Broughal Middle School
Options for renovation or new construction
A report by Yale Stenzler and David Anstrand
Educational Facilities Planners
April 4, 2005

Introduction

Broughal Middle School is located in southwestern Bethlehem adjacent to the main campus of Lehigh University.

About 90 percent of Broughal's 630 students live within walking distance of the school. About 75 percent receive free and reduced lunch. Broughal has consistently met all the standards in the annual Pennsylvania System of School Assessment tests.

The school was built in 1916 with an addition constructed in 1961. The building was renovated in 1976. The total building area is 125,800 square feet, according to the drawings provided to us, and is located on a site covering just over four acres. Based upon floor plans provided and discussions with the district's engineer, it appears about 11,100 gross square feet (in the basement area) are not assignable space and should not be included in the gross square footage for this building. Therefore, 114,700 square feet are being considered as the existing square footage in this report. The school is the oldest in the district that has not been touched in the past 25-30 years.

Background

The school district has been studying various options for capital improvements involving Broughal Middle School for many years. Three options are:

1. Renovate and add to the existing school
2. Build a new school on the same site
3. Build a new school on another site.

The school district's attempts to find another suitable site in South Bethlehem have been unsuccessful. The most recent alternative site being considered is the Mountaintop Campus of Lehigh University. The proposed school site is approximately 10 acres that includes part of the former Homer Research Laboratory.

Prompted by newspaper reports of the possible decision to replace Broughal with a new school to which all students would be bused, Thomas Hylton, author of *Save Our Land, Save Our Towns*, approached the school board and offered the services of two expert consultants to study the situation and make a report to the school board at no cost to the district. The school board accepted the proposal.

The consultants are:

Dr. Yale Stenzler. Stenzler has a doctorate in education from Columbia University. He retired in January 2003 after 21 years as director of Maryland's School Construction Program, where he reviewed and approved scores of school construction projects totaling hundreds of millions of dollars. He is an active advisor to the Council of Educational Facilities Planners International.

David Anstrand. Anstrand has master's degrees in architecture and city planning from the University of Pennsylvania. He retired in August 2004 as construction administrator and director of facilities for the Manheim Township School District in Lancaster County. He oversaw the renovation of four elementary schools as energy efficient "green" buildings. He is on the board of the Council of Educational Facilities Planners International, as representative of the northeast United States.

On March 23, 2005, Hylton, Anstrand and Stenzler met with Dr. Joseph A. Lewis, members of his staff, and Arif Fazil of D'Huy Engineering, the district's consultant. They also visited and toured Broughal Middle School with Lisa Lynch, the vice-principal, Fazil, and Jack Wittenberger of the school district's facilities department. The consultants also drove through the Broughal attendance area, past several other public schools in the district, and the proposed alternative site on the Lehigh Mountaintop Campus.

Findings and Recommendations

Option 1 – Renovate the existing school and construct an addition

We recommend the district should commission a detailed feasibility study to investigate the renovation of the existing Broughal Middle School with an addition to support a student enrollment of 650-675 students in grades 6-8. The existing building with about 114,700 square feet and an addition of 10,000 square feet next to the gymnasium seems the most appropriate course of action given the building configuration and site constraints.

Our reasoning is as follows:

1. Although our proposal is below the 800-900 student capacity proposed by the district, we believe a smaller school will provide a better educational environment, considering the socio-economic status of Broughal's student body. Considerable educational research indicates students from low income families do better in smaller schools, and Broughal's test scores seem to bear this out.

   Based upon our experience, a review of the materials gathered, and our discussions with district personnel, we feel the addition and renovation proposed would be the most cost-effective use of the district's resources.

2. The cost estimate for this recommended option is $14,060,500. This is based upon hard costs only (construction and site redevelopment) as follows:

   Renovation of approximately 107,800 sq. ft. at $105.00 per square foot

Upgrading the gymnasium of approximately 6,900 sq. ft. at $35.00 per square foot

An addition of 10,000 square feet at $150.00 per square foot.

3. The detailed list of recommendations for improvements at Broughal from the district's Master Plan document dated November 1, 2004, which totals $9,513,840, would all be accomplished in the proposed renovation/addition project. The district report suggests asbestos abatement work would be required at an estimated cost of $2.5 million, which seems high, based upon our understanding of the situation and our experience. Besides addressing these deficiencies and the asbestos work, the facility would be completely renovated to meet the educational requirements for a 21st century school.

