disabilities Act Accessibility Guidelines (ADAAG), parking lots having a total of 200 to 300 parking spaces are required to have a minimum of seven handicap accessible spaces. Any proposed improvements to the parking area should address the current deficiency in providing sufficient numbers of accessible spaces.

## 1.3 ZONING INFORMATION

The school property is currently zoned R2, Urban Residential. The property is surrounded by varying densities of residentially zoned property. To the east and west, the property is bounded by R2 zoning, Urban Residential. To the north, the property is bounded by R1 zoning, Urban Residential. To the south, the property is bounded by R3 zoning, Urban Residential.

BULK ZONING REGULATIONS

Except as provided otherwise in this article, the following bulk regulations are applicable in an R-1 District for institutional uses.

| | |
|---|---|
| Minimum lot size | 2 acres |
| Maximum coverage by impervious area | 65% |
| Minimum width at front building restriction line | 100 feet |
| Minimum setbacks for principal structures: | |
| Front lot line | 50 feet |
| Rear lot line | 80 feet |
| Side lot lines | 40 feet |
| Corner side lot line | 50 feet |

## 1.4 SITE SOILS

According to information provided by the USDA Harford County Soils Survey, several soils exist on the property including:

En – Elkton series, moderate erodibility, severe building constraints
EvC – Evesboro series, moderate erodibility, moderate building constraints
LyB – Loamy and Clayey series, severe erodibility, severe building constraints
LyD – Loamy and Clayey series, severe erodibility, severe building constraints
LyE – Loamy and Clayey series, severe erodibility, severe building constraints
MiB – Mattapex series, moderate erodibility, moderate building constraints
Ot – Othello series, slight erodibility, severe building constraints
ShC2 –Sassafras series, moderate erodibility, slight building constraints
SsD – Sassafras/Joppa series, moderate erodibility, moderate building constraints
WoB – Woodstown series, moderate erodibility, moderate building constraints

## 1.5 SITE TOPOGRAPHY

The Joppatowne High School property is generally cut into topography that slopes from east to west across the site. The high school building, practice fields, and parking lots have been constructed on a series of graded plateaus. The high point is located near the center of the eastern property boundary with an elevation of 103' above sea level (ASL). The high point is adjacent to the Joppa Woods residential development. This area is the first in the series of graded plateaus that comprise the site. Two baseball diamonds and an open space area are located on this plateau. The western edge of this plateau is at approximately 70' ASL. From here, the topography slopes downward to form a large hillside to an elevation at approximately 40' ASL. This graded area forms the second plateau where the school building, athletic stadium, practice fields, hard court surfaces, and parking lots are located. The western edge of the second plateau is at approximately 30' ASL. From here, the topography slopes down again in the form of a smaller hillside to an elevation at approximately 25' ASL. This area forms the third and final plateau on the property where two baseball practice diamonds and a practice field are located. The western edge of this area is at approximately 20' ASL. From this point, the topography forms a small ridge with a high point of 23' ASL along the western property boundary adjacent to the Lohr's Orchard residential development. This small ridge drops off to a low point at approximately 14' ASL in the southwest corner of the property boundary.

## 1.6 STORM DRAINAGE AND STORM WATER MANAGEMENT

Currently, the High School building is guttered with leaders feeding into the existing storm drain system. The surrounding athletic fields and paved areas are drained with surface inlets which also feed into the existing storm drain system. In 2007/2008, the schools gymnasium was expanded and as a result of this expansion, a storm water management facility was constructed to handle the increase in runoff. This storm water facility was sized to handle future expansions in impervious areas being considered at that time. However, these proposed improvements have increased in size and may result in the need for additional storm water management facilities on the site. It is important to note that, in addition to the minimum standards and regulations imposed by Maryland Department of the Environment (MDE), Harford County has its own unique requirements

for storm water management. Generally, storm water management requirements vary with the type and magnitude of imperviousness. It is anticipated that both water quality treatment and water quantity control will be required to be addressed as part of the redevelopment of the school site.

## 1.7 UTILITIES

Water and sewer utilities currently serve the Joppatowne High School. An existing water main from both Falconer Road and Joppa Farm Road currently service the school. The existing water meters and service stubs may be removed and replaced in order to accommodate the newly designed school additions.

Currently, sewer services are provided from the existing sewer main located in Joppa Farm Road. This sewer main enters the site within Hinton Road and runs to the east to serve the Joppa Woods residential development along the eastern property boundary. It is expected that any new school construction will utilize the existing sewer route to service the property.

