

ENERGY PROGRAM FOR A SCHOOL OF DEMOCRATIC PRACTICE

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December 4, 2007**

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Abstract:

A republic bereft of concerned citizens quickly degenerates into an oligarchy. Modern pedagogy instills apathy towards government rather than a desire to participate, facilitating this trend.

A new educational paradigm is required, and it will not fit graciously within a standard school design. Schools are run in an authoritarian fashion while democratic ideals are espoused in mainstream discourse. From an early age students learn that authority cannot be engaged or reasoned with, only obeyed or avoided. Ira Shor, a professor at City University of New York who writes frequently on the need to reevaluate this facet of education, highlights the paradox: “One morning, [the principal] called me to his office to let me know he was banning the little school newspaper I had started with my best friend Barry. (We called it "The Spirit of '93" to play on "the spirit of '76" we had read about vis a vis the American Revolution, and to honor our public school that had a number but no name.) When the principal abruptly ended our literate venture, I learned that 11-year-olds in our democracy can't publish a paper without prior official approval.”

Knowledge, the ostensible reason for the school's existence, is imparted in the manner of an assembly line, alienating its recipients and teachers alike. When students leave and go about their 'real' lives, the curriculum is of little relevance and quickly forgotten. Specific knowledge is prone to decay; instead schools should seek to instill the values and habits vital to critical thinking and a participatory system of government. This must be done through practice. It is not enough to teach democratic principles, schools themselves must become microcosms of democracy where students learn that communal decision making and discussion is the only valid means of resolving conflict and choosing direction. Student government should not be a farce, whose primary responsibility is to determine whether the next dance will have a nautical, heavenly, or tropical flavor. Curriculum, process, and educational values must be decided *with*, not *for*, the student body. Only in this manner can an engaged citizenry be created through public initiative.

What This Means for the Physical School:

Instead of the auditorium, designed for one way transfer of information from the authority-controlled stage to the captive student body, a popular assembly room becomes the new heart of a school. There representatives of teachers, parents, and students meet to decide how and what their school ought to be. The classroom mirrors this development, with altogether less emphasis on formal instruction. Students choose what they wish to learn about and who will teach them. Instead of the

classroom as a discrete unit with a fixed population and coursework, it becomes one ever-changing community of learning within a larger framework of knowledge.

Energy Implications:

Low energy consumption, as with democracy, is best taught by example, so sustainability becomes a way of being rather than an ideal. Since housing stock is resistant to change, school will be where children learn the benefits of such efficiency. An incentive program based on waste production and utility consumption would be a good start, with the students endorsement of course.