   Our estimate of a total cost of $14,060,500 includes $1,000,000 for asbestos abatement.

4. In comparison, a new school for the same student enrollment (650-675) might require approximately 118,000 sq. ft. (multiplied by $150.00 per square foot) and cost $17,700,000.

5. If the renovation/addition project is delayed until the Liberty High School renovation/addition project is completed, Broughal students could be shifted to the existing Northeast Middle School before it is demolished. This may delay the project for three years. However, it would take at least a year for an architectural/engineering firm to develop the plans and specifications, receive approval from the Pennsylvania Department of Education, advertise for bids, award the contracts, and obtain building permits before any actual work at Broughal could commence.

   Another option to house students would be to seek an alternative non-educational space for the interim period, which would require additional expenditure for rent and/or temporary improvements to meet the school's needs. In the summer of 2001, for example, the City of Lancaster School District was able to find year-long accommodations for 750 students in local office buildings on short notice when the McCaskey East High School was closed for a year for emergency repairs.

6. The feasibility study should also include consideration of the following:
   1. The feasibility of enclosing and utilizing (capturing) the open space on the fifth floor above the auditorium ceiling.

   2. The feasibility of adding a floor within the existing gymnasium (as was accomplished in the previous renovation of Broughal) and build a new gymnasium.

   3. Shift the existing food service program from the second floor location to the lower level in the gymnasium (as suggested above).

   4. Relocate the library to a more prominent and functional location.

5. Relocate the administration area to a more functional location.

7. Retaining the existing school avoids significant busing costs associated with the possible relocation of the school to the Lehigh Mountaintop Campus. There are additional costs for acquiring additional buses ($780,000) and the increased annual costs for the operation of the vehicles ($240,000). The information we have (memo dated Dec. 24, 2004) does not mention the cost for maintaining the vehicles, which may or may not be included in the operational costs.

8. Renovating Broughal will be far more environmentally sound than constructing a new building. Keeping Broughal will avoid massive demolition and the construction of a new building structure. This will save the district the expense associated with foundations, structural steel, floors, walls, staircases, window and door openings, the roof, and most interior walls. Energy will be saved by not having to manufacture, transport, and install these elements and products. The environment is protected when less energy is expended for a project and when less material is shipped to landfills.

9. More jobs will be created per tax dollar expended in a renovation project than new construction.

10. Almost all of the students currently walk to Broughal. The current enrollment of 630 could grow into the proposed 650-675 school building. Walking to school contributes to the health of individual students and the vitality of the community.

11. Students now have access to after-school programs and can walk home and/or take late buses. This provides significant opportunities for strengthening ties with current and former students and their parents. This school can be the "place to be" for positive educational, recreational, cultural, and social activities and experiences for the youth of the community.

12. Use of this school by the community might be expanded with park and recreation programs for current students (grades 6-8), former students (grades 9-12), and students in the elementary schools (grades 1-5) by setting aside days and/or times for these groups and programs.

13. Broughal's unique and exquisite auditorium (which is unlikely to be replicated in new construction) can meet a wide range of educational and community needs.

14. We recognize that about 200 students from the original proposal (800-900 students) would have to be accommodated in another middle school in the district. Based upon the information provided and the description of where new growth is occurring (which is outside of the original South Bethlehem neighborhood) it appears that other existing middle schools or a new middle school in closer proximity to growth areas would be a better choice for them.

Option 2 - Rebuild a new middle school on the same site

Construction of a new middle school on the existing Broughal Middle School site to accommodate 675-900 students would minimize busing and provide the benefits of a neighborhood school as listed above.

However, this option would eliminate a community landmark and cost more than renovating and adding to the existing Broughal Middle School.

Moreover, the Pennsylvania Department of Education instructs school districts to take all reasonable efforts to preserve and protect school buildings that are eligible for the National Register of Historic Places. We understand that Broughal is or soon will be declared eligible for the National Register by the Pennsylvania Bureau for Historic Preservation.

Option 3 – Building a new school on a site at the Lehigh Mountaintop Campus

We believe this option has negative social, environmental, and economic impacts, as follows:

1. By relocating the school to South Mountain, the school is separated from the South Bethlehem community. Although the distance may not be significant in terms of mileage, the reality is a new school would not be nearly as accessible as Broughal is today.