## 1.8 FLOODPLAINS, WETLANDS, AND WATERWAYS

The principal site is not within the 100-year floodplain as delineated on FEMA Mapping. See FEMA Map #24025C0261 D. The principle area of wetlands and waterways exists along the western property boundary. A small stream and associated wetlands runs north to south along this portion of the site. This area is contained within the 75' buffer of the Harford County Natural Resource District (NRD) and is not expected to be disturbed as part of the redevelopment activities on the site.

## 1.9 LANDSCAPE, TREES AND FOREST CONSERVATION

Landscaping within the developed area of the school property consists primarily of lawn and sporadic planting. There is approximately 21.0 acres+/- of existing forest located on the property. The forest is generally located along the northern, eastern, and western property boundaries.

The proposed improvements made to the school property will require adherence to the State of Maryland and Harford County forest conservation regulations. It is anticipated that the proposed additions may required limited forest clearing for storm water management purposes. This clearing would be for the storm water facility only and should not result in required reforestation plantings. If however reforestation plantings are required, there should various locations on the school property where they could be located. Adherence to state and local forest conservation regulations will be evaluated in detail once a final development strategy has been selected by HCPS.

## 1.10 PLAY STRUCTURES/ATHLETIC FIELDS/ATHLETIC COURTS

The school property has several areas of athletic fields, practice fields, and hard court surfaces. The following is a listing of the various elements provided at Joppatowne High School:

1. 3 – 90’ baseball diamonds
2. 2 – 60’ softball diamonds
3. 1 – athletic stadium with bleacher seating
4. 2 – multi-sport practice fields
5. 5 – paved tennis/basketball courts

The improvements that are proposed under this project should not impact any of the schools current athletic facilities.

# STRUCTURAL ASSESSMENT
**COLUMBIA ENGINEERING, INC.**

**Final Report**
**April 23, 2009**

The original construction documents for Joppatowne High School were prepared for the Harford County Board of Education and completed in November 1973. The design team included Fisher, Nes, Campbell, and Partners as the lead architect, and Van Rensselaer P. Saxe as the consulting structural engineer. The original building plans are divided into five separate areas, described below. This report maintains the same designations for establishing locations in the building.

In 2007, Columbia Engineering, Inc. prepared structural drawings for an auxiliary gymnasium addition. Construction for the expansion was completed in 2008.

## General Characteristics

Joppatowne High School is a steel framed structure with interior masonry partition walls, and exterior walls consisting of brick veneer with masonry backup. The slab on grade is typically 5" thick normal weight concrete with many shallow depressions for various floor finishes. Exterior masonry walls, interior masonry bearing walls, and interior masonry walls thicker than 8" are supported by continuous concrete footings. In general, interior non-bearing masonry partitions are supported on a thickened slab. Steel columns are supported by concrete spread footings.

Mechanical ductwork, plumbing lines, and other utilities are distributed throughout the building via shafts located below first floor corridors. These horizontal shafts terminate at a basement mechanical room in Area A, and at a boiler room in Area D. 12" thick concrete basement walls retain the soil surrounding these below grade areas. A 4 1/2" concrete slab over a 1 1/2" composite steel deck spans between basement walls to support the first floor corridors. Moisture tends to collect in sub-grade corridors, and over time, will corrode the deck and steel beams. CEI visually inspected the majority of these areas on 1/29/09, and did not find any significant signs of structural deterioration.

The roof structure throughout the building consists of 2" metal edge gypsum plank supported by steel beams.

No apparent lateral resisting elements are noted in the original structural documents; however, Columbia Engineering Inc. suspects that the interior and exterior masonry walls provide stability during wind and seismic events. Codes in use at the time of construction allowed engineers to design low-rise buildings with minimal lateral load considerations. Therefore, it is important to minimize modifications to both interior and exterior masonry walls. If the proposed renovations require removal of large portions of wall, an updated lateral analysis will have to be performed to ensure that the remaining wall will satisfy current code standards.

**Area A and Area B - Two-Story Classroom:**

The second floor consists of 3 1/2" lightweight concrete slab over 1 1/2" composite steel deck supported by steel beams. Please refer to the general characteristics described above for the rest of the structural elements in Area A and Area B.

