December 1, 2014 Staples High School

WESTPORT BOARD OF EDUCATION

*AGENDA

(Agenda Subject to Modification in Accordance with Law)

PUBLIC CALL TO ORDER:
6:00 p.m., Staples High School, Room 1025C, Principal's Conference Room

ANTICIPATED EXECUTIVE SESSION: Strategies for Negotiations, Security

RESUME PUBLIC SESSION

PLEDGE OF ALLEGIANCE: Staples High School, Cafeteria B (Room 301), **7:00 p.m.**

ANNOUNCEMENTS FROM BOARD AND ADMINISTRATION

MINUTES: November 17, 2014

PUBLIC QUESTIONS/COMMENTS ON NON-AGENDA ITEMS (15 MINUTES)

DISCUSSION:

1. NESDEC Enrollment Projections	(Encl.)	Don Kennedy
2. 2015-16 Preliminary Budget Discussions with Board of Finance		
3. Progress Report: National Executive Service Corps	(Encl.)	Ms. Aronow Ms. Kleine

REPORTS:

1. Implementation of SBAC Testing Program And Benefits and Efficacy of Standardized and AP Tests	(Encl.)	Mr. D'Amico Ms. Droller Ms. Carrignan
2. Kindergarten Evaluation and Recommended Modifications to Program	(Encl.)	Ms. Droller

DISCUSSION/ACTION:

1. Acceptance of Gifts	(Encl.)	Dr. Landon
2. Approval: RFP for School Security Communications Systems	(Encl.)	Mr. Longo

ADJOURNMENT

*A 2/3 vote is required to go to executive session, to add a topic to the agenda of a regular meeting, or to start a new topic after 10:30 p.m.
The meeting can also be viewed on cable TV on channel 78; AT&T channel 99 and by video stream @www.westport.k12.ct.us

PUBLIC PARTICIPATION WELCOME USING THE FOLLOWING GUIDELINES:

- Comment on non-agenda topics will occur during the first 15 minutes *except* when staff or guest presentations are scheduled.
- Board will not engage in dialogue on non-agenda items.
- Public may speak as agenda topics come up for discussion or information.
- Speakers on non-agenda items are limited to 2 minutes each, except by prior arrangement with chair.
- Speakers on agenda items are limited to 3 minutes each, except by prior arrangement with chair.
- Speakers must give name and use microphone.
- Responses to questions may be deferred if answers not immediately available.
- Public comment is normally not invited for topics listed for action after having been publicly discussed at one or more meetings.

WESTPORT PUBLIC SCHOOLS

ELLIOTT LANDON
Superintendent of Schools

110 MYRTLE AVENUE
WESTPORT, CONNECTICUT 06880
TELEPHONE: (203) 341-1010
FAX: (203) 341-1029

To: Members of the Board of Education

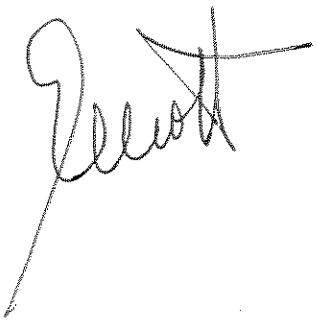
From: Elliott Landon

Subject: NESDEC Enrollment Projections, 2015-2020

Date: December 1, 2014

You will find appended to this memorandum Power Point slides that will be referred to by Dr. Donald Kennedy of the New England School Development Council (NESDEC) during his presentation related to the above-referenced subject at our meeting of December 1.

Dr. Kennedy will make his presentation directly to the Board of Education. Since the presentation will precede the preliminary discussions with the Board of Finance pertaining to the preparation of the Board of Education's proposed budget for the 2015-16 school year, members of the Board of Finance and invited representatives of the RTM also will be present with us for our discussions concerning enrollment projections.