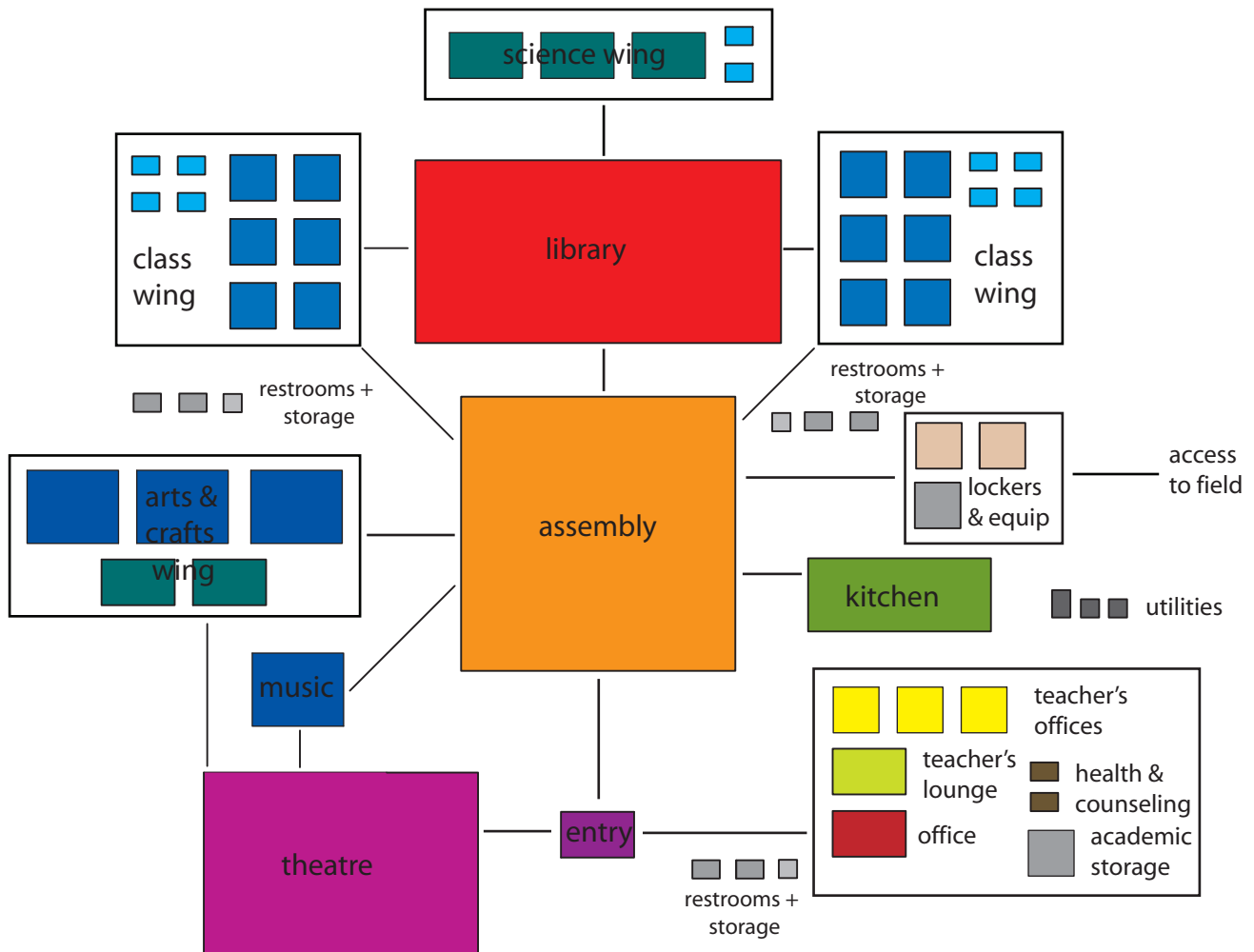
For other learning to transpire proper environmental conditions are a necessity. This means relatively high levels of daylight and acoustical isolation. Air quality should be provided through natural ventilation whenever possible. Other elements of a school program suggest more environmental insulation – the numerous service areas and theatre most notably.

Some basic strategies:

- Maximizing heating from solar gain in winter through proper placement of thermal mass and glazing.
- Minimizing heat gain during summer with operable and vegetative shading.
- Water to be heated using solar energy.
- Runoff to be retained on site with system of bioswails. Compact building footprint and use of permeable paving materials will facilitate this further.
- Use of photovoltaics as cost-effective given total amount of solar radiation in region.
- The school should be zoned to accommodate reduced energy use during after-school period when only parts of the school are in use.
- Classrooms stacked and arrayed around the perimeter of larger interior volumes. An idiosyncratic perimeter or series of courts could provide multiple air and light exposures to each. Striking the right balance between density for the sake of insulation and dispersion for the sake of environmental amenity will be key to assuring both low energy use and pleasant atmosphere.
- Cross ventilation through system of transom windows feeding corridors if multiple air exposures cannot be attained.
- Well sealed building envelope with minimal northern exposure, double glazing and high-R value insulation.
- Garden for consumption, children to prepare own meals. Children to clean school in cooperation with teaching staff. These two measures should reduce labor consumption significantly.

