

INTRODUCTION

PROJECT BACKGROUND:

Regional School District 12 operates a middle - high school known as Shepaug Valley School that is a single story building of approximately 182,000 square feet. The school is located at 159 South Street, Washington, CT 06794. It was built beginning in 1970 and had its grand opening in 1972.

It is the goal of this project to renovate all of the approximately 10,000 SF that is dedicated to science labs located in an isolated wing of the building to new condition. The area has not been modified since its original construction in 1970 other than to add safety showers and eyewashes to each area.

The current science classroom/laboratory layout is inefficient and is best described as an obsolete circa 1970 open plan arrangement in need of modernization. The science area features built in lab furniture monument fixtures that house electrical, plumbing, propane gas and seating for each student. These furniture monument fixtures have failed in many ways. Most plumbing drains need attention and are buried in the floor slab preventing repairs. The propane gas piping has failed in all (6) areas and only (1) area has been re-piped to provide it with propane gas for experimentation purposes. Many of the seats that are an integral part of the lab furniture fixtures have broken and replacements are not available due to age. The layout of these furniture fixtures require students to sit at them for class and experimentation demonstrations making teaching difficult and non-flexible. Due to the layout, not all students face the teaching area where SMART board technology is being used for teaching purposes. The electrical outlets in each of the furniture fixtures has no GFCI protection and is within inches of the water supply. All tops on the monument fixtures are asbestos containing as are the sinks molded within them and the floor tiles that they are mounted to. The heating and cooling is accomplished through a Trane Voyager 20 Ton Roof Top unit that is in its (20th) year of a (20) year lifespan.

PROJECT OVERVIEW:

Area Renovation

The purpose of this renovation is to establish a positive learning environment that will open opportunities and expand the number of STEM courses available to the middle and high school students. The reorganized classrooms will better serve both students and staff in their mission to fulfill science requirements and to implement the science curriculum as adopted by the Regional School District 12 Board of Education

This project proposes to renovate and re-organize the entire science program. The new program will include: (5) Chemistry Classroom/Laboratories (CLABS), (1) Teacher's Preparation area / Workroom, a Chemical storage area and Maintenance / Custodial space. Safety eyewashes and showers will be included and have drains piped into the floor to allow for ease

of monthly inspections. The layout will allow for fixed lab equipment, sinks, hoods, stations, etc to be placed in a manner to allow for best student to student and also teacher engagement, additional moveable classroom furniture shall be used to create a learning environment in the rooms facing the teacher who will have access to the SMART board technology visible to all room occupants. The teacher area in the front of the classroom will be a dedicated lab setup also. ADA compliant work stations will be provided in each learning environment per Federal Code. Construction materials and room furnishings will be free of hazardous chemicals. The HVAC system will be designed to accommodate fresh air circulation per state code.

Student circulation to the new program spaces will be improved via the provision of two new corridors. An east/west corridor will bisect the space and extend from the Media Center to the exterior. Another corridor will directly align with existing corridors to the north and south. The proposed new spatial arrangement is guided by the location of existing structural columns.

The entire area will be essentially gutted. Loose furniture and educational materials will be removed and evaluated by the Region for potential reuse. The following will be removed and disposed of: windows, floor finishes, ceilings, lighting equipment, walls, doors and frames, ductwork and HVAC equipment and abandoned plumbing. If hazardous materials are encountered they will be abated in accordance with state and federal standards and codes.

New exterior doors will be provided at the end of the east/west corridor. New windows will be provided on the north, south and west sides of the Science Wing. New walls, floors, ceilings, an HVAC system and science equipment will be installed. The existing roof over this area shall remain.

SPECIFICATIONS FOR SPACE:

The following space specifications are desired outcomes of the project. Compromise may be required because of budget constraints. The classroom square footage is listed as approximations in order to enable freedom of design for a renovated science area. It is expected that design professionals will work with school administration and teachers in order to provide the best layout of classroom fixtures, LAN drops, and sources of power.