NESDEC

New England School Development Council

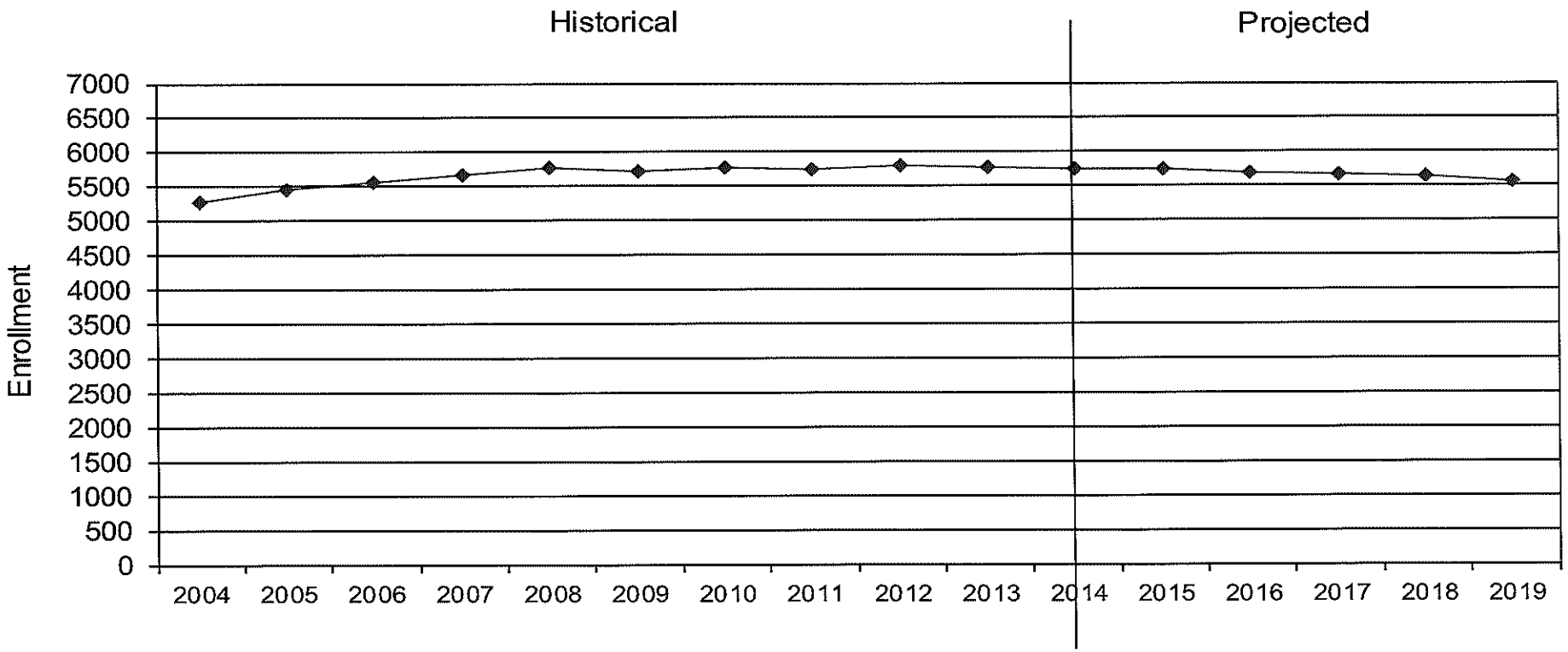
WESTPORT, CONNECTICUT
Enrollment Projections

Donald G. Kennedy, Ed.D.

December 1, 2014

Westport, CT Historical & Projected Enrollment

PK-12, 2004-2019



Westport, CT Historical Enrollment

School District: **Westport, CT** **11/24/2014**

Historical Enrollment By Grade

Birth Year	Births	School Year	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	UNGR	K-12	PK-12
1999	314	**2004-05**	51	375	396	430	435	445	412	465	403	410	387	401	327	344	0	5230	5281
2000	339	**2005-06**	56	415	401	410	439	438	453	428	480	413	420	394	393	323	0	5407	5463
2001	284	**2006-07**	48	380	441	415	435	434	439	460	419	492	412	428	385	382	0	5522	5570
2002	300	**2007-08**	55	370	418	461	425	443	440	448	464	430	488	413	433	390	0	5623	5678
2003	306	**2008-09**	57	408	412	430	465	433	436	452	446	471	438	484	413	430	0	5718	5775
2004	264	**2009-10**	52	377	430	406	442	464	422	448	443	445	467	436	476	408	0	5664	5716
2005	265	**2010-11**	53	393	402	441	421	464	446	437	445	443	464	468	434	471	0	5729	5782
2006	230	**2011-12**	39	356	401	423	442	428	474	460	436	456	467	463	471	428	0	5705	5744
2007	194	**2012-13**	46	364	386	421	431	451	438	479	462	439	479	468	469	466	0	5753	5799
2008	221	**2013-14**	41	364	388	398	435	450	461	446	484	461	442	476	465	454	0	5724	5765
2009	168	**2014-15**	51	343	390	408	412	449	439	468	445	489	472	442	478	463	0	5698	5749