**Area C - Administrative and Library:**
This is a one-story area with a mechanical basement located below the administrative offices. The area above the basement is a steel framed floor system with a 3 1/2" lightweight concrete slab over a 1 1/2"composite deck. A large skylight grid exists in the library roof, and may be modified or removed with minimal structural implications.

**Area D - Cafeteria and Auditorium:**
This is a one-story area with a boiler room located just below the kitchen. The boiler room has a 5" thick slab on grade, and is surrounded 16" thick concrete basement walls. The area above the boiler room is supported by a composite floor system consisting steel beams and a 3 1/2" lightweight concrete slab over a 1 1/2" composite deck. Shear studs welded to the top flange of each beam develop composite properties that strengthen the floor system. A large skylight grid exists in the cafeteria roof, and may be modified or removed with minimal structural implications.

The stage is constructed using an elevated slab on grade with a 6" thick concrete cantilever to form the front curvature. The adjacent instrumental rehearsal room has a stepped slab on grade supported at the rear of the room by the exterior masonry wall.

The auditorium's high roof is supported by several very large steel beams spanning approximately 96'-0". The exterior brick surrounding the high roof structure is supported on the low roof by structural steel.

**Area E – Gymnasium:**
The gymnasium is the only area of the building with a functional basement. Locker rooms, showers, storage, and offices are all located in the space directly below the gymnasium floor. The gymnasium is also the only area not designed using structural steel. The gymnasium floor consists of 10" deep hollow-core, pre-tensioned masonry plank supported on concrete and masonry bearing walls. The surrounding low roof areas were constructed using the typical steel beam and gypsum plank system found throughout the building.

A steel framed mechanical corridor with a 5" thick concrete slab exists just south of the gymnasium. The gymnasium high roof is similar to the auditorium roof in that large beams (plate girders) are used to span the entire distance across the room.

## Visual Inspection

CEI performed a visual inspection of Joppatowne High School on 12/29/08, and returned to review the condition of below grade areas on 1/29/09. The majority of the structural elements are not exposed, so CEI's visual inspection was limited to the exterior of the buildings, the

basement, and a few specific trouble areas. In general, it is CEI's opinion that the visible structural elements are in good condition and are functioning as originally intended.

There are several areas displaying signs of structural distress:

1. The slab in the dressing room areas behind the stage has settled approximately 1". The settlement problem in this area is likely a result of poorly compacted structural fill below the elevated slab on grade. Tall masonry partition walls located around the stage compound the problem because they are supported directly by the slab on grade. The original structural drawings include a typical thickened slab detail that applies under masonry walls, but CEI has no way to verify that the slab was properly thickened without exploratory demolition. Even if the slab was installed correctly, poorly compacted soil is still likely consolidate under a permanent, heavy load of this nature.

2. A vertical crack is present in both the east and west masonry wall of the auditorium. The crack starts at the slab on grade, and projects all the way to the top of the wall. CEI believes these cracks are related to the columns on line L (the cracks occur immediately adjacent to this column line). According to the plans, the columns on line L are blocked tight inside the masonry walls. Differential movement between the steel column and the masonry will propagate a crack in the wall. Incompatible coefficients of thermal expansion, and movement of the building frame under applied lateral load can both generate differential movement. The cracks do not appear to compromise the structural integrity of the wall. The cracks can be repaired, but as long as the column is enclosed in the wall, they will reappear over time.

3. The slab on grade is settling around the wall separating the serving area from the cafeteria. Similar to the settlement occurring around the auditorium stage, the masonry walls in the cafeteria are supported directly on the slab (no footing), and the proximity to the nearby basement wall indicates that the supporting soil may be poorly compacted fill.

4. Cracked terrazzo finish and slab settlement are visible in the lobby adjacent to the cafeteria. Again, poorly compacted soil around the basement walls is the most probable cause. In addition, cracks in the terrazzo exist in the framed corridor over the below grade mechanical tunnel. An investigation of this basement area revealed only minor surface rusting in the metal deck. It is CEI's opinion that the underlying structure is stable, and that the cracking in the terrazzo finish is not indicative of a structural weakness.

5. A large concentration of failing mortar joints occurs along the exterior brick wall in area D. CEI visually inspected several of these cracks, and found that the existing wire mesh wall reinforcement is rusting, expanding, and forcing the mortar to crack out of the position. This is evident because the cracked mortar joints occur at a uniform spacing of 16", which corresponds to typical reinforcement requirements. In some instances, the wire is now projecting away from the wall, and is visible from the ground. The contractor may have installed the reinforcement too close to exterior face of the brick, and the wall probably has minor water infiltration issues. Although CEI was unable to determine whether the wire is galvanized, even a galvanized finish cannot prevent some rust from developing over a 40-year period.