Space Specifications Summary:

| Space | Square Feet |
|------------------------------------------------|---------------------------------------|
| Chemistry classroom Labs - 24 student capacity | (5) @ approximately 1,100 to 1,400 SF |
| Teacher Work Room | (1) @ approximately 750 SF - minimum |

| | |
|-------------------------------------|--------------------------------------|
| Chemical Storage Room | (1) @ approximately 140 SF - minimum |
| Misc. maintenance and elec. support | (1) @ approximately 500 SF - maximum |

General Conditions

All instructional space should have the following: (some of which will be existing)

- Bulletin (display) boards
- White boards
- SMARTBoards with ultra-short throw projection system, sound bars and teacher presentation station for access (wireless preferred)
- Counters with enclosed lockable storage cabinets above and below the counter where applicable.
- Rubber tile flooring
- Connections to the school communication system
- Room darkening shades
- Full data/ voice/ video capacity (*access to a media distribution system, preferred*)
- Teacher computer workstation, at least 3-4 drops in the room for hard connections; access to a wireless LAN and WAN
- Teacher desk/workstation and chair
- Student tables with rolling capability and chairs that hang from the tables when not in use, according to function
- File cabinets
- Electrical outlets, spaced at least every six feet along each wall; additional outlets alongside computer workstations to support peripheral devices (a clustered charging area for BYOD device charging)
- Clock, flag, pencil sharpener
- Appropriate heat, ventilation, air conditioning and a fume hood in each room
- Consultation with the Director of Pupil Personnel Services about anticipated assistive technologies in various classrooms will be necessary.

General Classroom / Labs

All general classroom / labs must be flexible and adaptable to different uses. White boards, SMARTBoards, areas to display student work, fume hoods, projection screens and computer workstations for students and teachers need to be carefully designed and strategically placed in order to facilitate teaching and learning. A wireless network capacity will provide flexibility for student workstations. All classrooms / labs need to be equipped with phone systems allowing for internal as well as external communications.

TECHNOLOGY

The Technology infrastructure of the building is integral to supporting the educational goals of the students as well as the professional needs of the staff. The ability to be flexible in design to accommodate future technology growth is a critical component of any design. The renovated science areas should have 100% wireless coverage to support the mobility of teachers and students utilizing mobile devices as they move from individual to collaborative work across all spaces. The electrical and broadband wiring systems should be adequate to support the use of multiple devices at the same time without degradation of service and include protection against electrical surges that can damage technology equipment. The ability to monitor and possibly redirect the flow of traffic over these systems will be necessary for support of online student assessments.

Storage in classrooms must be adequate to securely store and charge student mobile devices such as Chromebooks and iPads and for teacher laptops to be secured. Presentation stations should include adequate space to place the teacher laptop, a document camera and any future peripheral devices and be locked when not in use. The teaching space must allow for the mobile use of technology in different configurations throughout the day (whole group, small group, collaborative, one-on-one, and adaptive). Due to the constantly changing dynamic of technology, the Region 12 IT Department must work closely with the architect to be sure the final renovated space is the most up-to-date infrastructure configuration.

SYSTEMS CONSIDERATIONS

It is the intent of the Board of Education that the building design and its operating systems should be compliant with all applicable state and federal codes.

It would be desirable to consider the use of non-proprietary systems where possible in each of the below systems except where specifically noted.

Internal Communications and Security

Telephone – Intercom- Public Address System. Each classroom / lab in the renovated science area should be tied into the main existing systems that allows for receiving emergency and routine announcements, making local area calls and communicating with the main office and other classrooms, accessing voice mail service inside and outside the building, and directing emergency assistance calls to one or more designated areas. Office areas in the renovated science area should be equipped with the additional services that: allow local and long distance calls.

Clock and bell system. Each room should have a clock and bell system that tie back into the existing systems.

Fire. The renovated science area shall be outfitted with fully code compliant smoke detection fire alarms that shall be tied back into the existing building systems. Alarms should be easily heard throughout the renovated areas. All required fire extinguishers should be placed into recessed cabinets with the doors on audible local alarms.

Building Systems:

Code compliance. All construction associated with the Science area renovations shall be in compliance with all local and state building, fire, health, and handicapped codes and regulations.