Space	Quan.	Dimensions	Lighting	Ambient	Task	Ventilation	Occupant Load	Schedule	Summer Use
			Nat/iso			Nat/Cond	Density	Duration	Daily
Entry	1	25x40x12	N	H		N	H	S	12 hr
Assembly	1	150x150x36	N/I	H		N/C	H	L	12 hr
Library	1	200x100x36	N/I	H	x	C	L	L	12 hr
Theatre	1	50x100x36	I	L	x	C	H	L	12 hr
Lockers	2	25x25x12	N	L		N/C	H	S	12 hr
Restrooms	6	10x15x12	N	L		N/C	L	S	12 hr
Storage – Athletic	1	25x25x12	I	L		C	L	S	12 hr
Kitchen	1	40x100x12	N	H		N/C	H	L	8 hr
Counseling	1	10x15x12	N	L		N/C	L	L	8 hr
Facilities Admin Office	1	25x40x12	N	L	x	N/C	L	L	8 hr
Teacher's Lounge	1	25x40x12	N	L		N/C	H	L	8 hr
Health Office	1	10x15x12	N	H		N/C	L	L	8 hr
Storage – Facilities	3	10x10x12	I	L		C	L	S	8 hr
Teacher's Offices	3	25x25x12	N	L	x	N/C	L	L	8/12 hr
CR – Multipurpose	12	25x25x12	N/I	H	x	N/C	H	L	8/12 hr
CR – Science	3	25x40x12	N/I	H	x	N/C	H	L	8/12 hr
CR – Art & Design	2	25x40x15	N/I	H	x	N/C	H	L	8/12 hr
CR – Crafts	3	40x50x15	N	H	x	N/C	H	L	8/12 hr
CR – Music	1	40x50x12	N	H	x	N/C	H	L	8/12 hr
CR – Small Meeting	10	15x10x12	N/I	L		N/C	H	L	8/12 hr
Storage – Academic	1	25x25x12	I	L	x	C	L	S	8/12 hr
Utilities – Electric	1	10x10x12	I	L		C	L	S	24 hr
Utilities – HVAC	1	10x15x12	I	L		C	L	S	24 hr
Utilities – Water	1	10x10x12	I	L		C	L	S	24 hr

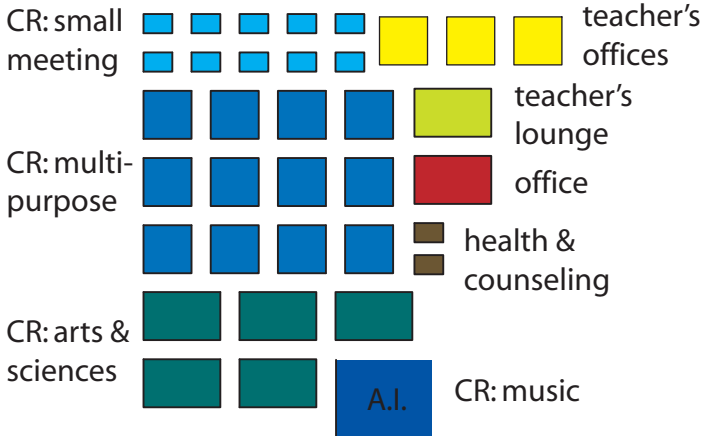
Figure 1 - Spaces Grouped According to Programmatic Needs



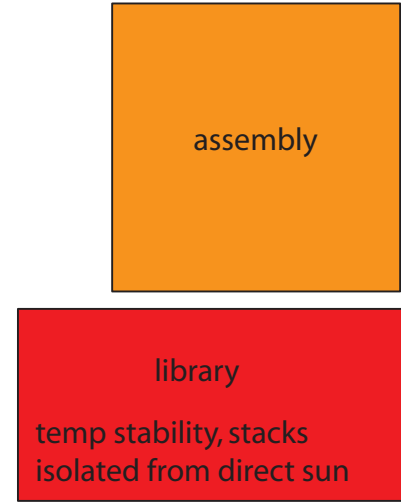
Assumptions: This scheme utilizes the assembly space as a central social and circulatory commons. It doubles as a dining area. The library links academic spaces, feeding ultimately into the assembly. These spaces are arranged into a series of wings according to general subject matter. Crafts, music, and the theatre are grouped for ease of collaboration on theatrical productions. An administration block flanks the entry, controlling access.

Figure 4 - Spaces Grouped According to Schedule

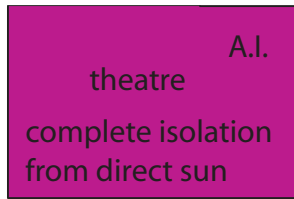
Group 1- Day / High Ambient / Task Lighting
Natural + Low Capacity HVAC



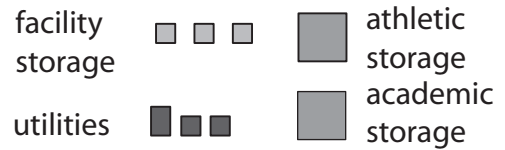
Group 4- Day / Low Ambient / Task Lighting
Natural + High Capacity HVAC