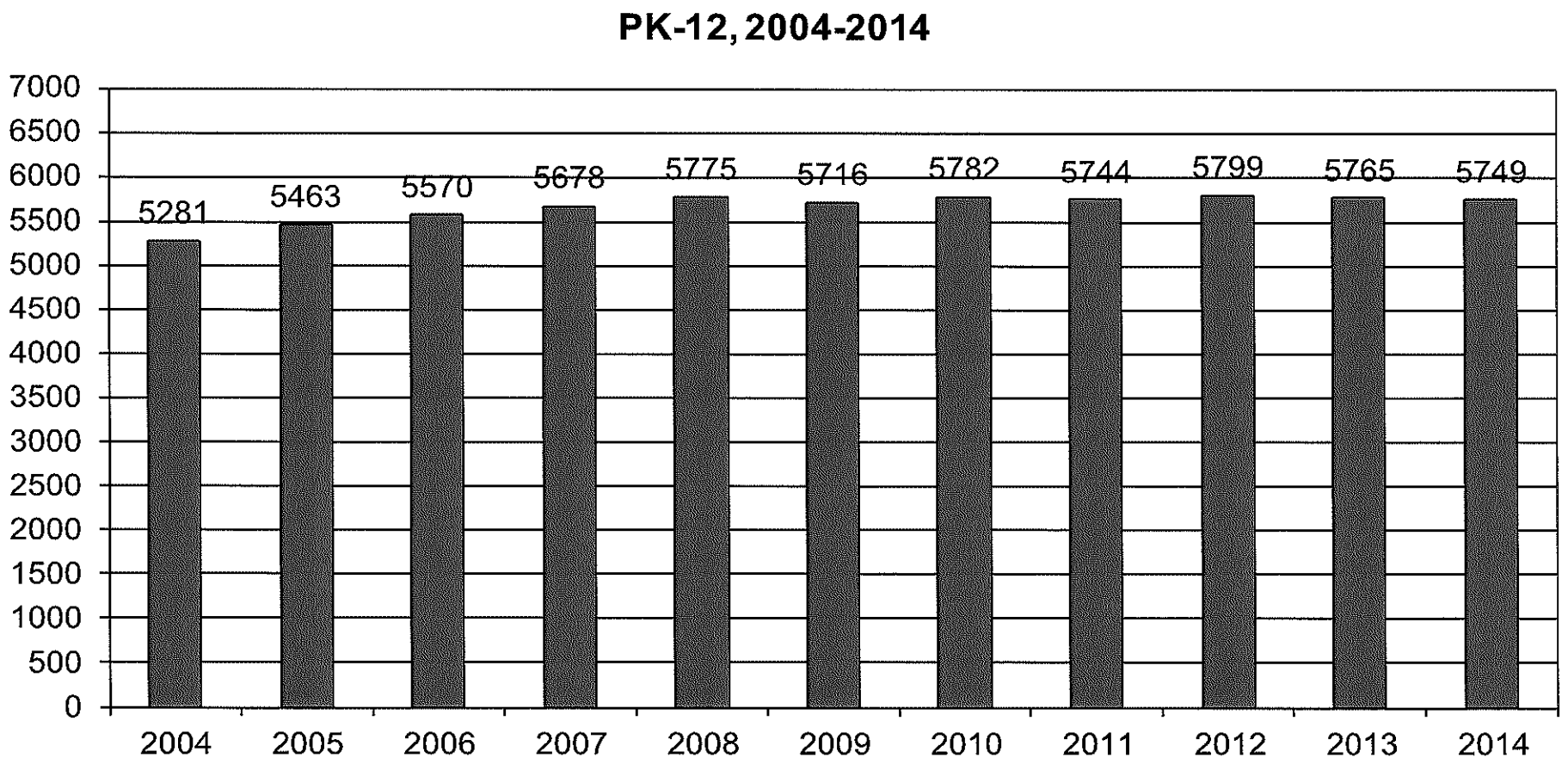
Historical Enrollment in Grade Combinations

Year	PK-5	K-5	K-6	K-8	5-8	6-8	7-8	7-12	9-12
2004-05	2544	2493	2958	3771	1690	1278	813	2272	1459
2005-06	2612	2556	2984	3877	1774	1321	893	2423	1530
2006-07	2592	2544	3004	3915	1810	1371	911	2518	1607
2007-08	2612	2557	3005	3899	1782	1342	894	2618	1724
2008-09	2641	2584	3036	3953	1805	1369	917	2682	1765
2009-10	2593	2541	2989	3877	1758	1336	888	2675	1787
2010-11	2620	2567	3004	3892	1771	1325	888	2725	1837
2011-12	2563	2524	2984	3876	1826	1352	892	2721	1829
2012-13	2537	2491	2970	3871	1818	1380	901	2783	1882
2013-14	2537	2496	2942	3887	1852	1391	945	2782	1837
2014-15	2492	2441	2909	3843	1841	1402	934	2789	1855