HVAC System. The heating, ventilating, and air conditioning system (HVAC) shall be thoroughly studied so the most reliable, flexible, and energy efficient system is provided. The renovated science areas should be air conditioned for warm weather use. An alternate energy efficient source of hot water for domestic use shall be provided for summer operation so major boilers may be shut down during non-heating seasons.

The HVAC system will be controlled by a Trane Tracer (DDC) direct digital control system located in the custodial office with remote access from outside the school.

The HVAC system should have the following characteristics:

- should be able to provide uniform temperature in all areas;
- should eliminate drafts and cold areas;
- should provide superior ventilation in all rooms and bathrooms;
- should eliminate noise in the classroom from the systems;
- should be able to provide for varying degrees of humidity control;
- should provide unquestioned reliability; and,
- should be energy-efficient and designed to be LEED Silver certifiable or equivalent.

Windows. All window frames and sash should be of a material that is maintenance free. The provision of glazing in the classroom is both an educational and psychological enhancement because it provides visual relief and outdoor observation opportunities. The provision of windows or glazing does, however, provide for heat loss or gain and a vulnerable point in security. The provision double-glazed windows with a solar block is desirable and should be considered in each room.

Physically challenged access. The renovated science area shall be in full compliance with state and federal handicapped codes and regulations.

Plumbing. All fixtures should be of the heaviest duty, vandal resistant design and include automatic source for water closets, urinals, and sinks. Adequate clean outs shall be provided and all safety showers / eyewash stations shall have a floor drain. Piping should run in accessible pipe chases. Adequate valve placement should allow for shutting down

sections of the renovated science areas to allow for local repairs without shutting down the entire system. Valves should be ball valves.

Electrical distribution. The renovated science areas should exceed minimum code requirements for electrical service. Each normally occupied space shall be furnished with numerous electrical convenience outlets located throughout the space for maximum flexibility of room layout and eliminating a need for use of extension cords. Power in each classroom / lab should come from two sources, one for exclusive use of computers and peripherals and the other for general use. There should be a separate service for the technology infrastructure. Each electrical panel should have 25% free space to add future circuits. Emergency lighting should be on individual wall packs. All three phase motors should have phase protection. All exit signs should be L.E.D. type with cast housings and Lexan lenses.

Exterior building structure. All windows should be high "e" insulated windows with screens.

Hardware. All hardware in the renovated science areas should be heavy duty (commercial grade). All panic devices should be rim type with removable mullions rather than vertical rod type. All doors such as corridor-smoke doors, etc. should be held open with magnetic devices connected to the fire alarm system.

Security. Keying should be suited to the existing mastered system.

CCTV. A fully functional existing security camera system is installed throughout the school. The renovated science area camera/s shall be tied back into the existing system and be confirmed as operational.

Fume Hoods. Each Classroom and the Teachers work room shall have a fume hood ducted to the exterior of the building with local shutoffs accessible to allow for on / off by teachers.

CAPACITY AND ENROLMENT DATA:

Below are the most recent charts of enrolment data for District 12.