Group 2- Low Ambient / Stage Lighting
High Capacity HVAC



Group 5- Low Ambient
Low Capacity HVAC



Group 3- Day / High Ambient / Task Lighting
Natural + High Capacity HVAC

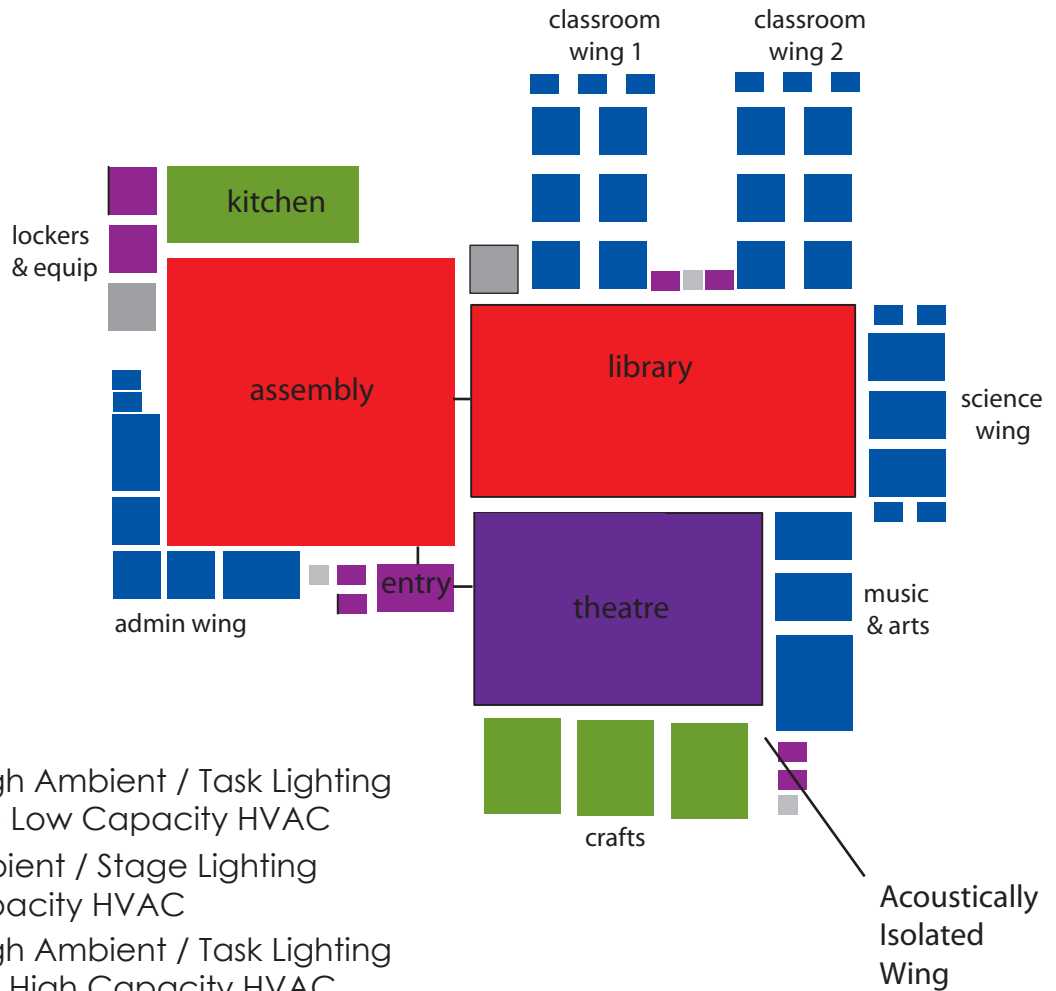


Group 6- Day / Low Ambient
Natural + Low Capacity HVAC



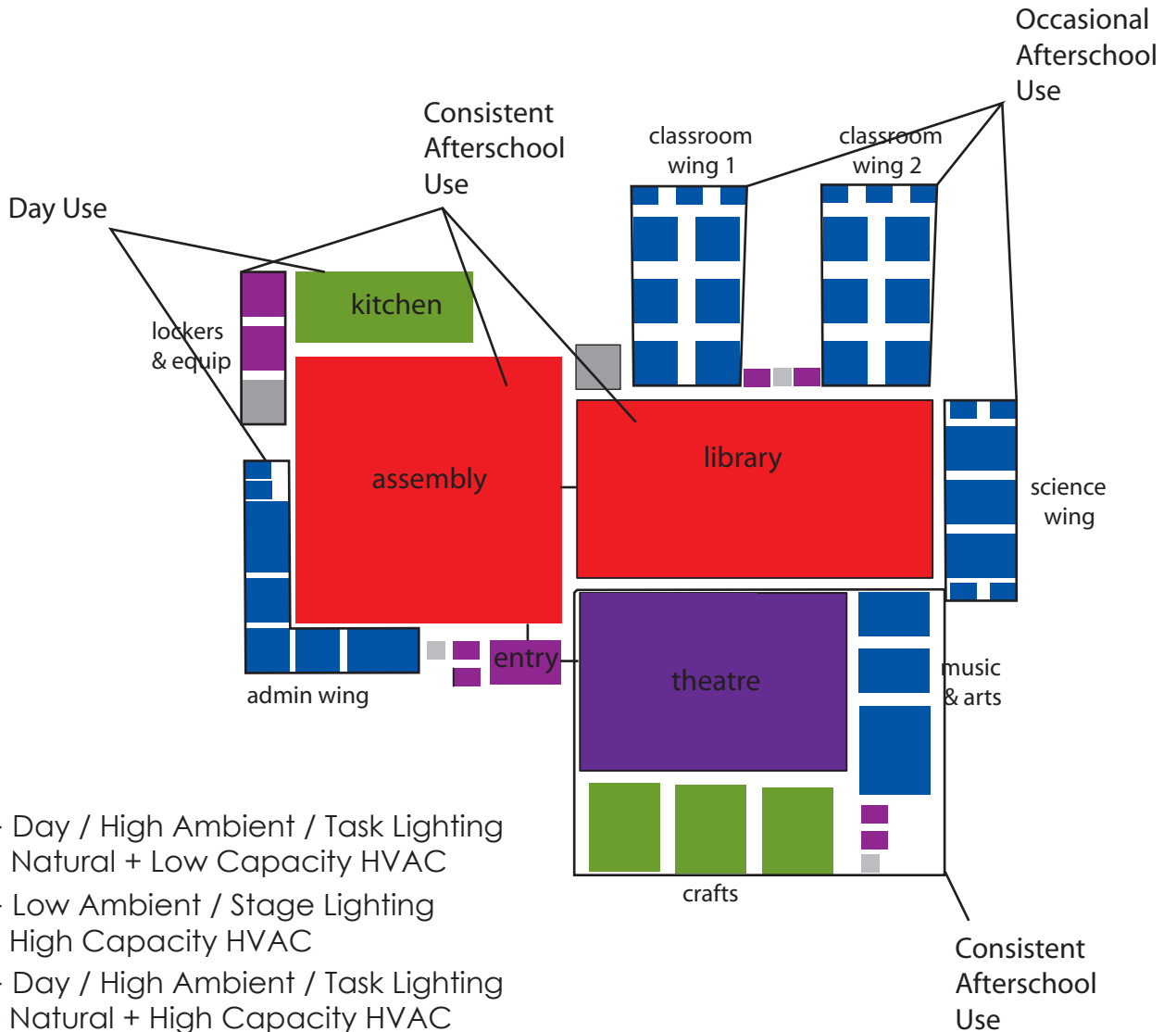
A.I.: Acoustic Isolation

Figure 3 - Spaces Grouped According to Energy Needs and Program



- Group 1- Day / High Ambient / Task Lighting
Natural + Low Capacity HVAC
- Group 2- Low Ambient / Stage Lighting
High Capacity HVAC
- Group 3- Day / High Ambient / Task Lighting
Natural + High Capacity HVAC
- Group 4- Day / Low Ambient / Task Lighting
Natural + High Capacity HVAC
- Group 5- Low Ambient
Low Capacity HVAC
- Group 6- Day / Low Ambient
Natural + Low Capacity HVAC

Figure 4 - Scheduling Needs



- Group 1- Day / High Ambient / Task Lighting
Natural + Low Capacity HVAC
- Group 2- Low Ambient / Stage Lighting
High Capacity HVAC
- Group 3- Day / High Ambient / Task Lighting
Natural + High Capacity HVAC
- Group 4- Day / Low Ambient / Task Lighting
Natural + High Capacity HVAC
- Group 5- Low Ambient
Low Capacity HVAC
- Group 6- Day / Low Ambient
Natural + Low Capacity HVAC

This suggests that conditioning to outer parts of the school may be turned off as soon as school ends while core spaces and extracurriculars are left on for a few more hours, reducing energy consumption significantly.

Bibliography

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