2. All students attending this school would have to be bused. There would be significant economic and environmental costs for added busing. On the other hand, walking is good for the health of the students and the vitality of the community.

3. After-school activities at the new school on South Mountain would require either additional buses and/or parent transportation with private vehicles.

4. There would be a significant increase in traffic on the roads to the South Mountain site during the morning student and teacher arrivals and afternoon dismissals. This includes both school buses and private vehicles, with teachers, administrators, school staff, and parents dropping off or picking up their children.

5. Parental and extended family participation in the life of the school, especially for low income families, will be far more difficult.

6. With the presumed sale of the existing Broughal Middle School and site to Lehigh University and the possible demolition of the existing Broughal Middle School, a community landmark will disappear.

7. Prior to a decision by the school board to proceed with this option there should be detailed environmental studies prepared related to the existing Homer Research Laboratory building and the site around this building.

8. The district should review and study the response time for emergency services to reach the South Mountain site compared to the existing site in South Bethlehem. This

should include responding to an event that would require police, fire, and/or ambulance services.

Sample floor plan of a renovated and enlarged Broughal Middle School

The following pages show one way Broughal Middle School might be renovated and enlarged to provide a 21st century educational program and accommodate 650 to 675 students.

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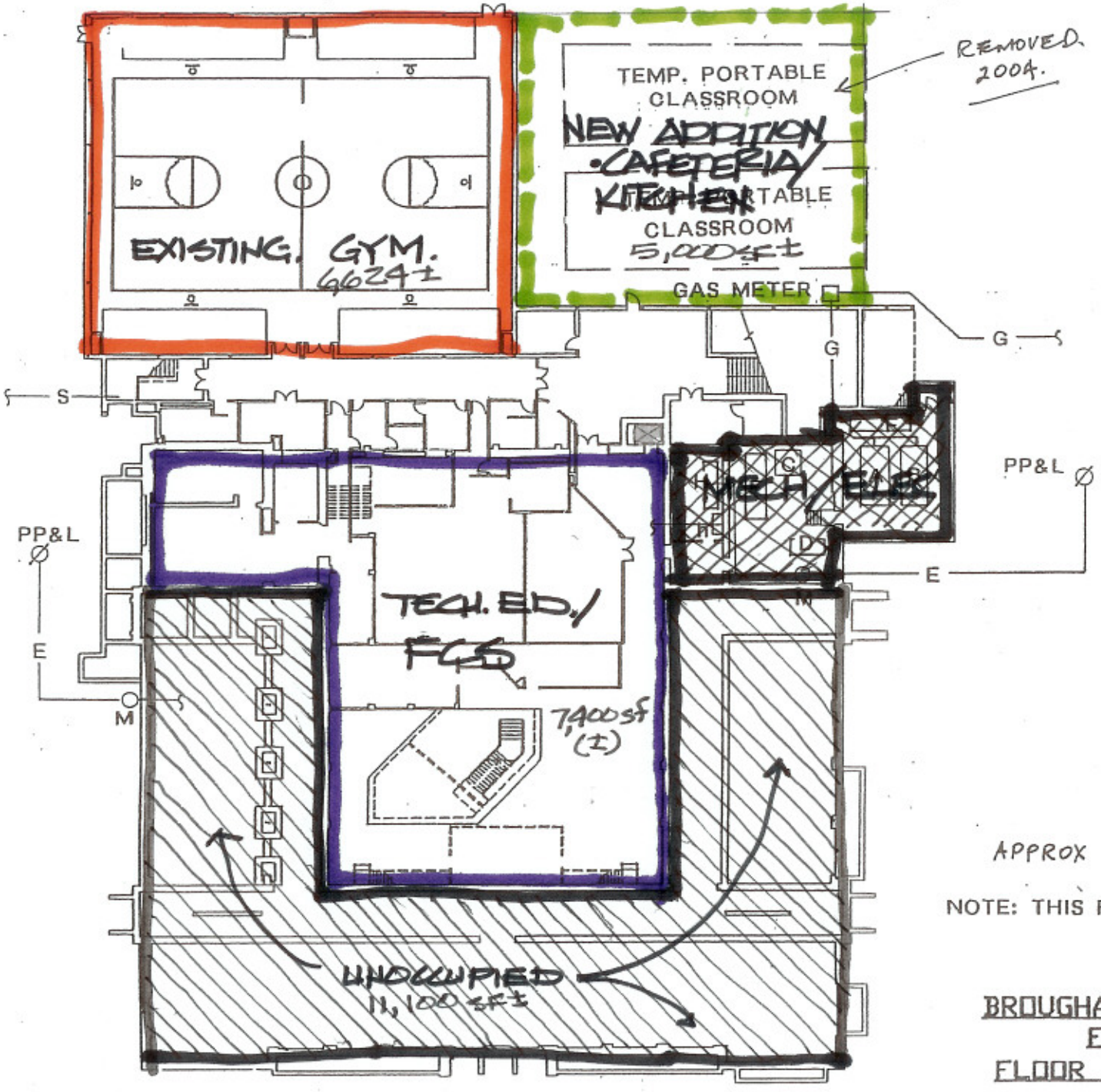