| Appendix D. Region 12 Enrollment Projected by Grade to 2024: Grades PK-5 | | | | | | | | | | |
|---------------------------------------------------------------------------------|-------------------|---------------------------|----------|----------|----------|----------|----------|----------|-----------|----------------------------------------|
| School Year | Birth Year | Births¹ | K | 1 | 2 | 3 | 4 | 5 | PK | Total PK-5 |
| 2004-05 | 1999 | 61 | 63 | 88 | 81 | 74 | 76 | 66 | 18 | 466 |
| 2005-06 | 2000 | 59 | 56 | 62 | 87 | 82 | 78 | 82 | 19 | 466 |
| 2006-07 | 2001 | 60 | 67 | 62 | 64 | 87 | 77 | 79 | 20 | 456 |
| 2007-08 | 2002 | 71 | 57 | 68 | 62 | 59 | 88 | 78 | 21 | 433 |
| 2008-09 | 2003 | 57 | 59 | 56 | 74 | 64 | 60 | 86 | 21 | 420 |
| 2009-10 | 2004 | 58 | 48 | 64 | 54 | 78 | 64 | 60 | 29 | 397 |
| 2010-11 | 2005 | 56 | 46 | 51 | 63 | 54 | 80 | 65 | 19 | 378 |
| 2011-12 | 2006 | 56 | 51 | 44 | 54 | 64 | 57 | 80 | 17 | 367 |
| 2012-13 | 2007 | 35 | 36 | 55 | 37 | 48 | 64 | 61 | 21 | 322 |
| 2013-14 | 2008 | 40 | 33 | 38 | 56 | 37 | 49 | 63 | 28 | 304 |
| 2014-15 | 2009 | 37 | 35 | 37 | 39 | 59 | 38 | 47 | 31 | 286 |
| Projected | | | | | | | | | | |
| 2015-16 | 2010 | 50 | 44 | 38 | 37 | 40 | 61 | 40 | 31 | 291 |
| 2016-17 | 2011 | 41 | 37 | 47 | 38 | 38 | 41 | 62 | 31 | 294 |
| 2017-18 | 2012 | 28 | 25 | 40 | 47 | 39 | 39 | 41 | 31 | 262 |
| 2018-19 | 2013 | 32 | 28 | 27 | 40 | 47 | 40 | 39 | 31 | 252 |
| 2019-20 | 2014 | 33 | 28 | 29 | 27 | 40 | 48 | 39 | 31 | 242 |
| 2020-21 | 2015 | 32 | 28 | 30 | 29 | 28 | 42 | 49 | 31 | 237 |
| 2021-22 | 2016 | 32 | 29 | 30 | 30 | 30 | 29 | 42 | 31 | 221 |
| 2022-23 | 2017 | 32 | 29 | 31 | 30 | 31 | 31 | 28 | 31 | 211 |
| 2023-24 | 2018 | 32 | 29 | 31 | 31 | 31 | 32 | 30 | 31 | 215 |
| 2024-25 | 2019 | 32 | 29 | 31 | 31 | 32 | 32 | 32 | 31 | 218 |
| Projection Growth Rates | | | | | | | | | | |
| Annual Growth Rates | | | | | | | | | | Estimated Migration⁴ |
| 2005 | | | 0.949 | 0.984 | 0.989 | 1.012 | 1.054 | 1.079 | | 1.67% |
| 2006 | | | 1.117 | 1.107 | 1.032 | 1.000 | 0.939 | 1.013 | | -1.64% |
| 2007 | | | 0.803 | 1.015 | 1.000 | 0.922 | 1.011 | 1.013 | | 0.66% |
| 2008 | | | 1.035 | 0.982 | 1.088 | 1.032 | 1.017 | 0.977 | | 1.33% |
| 2009 | | | 0.828 | 1.085 | 0.964 | 1.054 | 1.000 | 1.000 | | 1.80% |
| 2010 | | | 0.821 | 1.063 | 0.984 | 1.000 | 1.026 | 1.016 | | 0.47% |
| 2011 | | | 0.911 | 0.957 | 1.059 | 1.016 | 1.056 | 1.000 | | 1.21% |
| 2012 | | | 1.029 | 1.078 | 0.841 | 0.889 | 1.000 | 1.070 | | -2.34% |
| 2013 | | | 0.825 | 1.056 | 1.018 | 1.000 | 1.021 | 0.984 | | -0.28% |
| 2014 | | | 0.946 | 1.121 | 1.026 | 1.054 | 1.027 | 0.959 | | -2.04% |
| 3-Year Ave. | | | 0.933 | 1.085 | 0.962 | 0.981 | 1.016 | 1.005 | | |
| Weighted 3-Year | | | 0.919 | 1.092 | 0.993 | 1.008 | 1.020 | 0.986 | | |
| 5-Year Ave. | | | 0.919 | 1.092 | 0.993 | 1.008 | 1.020 | 0.986 | | |
| Weighted 5-year | | | 0.917 | 1.069 | 0.989 | 0.998 | 1.024 | 0.997 | | |

¹ Births 1999 to 2014 are from the State Department of Public Health. The 2013 figure is preliminary.

Births in 2014 are my estimate from an analysis of in-state births through November.