Historical Percentage Changes

Year	K-12	Diff.	%
2004-05	5230	0	0.0%
2005-06	5407	177	3.4%
2006-07	5522	115	2.1%
2007-08	5623	101	1.8%
2008-09	5718	95	1.7%
2009-10	5664	-54	-0.9%
2010-11	5729	65	1.1%
2011-12	5705	-24	-0.4%
2012-13	5753	48	0.8%
2013-14	5724	-29	-0.5%
2014-15	5698	-26	-0.5%
Change		**468**	**8.9%**

Westport, CT Historical Enrollment



Westport, CT Projected Enrollment

School District: **Westport, CT** **11/24/2014**

In 2014-15 there are 305 four-year olds known to be in Preschool placements

Enrollment Projections By Grade*

Birth Year	Births		School Year	PK	K	1	2	3	4	5	6	7	8	9	10	11	12	UNGR	K-12	PK-12
2009	168		2014-15	51	343	390	408	412	449	439	468	445	489	472	442	478	463	0	5698	5749
2010	192		2015-16	52	361	369	407	420	426	452	445	470	447	502	471	444	471	0	5685	5737
2011	176		2016-17	53	331	388	385	419	434	429	459	447	472	459	501	473	438	0	5635	5688
2012	175	(prov.)	2017-18	54	329	356	405	396	433	437	435	461	449	485	458	503	466	0	5613	5667
2013	186	(est.)	2018-19	55	350	354	372	417	409	436	443	437	463	461	484	460	496	0	5582	5637
2014	179	(est.)	2019-20	56	337	376	370	383	431	412	442	445	439	476	460	486	453	0	5510	5566

*Projections should be updated on an annual basis.

Based on an estimate of births | Based on children already born | Based on students already enrolled

Projected Enrollment in Grade Combinations*

Year	PK-5	K-5	K-6	K-8	5-8	6-8	7-8	7-12	9-12
2014-15	2492	2441	2909	3843	1841	1402	934	2789	1855
2015-16	2487	2435	2880	3797	1814	1362	917	2805	1888
2016-17	2439	2386	2845	3764	1807	1378	919	2790	1871
2017-18	2410	2356	2791	3701	1782	1345	910	2822	1912
2018-19	2393	2338	2781	3681	1779	1343	900	2801	1901
2019-20	2365	2309	2751	3635	1738	1326	884	2759	1875

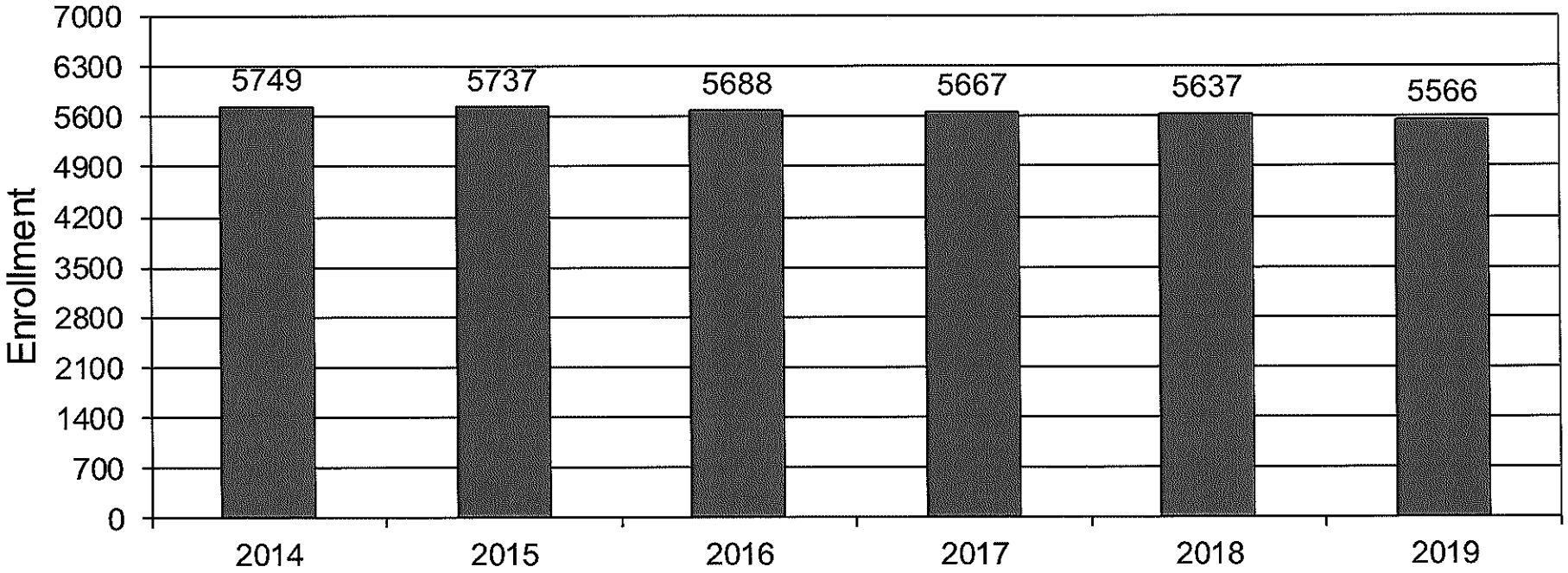
See "Reliability of Enrollment Projections" section of accompanying letter.
Projections are more reliable for Years #1-5 in the future than for Years #6 and beyond.