   The mortar joints can be repaired, but unless the moisture infiltration problem is addressed, the reinforcement will continue to rust and will again cause the mortar joints to crack.

6. Several of the exterior walkways appear to have settled over time. Specifically, the walkways around the southwest corner of the auditorium have settled approximately 1 1/2" to 2". Deep footings around the perimeter of the auditorium were probably backfilled with poorly compacted soil. The only way to address this settlement is to install new structural fill, compact it to proper requirements, and replace the walkway. A geotechnical engineer would be better equipped to quantify the required work for the exterior walkways.

   It appears that the walkways around the lobby entrance have been recently replaced with revised ramp and stair configurations. It is possible that the appearance of settlement in this area is actually a variation in grading from the original construction.

7. Overall, the structure in the below grade mechanical areas is in good condition. The concrete basement walls are free from cracks and spalls, the atmosphere is dry and well-ventilated, and the steel structure contains very limited corrosive damage. CEI noticed some minor surface rusting on the bottom of the metal deck in the air handling room, but it is not a significant structural concern. CEI was unable to examine the structure in the boiler room due to a drop gypsum/plaster fireproof barrier.

**Review of Original Structural Documents**

As part of the feasibility study, Columbia Engineering performed a cursory review of the structural systems shown in the Joppatowne High School documents, dated 11/25/69. CEI has the following comments:

1. **Roof Systems:**
   The structural drawings indicate that the roof is designed for a live load of 30 psf which meets all current code standards. However, code provisions for superimposed live loads due to drifting and sliding snow were not added until the 1990's. The International Building Code currently requires the design professional to consider leeward snow drifts that develop adjacent to changes in roof elevation, and windward snow drifts that develop against walls, mechanical units, and other large roof obstructions.

   Joppatowne High School has several changes in roof elevation where drifting snow will accumulate. CEI checked several of the structural members supporting drift areas, and determined that, in general, the roof members are capable of supporting IBC drifting snow requirements. Nevertheless, the location of new roof top mechanical equipment should be carefully considered to avoid costly structural reinforcement.

   All new roof penetrations should be supported with a steel angle frame attached to the existing roof members.

2. **Library and Kitchen:**
   The library and the kitchen are both located on the first floor, and subgrade mechanical rooms exist under portions of each room. The kitchen is supported above the boiler room by a composite slab system, and the library contains an elevated slab spanning over a mechanical corridor. The 1969 structural drawings indicate that the entire building is designed for a uniform live load of 100 psf. Current IBC requires a 150 psf live load for kitchens and libraries. Columbia Engineering reviewed some of the structural elements in these areas, and determined that they are capable of supporting the additional live load. A complete structural analysis of these areas will be required if they are subjected to future modifications or renovations.

3. **Second Floor Steel Floor Systems:**
   A cursory review of the second floor beams suggests that the floor is capable of supporting the advertised live load of 100 psf. This is more than adequate, as current code requires a uniform live load of 40 psf in classrooms, and 80 psf in corridors. Relocation of masonry walls should be kept to a minimum as this might require that sections of the framing be reinforced.

4. **Gymnasium:**
   The designation for the Strescon plank used in the gymnasium is 10+2, 88D8. This plank is a prestressed concrete design, meaning that cutting holes through this floor system could compromise the structure if not executed meticulously. The system consists of a 10” deep hollow-core concrete plank with a 2” topping slab, 2-#8 steel reinforcing bars, and (2)-1/2”dia. prestressing strands. Tables prepared by Strescon indicate that this floor is capable of supporting a 93 psf superimposed uniform load. This floor is not adequate when checked using current code standards; IBC 2006 requires gymnasium structure to support a uniform live load of 100 psf. The construction of the gymnasium does not lend itself to simple modification; alterations should be avoided if possible.

# I. EXISTING CONDITIONS

## A. Heating, Ventilation and Air Conditioning (HVAC)

The heating and cooling requirements for Joppatowne High School are served by an existing central heating and cooling plant located at the basement elevation at the west end of the building.