Births in 2015 set to average of 2013 and 2014 births ² Projection based on sum of projections by grade within town.

³ Kindergarten based on 3-year weighted averages of estimated yield from births five- and six-years ago and retention by town.

⁴ Estimated by comparing the enrollment in grades 3-8 one year with the enrollment in grades 2-7 the prior year with an adjustment for residents out to public schools

| Appendix E. Region 12 Enrollment Projected by Grade to 2024: Grades 6-12 | | | | | | | | | | |
|---------------------------------------------------------------------------------|----------|--------------|--------------|--------------|--------------|--------------|--------------|------------------|-------------------|------------------------------|
| School Year | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 6-8 Total | 9-12 Total | PK-12 Total |
| 2004-05 | 88 | 94 | 99 | 109 | 103 | 113 | 85 | 281 | 410 | 1,157 |
| 2005-06 | 68 | 89 | 88 | 106 | 100 | 99 | 108 | 245 | 413 | 1,124 |
| 2006-07 | 80 | 66 | 88 | 93 | 99 | 104 | 96 | 234 | 392 | 1,082 |
| 2007-08 | 80 | 81 | 71 | 96 | 93 | 103 | 101 | 232 | 393 | 1,058 |
| 2008-09 | 77 | 82 | 85 | 73 | 91 | 83 | 100 | 244 | 347 | 1,011 |
| 2009-10 | 90 | 78 | 80 | 87 | 70 | 88 | 78 | 248 | 323 | 968 |
| 2010-11 | 59 | 89 | 79 | 87 | 92 | 67 | 80 | 227 | 326 | 931 |
| 2011-12 | 64 | 61 | 88 | 76 | 77 | 84 | 69 | 213 | 306 | 886 |
| 2012-13 | 78 | 60 | 61 | 82 | 73 | 80 | 85 | 199 | 320 | 841 |
| 2013-14 | 63 | 75 | 62 | 59 | 76 | 77 | 80 | 200 | 292 | 796 |
| 2014-15 | 59 | 62 | 73 | 65 | 53 | 76 | 73 | 194 | 267 | 747 |
| Projected | | | | | | | | | | |
| 2015-16 | 46 | 58 | 62 | 73 | 61 | 53 | 74 | 166 | 261 | 714 |
| 2016-17 | 38 | 45 | 58 | 62 | 69 | 61 | 52 | 141 | 244 | 674 |
| 2017-18 | 61 | 37 | 45 | 57 | 59 | 69 | 60 | 143 | 245 | 640 |
| 2018-19 | 38 | 60 | 37 | 46 | 54 | 59 | 68 | 135 | 227 | 604 |
| 2019-20 | 35 | 37 | 60 | 37 | 43 | 54 | 58 | 132 | 192 | 561 |
| 2020-21 | 36 | 34 | 37 | 60 | 35 | 43 | 53 | 107 | 191 | 528 |
| 2021-22 | 46 | 35 | 34 | 37 | 57 | 35 | 42 | 115 | 171 | 501 |
| 2022-23 | 38 | 45 | 35 | 35 | 35 | 57 | 34 | 118 | 161 | 486 |
| 2023-24 | 28 | 37 | 45 | 37 | 33 | 35 | 56 | 110 | 161 | 481 |
| 2024-25 | 29 | 27 | 37 | 46 | 35 | 33 | 34 | 93 | 148 | 452 |
| Projection Growth Rates¹ | | | | | | | | | | |
| | 0.982 | 0.981 | 1.002 | 0.929 | 0.946 | 0.993 | 0.980 | | | |
| Annual Growth Rates² | | | | | | | | | | |
| | | | | | | | | | | Migration² |
| 2005 | 1.030 | 1.011 | 0.936 | 0.939 | 0.917 | 0.961 | 0.956 | | | 1.67% |
| 2006 | 0.976 | 0.971 | 0.989 | 0.886 | 0.934 | 1.040 | 0.970 | | | -1.64% |
| 2007 | 1.013 | 1.013 | 1.076 | 0.920 | 1.000 | 1.040 | 0.971 | | | 0.66% |
| 2008 | 0.987 | 1.025 | 1.049 | 0.901 | 0.948 | 0.892 | 0.971 | | | 1.33% |
| 2009 | 1.047 | 1.013 | 0.976 | 0.953 | 0.959 | 0.967 | 0.940 | | | 1.80% |
| 2010 | 0.983 | 0.989 | 1.013 | 1.013 | 1.057 | 0.957 | 0.909 | | | 0.47% |
| 2011 | 0.985 | 1.034 | 0.989 | 0.899 | 0.885 | 0.913 | 1.030 | | | 1.21% |
| 2012 | 0.975 | 0.938 | 1.000 | 0.830 | 0.961 | 1.039 | 1.012 | | | -2.34% |
| 2013 | 1.033 | 0.962 | 1.033 | 0.951 | 0.927 | 1.055 | 1.000 | | | -0.28% |
| 2014 | 0.937 | 0.984 | 0.973 | 0.952 | 0.898 | 1.000 | 0.948 | | | -2.04% |
| 3-Year Ave. | 0.981 | 0.961 | 1.002 | 0.911 | 0.929 | 1.031 | 0.987 | | | |
| Weighted 3-Year | 0.975 | 0.969 | 0.998 | 0.931 | 0.918 | 1.025 | 0.976 | | | |
| 5-Year Ave. | 0.982 | 0.981 | 1.002 | 0.929 | 0.946 | 0.993 | 0.980 | | | |
| Weighted 5-year | 0.979 | 0.976 | 0.999 | 0.924 | 0.927 | 1.008 | 0.983 | | | |