Projected Percentage Changes

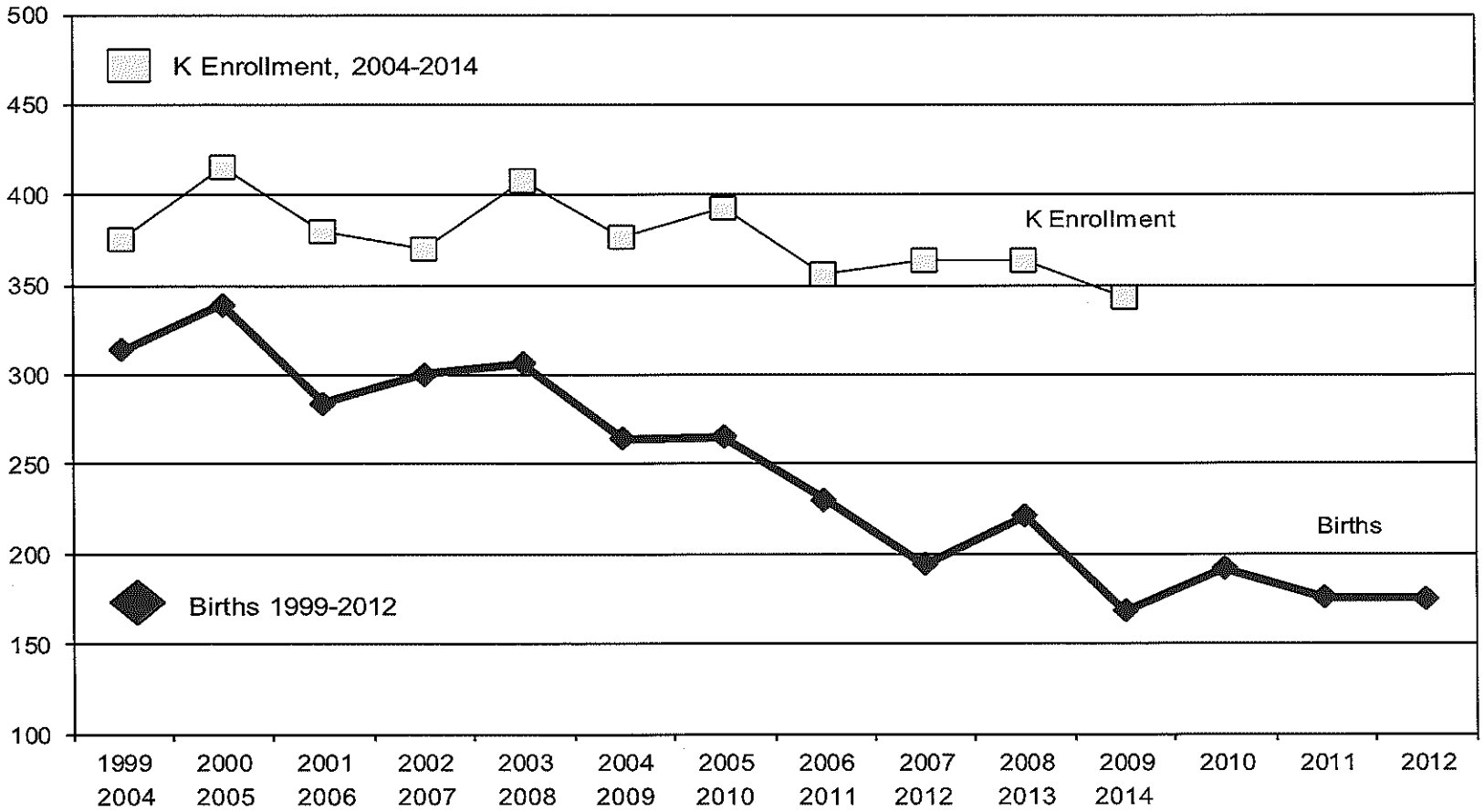
Year	K-12	Diff.	%
2014-15	5698	0	0.0%
2015-16	5685	-13	-0.2%
2016-17	5635	-50	-0.9%
2017-18	5613	-22	-0.4%
2018-19	5582	-31	-0.6%
2019-20	5510	-72	-1.3%
Change		-188	-3.3%