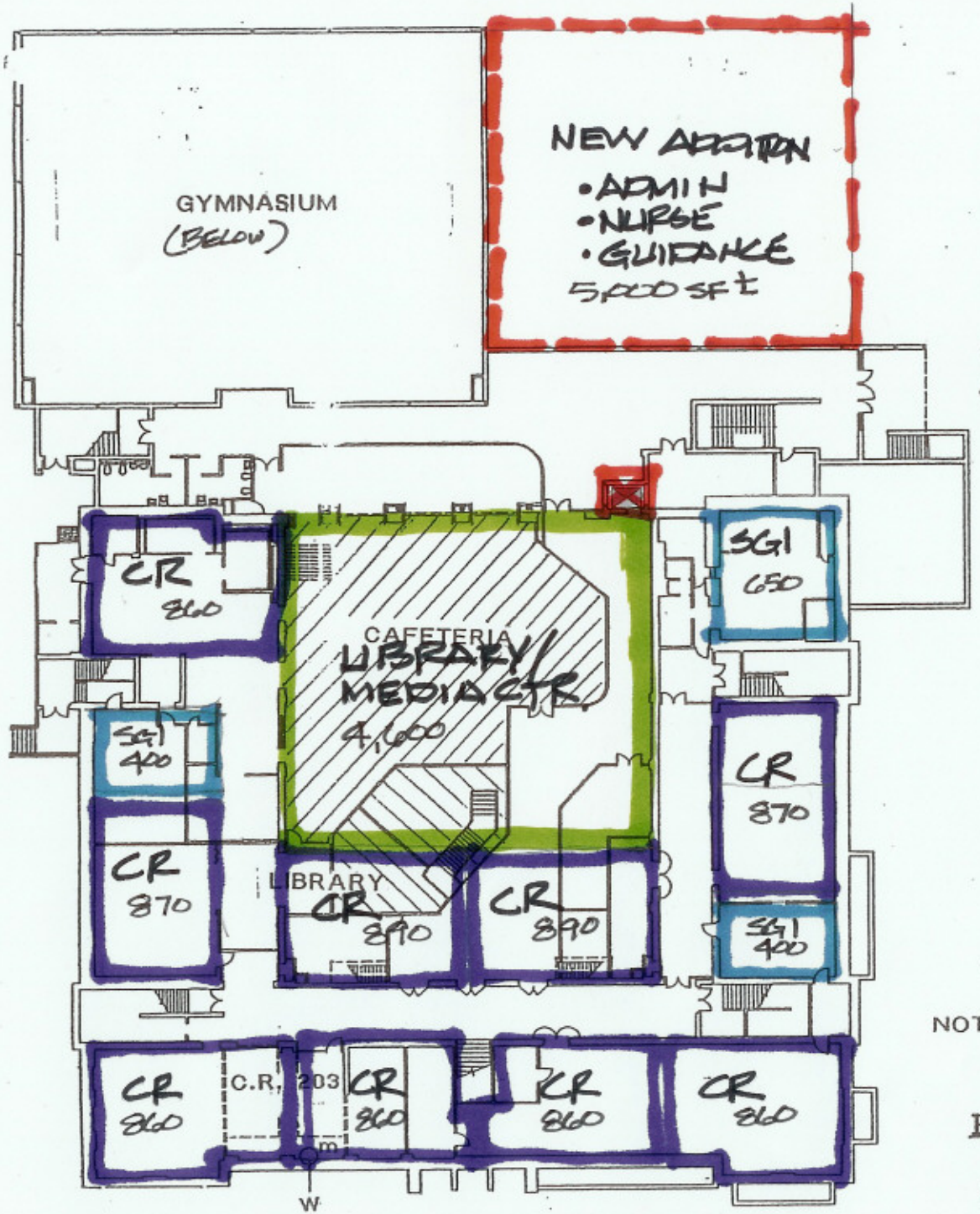
LEGEND

A - BOILER NO.1
B - BOILER NO.2
C - BOILER NO.3
D - EMER.GENERATOR
E - ELECTRIC SERVICE
F - HOT WTR.HLDG. TANK
G - GAS SERVICE
H - PRIMARY ELEC. SERVICE
M - ELECTRIC METER
S - SANITARY
h - SECONDARY ELEC. SERVIC

APPROX 36,000 SQ.FT (INCL. GYM.)