The central heating plant equipment consists of two (2) dual fuel (natural gas and #2 fuel oil) Cleaver Brooks boilers. Each boiler is rated for 10,480 MBH. The boilers produce low pressure (15 PSI) steam. Steam is supplied to a shell and tube heat exchanger for the generation of heating system hot water. Heating water system hot water distribution is accomplished via two (2) thirty (30) horsepower, Taco base mounted end suction pumps (in parallel) rated at 1,100 GPM each. These pumps and the associated hot water supply and return piping serve hot water heating coils in various pieces of air handling equipment located throughout the existing Joppatowne High School. The heating coils are equipped with three-way control valves.

The central cooling plant equipment consists of two (2) Trane centrifugal chillers, installed in 2006. The total chilled water plant capacity is five hundred (500) tons; as chiller CH-1 is rated at 300 tons and chiller CH-2 is rated at 200 tons. The centrifugal chillers are water cooled via an open loop condenser water system, which consists of two (2) Taco base mounted end suction condenser water pumps (in parallel) and an open cell cooling tower located at the exterior on grade. Two (2) Taco base mounted end suction chilled water pumps (in parallel) and associated chilled water supply and return piping provide chilled water distribution to cooling coils in various pieces of air handling equipment located throughout the existing Joppatowne High School. The cooling coils are equipped with three-way control valves. A refrigerant purge system, consisting of an inline fan, refrigerant sensors, ductwork and a wall louver, was installed at the time of the chiller replacement.

The existing chilled water system has the capacity of five hundred (500) tons. Based on the existing Joppatowne High School square footage, this results in an average of 42.5 BTU's per square foot. This falls into the low average range for cooling an educational building per American Society of Heating, Refrigerating, and Air conditioning Engineers (ASHRAE). This average BTU/square foot does not consider diversity.

In general, the existing central plant equipment, is in good condition. The existing Cleaver Brooks steam boilers have exceeded their expected service life of twenty five (25) years as defined by ASHRAE. There are other pieces of central plant heating equipment, including the shell and tube heat exchanger and hot water heating system circulation pumps, that have also exceeded their expected service life of twenty-four (24) and twenty (20) years respectively. All of this equipment appears to have been well maintained and, with continued care and maintenance, should provide some years of continued service at lower efficiency.

Four (4) chilled water variable air volume (VAV) central air handling units (AHU-1 through AHU-4), located at the basement elevation, provide conditioned air (49°F) to the majority of the existing Joppatowne High School, including classrooms, offices, etc. These units are building original (1971) and have exceeded their expected service life of twenty (20) years as defined by ASHRAE. Duct mounted fan powered hydronic terminal reheat units provide temperature control in various areas of the existing building.

Independent chilled water cooling/hot water heating HVAC units installed in 2008 serve various areas of the auxiliary gymnasium. Original (1971) hot water heating and ventilation units serve the existing main gymnasium, wrestling room and the locker room areas.

The Joppatowne High School is supplied with outside/ventilation air from various building air handling systems. The majority of the building's outside air is provided from the four (4) chilled water variable air volume (VAV) central air handling units (AHU-1 through AHU-4), located at the basement elevation. These systems, per the original design documents, provide 90,000 cfm of outside air via three (3) wall louvers located in recessed areaways. This outside air quantity significantly exceeds the ventilation air quantities required by current ASHRAE (62N-2004) and International Building Code (IBC) guidelines.

The high school is equipped with a minimal building automation system that is essentially limited to control/monitoring of central plant equipment. The system has been expanded under previous projects and has both pneumatic and digital components. Air handling units located throughout the building are not tied into a central system of monitoring or control.

B. Plumbing

The incoming domestic/fire water service to the building is located in the main mechanical room at the west end of the existing high school. The incoming water service is a six inch (6") service which serves both fire protection and domestic water loads.

Domestic hot water is created and stored in a four thousand (4,000) gallon domestic hot water storage tank with steam heating coil supplied by the central heating plant boilers. The domestic hot water generator was installed in 1971. This piece of equipment has exceeded their expected service life of twenty four (24) years as defined by ASHRAE.

Domestic hot and cold water piping originates in the mechanical room and is distributed throughout the existing high school to serve plumbing fixtures as required. An inline recirculation pump located in the basement mechanical space provides domestic hot water recirculation.