Westport, CT Projected Enrollment

PK-12 TO 2024 Based On Data Through School Year 2014-15



Westport, CT Birth-to-Kindergarten Relationship



35 Years of Westport's Birth-to-Kindergarten Experience + 2015-16 Projection

Birth Year	Westport Births	Kind. Year	# in Kind.	Net move-in's	Birth-K Ratio
1975	163	**1980-81**	169	6	1.04
1976	137	**1981-82**	169	32	1.23
1977	156	**1982-83**	138	-18	0.88
1978	148	**1983-84**	139	-9	0.94
1979	162	**1984-85**	150	-12	0.93
1980	163	**1985-86**	191	28	1.17
1981	169	**1986-87**	180	11	1.07
1982	141	**1987-88**	167	26	1.18
1983	171	**1988-89**	205	34	1.2
1984	204	**1989-90**	254	50	1.25
1985	197	**1990-91**	241	44	1.22
1986	223	**1991-92**	293	70	1.31
1987	263	**1992-93**	309	46	1.17
1988	249	**1993-94**	318	69	1.28
1989	270	**1994-95**	350	80	1.3
1990	284	**1995-96**	391	107	1.38
1991	276	**1996-97**	402	126	1.46
1992	290	**1997-98**	390	100	1.34
1993	357	**1998-99**	431	74	1.21
1994	299	**1999-00**	411	112	1.37
1995	366	**2000-01**	428	62	1.17
1996	357	**2001-02**	418	61	1.17
1997	326	**2002-03**	385	59	1.18
1998	309	**2003-04**	369	60	1.19
1999	314	**2004-05**	375	61	1.19
2000	339	**2005-06**	415	76	1.22
2001	284	**2006-07**	380	96	1.34
2002	300	**2007-08**	370	70	1.23
2003	306	**2008-09**	408	102	1.33
2004	264	**2009-10**	377	113	1.43
2005	265	**2010-11**	393	128	1.48
2006	230	**2011-12**	356	126	1.55
2007	194	**2012-13**	364	170	1.88
2008	221	**2013-14**	364	143	1.65
2009	168	**2014-15**	343	175	2.04
2010	192	**2015-16**	361	169	1.88

New England School Development Council November 24, 2014

"Net Move-in's" of 100 or over in red

Westport, CT Additional Data

Building Permits Issued		
Year	Single-Family	Multi-Units
2005	114	0
2010	63	0
2011	72	0
2012	86	4
2013	103	0
2014	72 to Oct 31	54 to Oct 31

Source: HUD and Building Department
Demolitions: 2013 = 107; 2014 = 90

Enrollment History		
Year	Voc-Tech 9-12 Total	Non-Public K-12 Total
2005-06	n/a	412
2010-11	n/a	619
2011-12	n/a	n/a
2012-13	n/a	n/a
2013-14	n/a	n/a
2014-15	n/a	481

Residents in Non-Public Independent and Parochial Schools (General Education)														
Enrollments as of Oct. 1	K	1	2	3	4	5	6	7	8	9	10	11	12	K-12 TOTAL
	23	31	33	23	33	51	44	53	46	44	32	41	27	481