NOTE: THIS FLOOR HAS FIRE SPRINKLERS

BROUGHAL MIDDLE SCHOOL
FIRST FLOOR
FLOOR PLAN SCHEMATIC



N

BLDG. NORTH

FUNCTIONAL ENTRANCE

LEGEND

W - WATER LINE

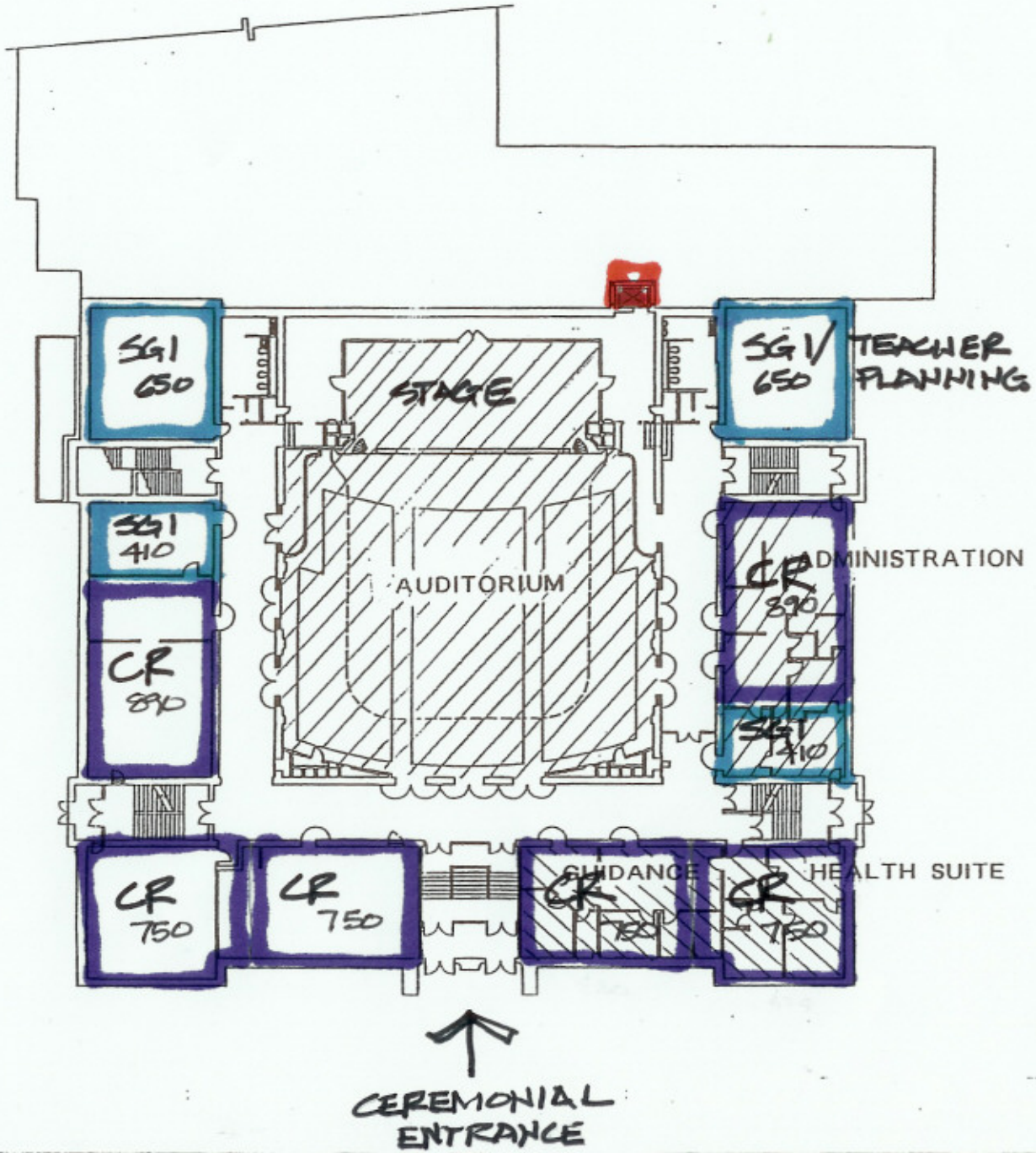
m - WATER METER

AIR CONDITIONED

APPROX. 30,000 SQ. FT.