C. Fire Protection

The six inch (6") domestic/fire water service entering basement elevation mechanical room located at the west of the existing high school serves the wet pipe sprinkler system protecting the building. As noted during previous expansion projects at the Joppatowne High School, the existing fire protection service to the building is marginal due to the addition of an exterior fire hydrant under a separate project. Sprinkler system mains originate from the basement elevation mechanical room and serve sprinkler zone valves throughout the existing Joppatowne High School.

D. Electrical

1) Service and Distribution

The existing electrical service enters the building at the mezzanine level of the boiler room and consists of multiple sections of gear consisting of two (2) distribution sections, main breaker, and BGE CT compartment. The switchboard is rated at 277/480 volts, 3 phase, 4 wire, 3,000 amperes and is manufactured by Cutler Hammer. The existing distribution sections are out of breaker space. A fuse switch rated at 277/480 volt, 3 phase, 4 wire, 400 amp was tapped to the switchboard bus to serve the new gym addition. The current location and layout of the switchboard does not meet current code requirements with regards to work clearances and egress requirements.

2) Lighting

The existing lighting fixtures in the building consist of recessed 2' x 4' and 2' x 2' fluorescent fixtures with T8 lamps and magnetic ballasts. HID wall mounted brackets and surface mounted 1' x 4' fluorescent fixtures in utility areas. Lighting throughout the facility is inadequate and not energy efficient. Emergency lighting consist of battery powered units and exit signs with feeder circuits serving the emergency lighting from a disconnect switch ahead of the main breaker.

3) Fire Alarm System

The existing fire alarm system is a Firelite Simplex Sensiscan 2000 system monitored by Harford Alarm. The system was upgraded with a new fire alarm control panel when the auxiliary gym addition was constructed. The new fire alarm control panel is manufactured by Faraday, model MPC-6000. Firelite fire alarm system devices consist of manual pull stations, heat detectors, smoke detectors, duct detectors and audio/visual devices.

The existing fire alarm system does not meet current NFPA-70 or ADA code requirements. The only exception to this is the auxiliary gym addition which is served from the new Firelite control panel. The new Firelite control panel has

expandability to upgrade the current fire alarm devices in the remaining building to meet current code requirements.

4) Sound System
The existing Sound System is located in the general office area and consists of main sound system console with toggle switches for general voice paging/announcements throughout the building utilizing ceiling speakers.

5) Voice/Data System
The existing Voice/Data System Main Distribution Frame (MDF) is located in the Media Center with an Intermediate Fiber Frame located in the Found and Tech Computer Room. The MDF serves the majority of the cabling to the voice/data outlets located throughout the building. With the limited amount of voice/data closets, distribution is limited to ninety (90) meters or two hundred ninety (290) linear feet from the MDF location. Addition IDF closet space should be provided in the new classroom addition and relocated Main Office areas.

6) Security System
The existing security system is manufactured by Bosch and is located in the Maintenance Office. The existing security system is out of zones. The existing system consists of motion detector, door contact switches and electric sticks at the Main Entrance. The system is monitored by Harford Alarm.

## II. DEFICIENCIES

A. Heating, ventilation and air conditioning (HVAC) Ventilation and Air Conditioning (HVAC)

- The existing dual fuel Cleaver Brooks steam boilers are approximately thirty eight (38) years old. These boilers have exceeded their expected service life as defined by the American Society of Heating, Refrigerating, and Air conditioning Engineers. (ASHRAE).
- The existing hot water heating system equipment, including the shell and tube heat exchanger and various other components have exceeded their expected service life of twenty four (24) years as defined by ASHRAE.
- The main building air handling systems have exceeded their expected service life of twenty five (25) years as defined by ASHRAE.

B. Plumbing

- The existing hot water generator was installed in 1971 and has exceeded its expected service life of twenty four (24) years as defined by ASHRAE.

C. Fire Protection

- As noted in the previous section, the incoming fire water service size is marginal based on the addition of an exterior hydrant. The creation of more remote zones and subsequent increase in the fire protection requirements will require an upgrade to the incoming domestic/fire water service.