¹ Grades 6-12 based on 5-year averages of annual growth rates.

² Grade 9 rates adjusted for residents only. Projected Sherman enrollment added to resident projection.

² Estimated by comparing the enrollment in grades 3-8 one year with the enrollment in grades 2-7 the prior year with an adjustment for no

PURPOSE OF EDUCATIONAL SPECIFICATIONS:

The National Council of Educational Planners (2006) has stated:

Educational specifications or program requirements are the means by which educators describe the educational activities and spaces which need to be incorporated in proposed new or renovated facilities. They are written statements that serve as a vehicle of communication between educators and community and, ultimately, educators and the architect.

Educational specification spell out the type of activity, the number persons, and the space requirements needed in order to meet the educational goals and objectives of the program housed in the facility. Educational specifications do not represent architectural solutions but, rather, they inform architectural decisions and provide a framework within which design solutions are formulated.

Educational specifications are the cornerstone of successful school building programs. Good educational specifications provide a comprehensive overview of the program of instruction to be housed, the activities to be encouraged and the facilities necessary to carry out the goals and objectives of the school system.

The Connecticut State Department of Education defines educational specifications as a description of the general nature and purposes of the proposed school building project, including the applicant's long-range educational plan and relationship of the proposed project to such plan; enrollment data and proposed project capacity; the nature and organization of the educational program; support facilities; space needs; specialized equipment; environmental controls; and site needs.

The specific purposes for educational specifications as part of the construction grant approval process are as follows:

1. For the educational agency to justify the need for the proposed school building project.
2. For the educational agency to describe the educational activities that a proposed school building project is to support and the types of spaces which will best accommodate program requirements.
3. For the State Department of Education to determine the nature, scope, feasibility and funding level for the proposed school building project.
4. For the partial fulfillment of the requirements of Section 10-287c11(a) of the Administrative Regulations for a building grant application.

CATEGORY PRIORITY:

This is a category One (1) Project in accordance with the requirements of Section 10-283 (a-6) of the Regulations of Connecticut State Agencies, which states that category One Projects are primarily required to do the following:

Create new facilities or alter existing facilities to provide for mandatory instructional programs pursuant to Title 10 of the general Statutes, including, but not limited to special education; the arts; career education; consumer education; health and safety; language arts, including reading, writing, grammar, speaking, spelling, and library media centers; mathematics; physical education; science, including laboratories; and at the secondary level one or more foreign languages and vocational education including shops; or for physical education facilities in compliance with Title IX of the US Elementary and Secondary Education Act of 1972 where such programs or such compliance cannot be provided within existing facilities.