K-12 Home-Schooled Students	
2014	8

K-12 Residents "Choiced-out" or in Charter or Magnet Schools	
2014	0

K-12 Special Education Outplaced Students	
2014	30

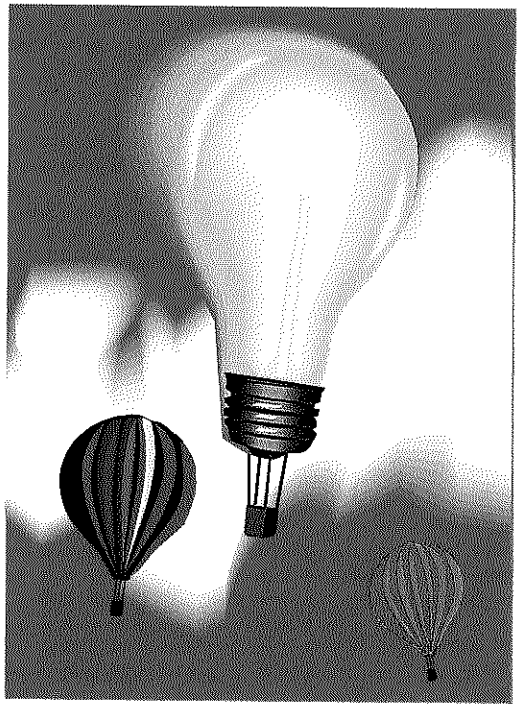
K-12 Choiced-In, Tuitioned-In, & Other Non-Residents	
2014	0

The above data were used to assist in the preparation of the enrollment projections. If additional demographic work is needed, please contact our office.

NESDEC
New England School Development Council
28 Lord Road, Marlborough, MA 01752 ~ Tel: 508-481-9444 ~ www.nesdec.org

REACTIONS?

QUESTIONS ?



WESTPORT PUBLIC SCHOOLS

ELLIOTT LANDON
Superintendent of Schools

110 MYRTLE AVENUE
WESTPORT, CONNECTICUT 06880
TELEPHONE: (203) 341-1010
FAX: (203) 341-1029

To: Members of the Board of Education

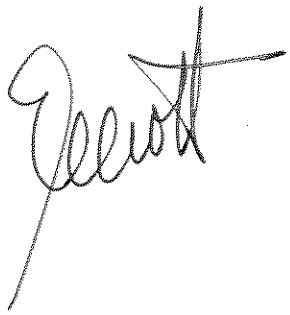
From: Elliott Landon

Subject: Progress Report – National Executive Service Corps Productivity/Efficiency Study

Date: December 1, 2014

The last meeting of the *ad hoc* Steering Committee created by the Board of Education, consisting of Karen Kleine, Brett Aronow, Elio Longo, Marge Cion and Elliott Landon met with representatives of the National Executive Service Corps (NESC) on Wednesday, November 19. The meeting was properly noticed and held in public. At that meeting, the NESC representatives submitted to the Steering Committee the "Summary Results" of their many discussions with representatives of the parental community, the members of the Board of Education, representatives of the RTM and the Board of Finance, and the teachers and administrators of Westport. I have included with this memorandum the listing of the ideas proposed, the rank order of the ideas with weighted scores and related information resulting from that meeting.

The next meeting of the Steering Committee will be held in public session on Monday, December 1 at 9:00 a.m. in Room 307 of Town Hall. I have been informed that Karen and Brett have prepared revisions to the attached document which they will present for the first time at Monday's meeting, but I believe the Board should also see the original document, as it has been shared previously with the public.



Westport Public Schools Productivity and Efficiency Study
Idea Scoring Summary Results