## III. RECOMMENDATIONS

A. Heating, ventilation and air conditioning (HVAC) Ventilation and Air Conditioning (HVAC)

Option B-1

- Replace the existing heating and ventilation systems currently serving the area designated for the Activity/Wrestling Rooms with heating/chilled water HVAC units. Connections to the chilled water and heating water system were provided for this installation under the Auxiliary Gymnasium project.
- Replace the existing heating and ventilation systems serving the area designated for the Tech Ed, Environmental Science, and Computer with heating/chilled water HVAC units.
- Provide new outside air ventilation and heat for the new electric room.
- Revise existing HVAC systems serving the existing areas to be renovated to match the new architectural layout. (TCHR Planning, Planning/Seminar, Project Room, Foreign Language, Math, Expanded Cafeteria, etc.)
- Replace major components associated with the existing chilled water VAV air handling units, including fans, motors, drives, and coils, to extend the service life of this equipment.
- Reduce the amount outside air provided to the building to current ASHRAE guideline and incorporate demand control ventilation.
- Perform an air balance of all building HVAC systems to ensure appropriate air volumes are provided to existing and new areas and that an adequate positive pressure is maintained throughout the building.
- The proposed building additions will result in an additional cooling load of roughly one hundred thirty (130) tons based on ASHRAE guidelines for typical occupancy and loads for classrooms, offices, common areas, etc. When considering diversity of occupancy, the existing chilled water plant does have sufficient capacity to serve these loads.
  Two (2) options for providing HVAC for the additional areas are possible:

  **Option 1**
  Provide local chilled/hot water variable air volume (VAV) HVAC units in the building additions (mechanical rooms or mezzanines) with medium pressure distribution and fan powered VAV terminal units with hydronic reheat coils. This option will require extension of the chilled water and heating water distribution

piping to serve the new systems. As the central plant equipment is located at the East end of the building and the additions are generally at the West end of the building, new distribution piping will need to be installed through significant portions of the existing school.

**Option 2**
Provide roof mounted direct expansion (DX) cooled/gas heated variable air volume (VAV) HVAC units to serve the building additions with medium pressure distribution and fan powered VAV terminal units with electric reheat coils. This option has a lower first cost than Option 1, as extension of the heating and chilled water system distribution piping is not required.

- All new equipment should be provided with direct digital controls and have the capacity to interface with the future building automation system (BAS).

B. Plumbing

- Provide a new combination fire/domestic water service sized for the revised fire and domestic water system requirements.
- Replace the existing domestic hot water generator with a new domestic hot water generator size for the revised domestic hot water loads of the building.
- Extend the existing domestic cold water, domestic hot water and sanitary piping systems to serve the new plumbing fixtures as indicated on the architectural plans. Please note that this will require extending larger piping mains to the West end of the facility as this is the farthest point from the incoming service. Work will be required in existing finished areas of the school.
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C. Fire Protection

- Upgrade the incoming domestic/fire water service to support the expanded wet pipe sprinkler system.
- Provide wet pipe sprinkler systems per NFPA requirements in the additional building areas.
- Revise the existing wet pipe sprinkler system as required to meet NFPA requirements for the revised architectural layouts.
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D. Electrical

1) Electric Service
A new electrical service room location with increased capacity to accommodate the new building additions. Backfeed existing switchboard from the new electric room switchboard.

The new switchboard shall be rated at 277/480 volts, 3 phase, 4 wire, 4,000 amperes. The new switchboard has sufficient spare circuit breaker and spaces to

accommodate the new building addition and phased construction of the existing school building to meet the new program spaces.

2) Lighting
Upgrade existing lighting fixtures with energy efficient compact fluorescent lighting fixtures and 2' x 4' recessed fluorescent fixtures with T8 and T5 lamps. Upgrade exit signs with LED lamps.

3) Sound System
With the Main Office area being relocated to the front entrance addition of the building, the main sound system console will need to be relocated to this area. This gives the school the opportunity to upgrade the existing system and replace the existing original ceiling speakers throughout the building.

4) Voice /Data
The current location of the Main Distribution Frame is unaffected by the construction; however, the existing cabling system that emanates from the MDF to the renovated areas will have to be removed and replaced. Based on the limited number of IDF's or intermediate distribution closets, we recommend that an additional IDF closet location be provided in both the new classroom addition and the area of the new main office area to provide for better flexibility in the cabling system and to limit the rooms of CADD 5 E-Cabling from the IDF closets to the various renovated areas.

5) Security System
Based on the condition of the existing security system and the proposed renovation it is recommended to replace the existing Bosch security system with a system with additional zones to accommodate the new building additions and to expand the existing building zoning.

We recommend that a new Bosch 4412G Control/Communicator panel be installed with a remote command center keypad, an independent command center keypad, door contact switches, motion detectors, and alarm sirens to accommodate the new and existing building layout.

- End of Report -