

Regional School District 12 Bridgewater, Roxbury and Washington, Connecticut

Educational Specifications

For

**Science Labs Renovations
Shepaug Valley School**

Regional School District 12

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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 specifications spell out the type of activity, the number of 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.

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 06793. 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 8,000 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 have no GFCI protection and are within inches of the water supply. All tops on the monument fixtures contain asbestos as do 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 Rooftop 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 while providing safe, updated class and lab areas. 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 reorganize the entire science program. The new program will include: (4) Chemistry Classroom/Laboratories (CLABS), (1) Teachers' Preparation area / Workroom, a Chemical storage area and Maintenance / Custodial closet. 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 workstations 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 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, new windows, 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	(4) @ approximately 1,100 to 1,400 SF
Teacher Prep Area	(1) @ approximately 700 SF - minimum
Chemical Storage Room	(1) @ approximately 175 SF - minimum
Misc. maintenance and elec. support	(1) @ approximately 150 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.

Classrooms / Labs

All classrooms / 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. Teacher prep areas in the renovated science area should be equipped with the additional services that allow local and long distance calls.

Clock and bell system. Presently, wireless clock systems are utilized. 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 and heat 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 federal, state, and local 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 an existing 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;
- should be balanced and considerate of the fume hoods.

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 cleanouts 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 enrollment data for District 12.

Appendix D. Region 12 Enrollment Projected by Grade to 2025: Grades PK-5										
School Year	Birth Year	Births ¹	K	1	2	3	4	5	PK	Total PK-5
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
2015-16	2010	50	35	36	37	42	57	40	42	289
Projected										
2016-17	2011	41	38	38	36	39	43	59	42	295
2017-18	2012	28	25	41	38	38	40	44	42	268
2018-19	2013	32	28	28	41	40	39	41	42	259
2019-20	2014	37	32	30	28	43	41	40	42	256
2020-21	2015	42	37	35	30	29	44	43	42	260
2021-22	2016	39	34	40	35	32	30	46	42	259
2022-23	2017	39	34	37	40	37	33	31	42	254
2023-24	2018	39	34	37	37	42	38	34	42	264
2024-25	2019	39	34	37	37	39	43	39	42	271
2025-26	2020	39	34	37	37	39	40	44	42	273
Projection Growth Rates										
										Estimated Migration⁴
Annual Growth Rates										
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%
2015			0.700	1.029	1.000	1.077	0.966	1.053		1.00%
3-Year Ave.			0.824	1.068	1.015	1.043	1.005	0.999		
Weighted 3-Year			0.803	1.064	1.012	1.056	0.996	1.010		
5-Year Ave.			0.882	1.048	0.989	1.007	1.014	1.013		
Weighted 5-year			0.848	1.061	0.993	1.026	1.004	1.013		

¹ Births 2000 to 2014 are from the State Department of Public Health. The 2013 and 2014 figures are preliminary.

Births in 2015 are my estimate from an analysis of in-state births through October.

Births in 2016-20 set to average of 2014 and 2015 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 D. Region 12 Enrollment Projected by Grade to 2025: Grades 6-12										
School Year	6	7	8	9	10	11	12	6-8 Total	9-12 Total	PK-12 Total
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
2015-16	50	63	64	66	67	51	78	177	262	728
Projected										
2016-17	39	50	64	61	63	67	51	153	242	690
2017-18	57	39	51	60	58	63	66	147	247	662
2018-19	43	57	40	51	57	58	62	140	228	627
2019-20	40	43	58	40	49	57	58	141	204	601
2020-21	39	40	44	57	38	49	57	123	201	584
2021-22	42	39	41	44	54	38	49	122	185	566
2022-23	45	42	40	40	42	54	38	127	174	555
2023-24	30	45	43	41	38	42	54	118	175	557
2024-25	33	30	46	43	39	38	42	109	162	542
2025-26	38	33	30	44	41	39	38	101	162	536
Projection Growth Rates¹										
	0.972	0.999	1.013	0.898	0.952	1.006	0.991			
Annual Growth Rates²										Migration³
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	1.016	0.962	1.033	0.951	0.927	1.055	1.000			-0.28%
2014	0.921	0.968	0.973	0.935	0.898	1.000	0.948			-2.04%
2015	0.979	1.069	1.033	0.808	1.031	0.962	1.026			1.00%
3-Year Ave.	0.972	0.999	1.013	0.898	0.952	1.006	0.991			
Weighted 3-Year	0.966	1.017	1.013	0.874	0.969	0.990	0.996			
5-Year Ave.	0.975	0.994	1.006	0.885	0.940	0.994	1.003			
Weighted 5-year	0.971	1.001	1.010	0.880	0.956	0.998	0.998			

¹ Grades 6-12 based on 3-year averages of annual growth rates.

² Grade 9 rates adjusted for residents only. Projected Sherman enrollment added to resident projection. Italicized growth rates adjusted for enrollment of children of teachers and New Milford residents (in 2015).

³ 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 non-residents in and residents out to public schools