NOTE: THIS FLOOR HAS FIRE SPRINKLERS

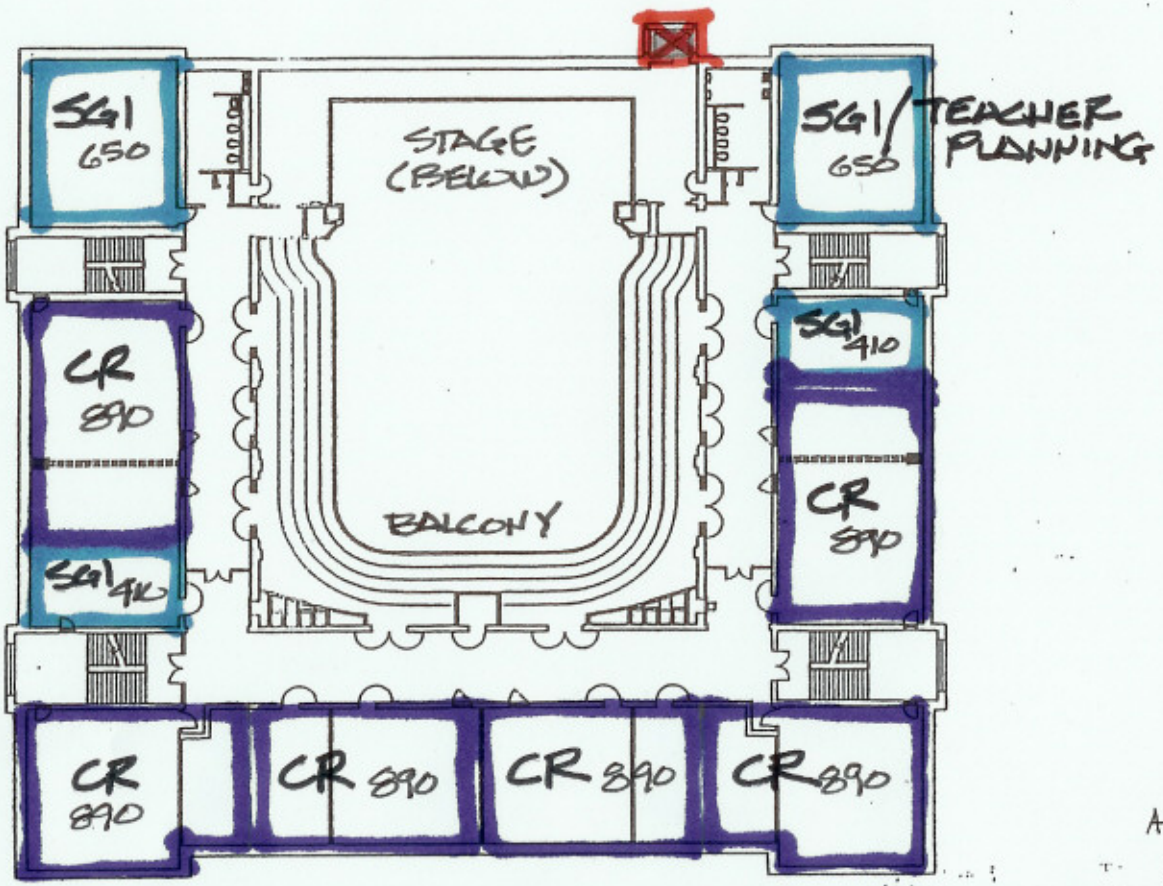
BROUGHAL MIDDLE SCHOOL
SECOND FLOOR
FLOOR PLAN SCHEMATIC



23,000 SQ. FT

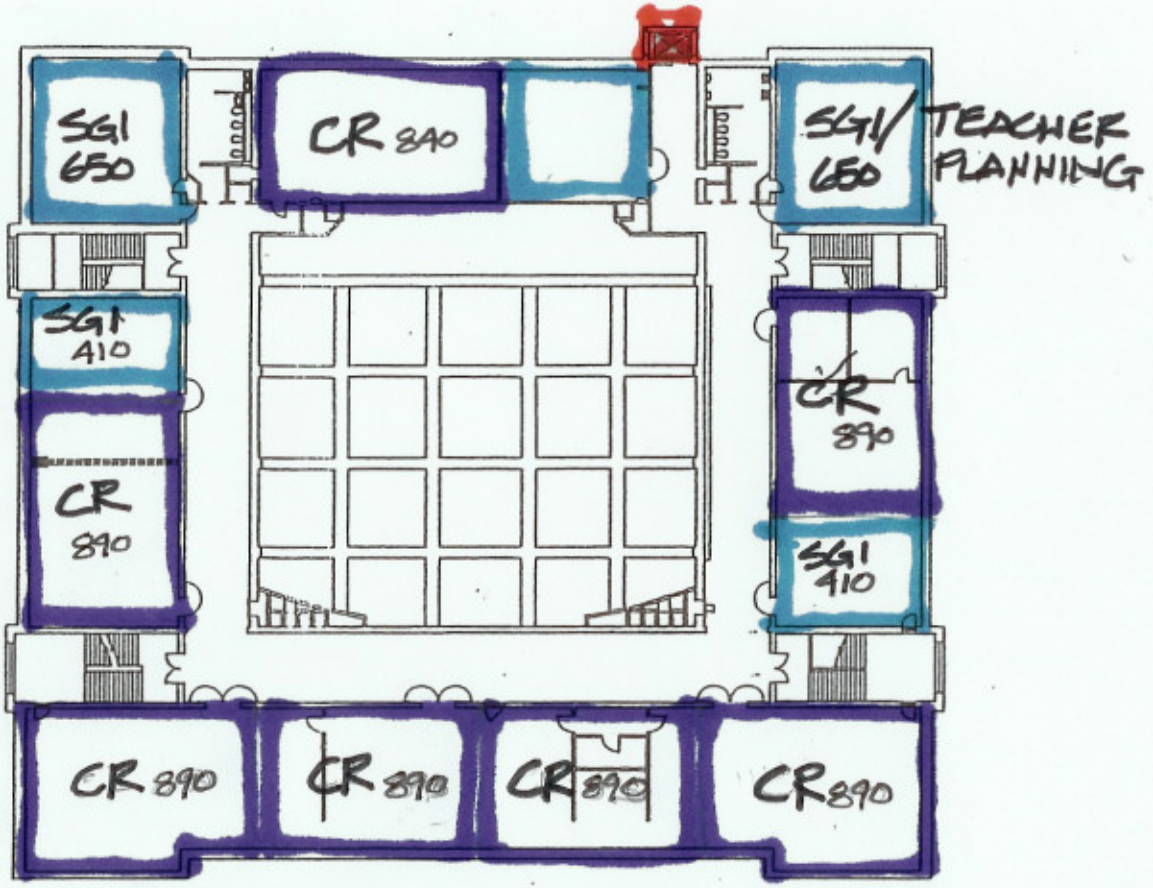
BROUGHAL MIDDLE SCHOOL
THIRD FLOOR
FLOOR PLAN SCHEMATIC

BLDG. NORTH



APPROX 20,000 SQ.FT

BROUGHAL MIDDLE SCHOOL
FOURTH FLOOR
FLOOR PLAN SCHEMATIC



BLDG. NORTH

Approx. 19,000 SQ.FT

BROUGHAL MIDDLE SCHOOL
FIFTH FLOOR
FLOOR PLAN SCHEMATIC