Rank	Idea	Weighted Score	Implementation Difficulty	Financial Size	Short / Long	Notes
1	6. Increase capacity of staff by training in techniques such as "dialectical behavior therapy". (DBT) training to identify students with very risky behavior. NOTE, DBT is used as example, comment idea is broader than just DBT	207	Easy	+	Short	
2	50. Align Middle schools schedules and also share programs where appropriate	194	Moderate	-	Short	
3	52. Reduce the number of goals of WPS as currently none get done well, and this also drives too many meetings and distracts teachers from the time set aside for preparation	180	Easy	-	Short	
4	28. Evaluate the potential of re-districting to better balance the students across the available facilities and to better use the available space in the district	171	Easy / Difficult	+/-	Short / Long	Add 5 year space reqts by building as part of the process - use independent agency to do process - Perhaps re-balance in short term - Includes idea #68
5	37. Keep two grade level directors K- 5 and 6 - 12 rather than add back grade level coordinators at each school (Keep current structure)	170	N/A	N/A	Short	Nothing to act on
6	49. Evaluate the how time is spent by teachers at the H.S. in order to make sure all teachers are utilized to the extent possible under the contract.	166	Difficult	-	Long	
7	86. Seek out grant and private funding opportunities with local banks, businesses, museums, government and private foundations.	161	Difficult	+/-	Short / Long	
8	17. Provide instruction in teacher evaluation process in the spring. Use June for spring – have training done when less urgent	136	N/A	N/A	Short	Action already underway
9	36. Improve the quality of the Spanish teachers at the elementary level	126	Easy	0	Long	Idea is - all Elm Spainish teachers must be certified in Spanish
10	69. Make more of the playgrounds to be more handicapped accessible	123	Moderate	+	Short	Ensure that all playground are accessable appropiate to the population that uses them. Wording - physically disabled - perhaps evaluate conditions of existing playgrounds
11	51. Consistent blocks of time should be created for our special areas classes at the elementary school level. This would allow for more effective scheduling especially when sharing staff with other buildings; provide adequate spacing within block times in the youngest grades to allow better learning focus and provide needed breaks for teachers	112	Easy	-	Short	
12	85. Implement a wellness program	109	Easy	0	Short	
13	91. BOE should streamline the request for information into a regular annual calendar with repeat requests only by exception (structured calendar)	101	Easy	0	Short	Reword to - consolidating requests for info from BOE, and funnel through an individual focal point chair - BOE needs to create the process with administration
14	94. Review current transportation arrangements with a view to improving safety and the effectiveness and efficiency of the routes	100	N/A	N/A	Short	Action already underway
15	66. Restore the elementary building refurbishment fund (maintenance – capital, non recurring, painting, etc.)	99	Moderate	+	Short	Re-establish, refurbishment fund
16	61. Expand the PE instruction in the H. S. to include CPR and life saving skills	96	Moderate	+	Short	Add "hands only" CPR

Westport Public Schools Productivity and Efficiency Study
Idea Scoring Summary Results

Rank	Idea	Weighted Score	Implementation Difficulty	Financial Size	Short / Long	Notes
17	20. PD should only be scheduled on non-teaching days, which would also have the benefit of eliminating the challenge and expense of providing substitute teachers	86	Difficult	-	Long	requires change in contract terms. Example: PD should make use in 20 hours of contract
18	39. Increase number of paraprofessionals in the ELS to increase efficiency	71		+		
19	93. Recommend HR assign someone to pre-screen potential candidates which would make the on-boarding process move quicker and eliminate non value added time spent by Administrators reviewing applications - The current on boarding process delays access of new hires to IT systems	70		+		
20	68. Complete a 10 year space requirement plan adjusted for any changing demographics and new and different requirements such as space for robotics.	66				Included in redistricting
21	87. There should be a dedicated security person @ each building - other than the secretaries, who should not be used as security	61		+		
22	97. Ensure RFQ for bus services includes ability to develop communication capability with email, aps, etc. on status of bus arrivals, etc.	59				Included in other bus one
23	67. Develop a comprehensive facility guideline that describes what the preventative maintenance schedule is for all key assets including building, HVAC, electrical, plumbing, painting etc.	56				Included in refurb one
24	19. Establish a new process to allow participants to rate the effectiveness of PD presentations	55				Underway
25	64. Allow parents to pay for things such as; field trips, yearbook, clothing, lost books, etc. using a credit card instead of checks	53		-		
26	54. Reduce the number of meetings for teaching staff, the excessive number of meetings both reduces effectiveness and level of engagement of the teachers	51				Included PD one
27	57. Eliminate the overlap in responsibilities between Crisis Team Committee, Security Team Committee, Safe School Climate Committee - Combine current crisis and security teams	49		0		
28	70. Carry out an Energy Audit and implement the recommendations; - Immediate opportunities exist such as reduce temperatures in all buildings, pool areas, field house, etc.	47				Underway
29	71. Contract with a company that has expertise in energy conservation to identify cost saving opportunities	36				Underway
30	72. Negotiate a new Energy performance contract that includes more favorable terms	36				Underway
31	16. Enhance the teacher evaluation system by changing the frequency of the observation, providing the necessary background information and orientation earlier in the school year	34		0		Underway
32	15. Use e-textbooks and other electronic teaching and reference materials rather than print (either partially or in total).	28		?		
33	47. Use volunteers (parents and/or members of the community) using a web sites to connect those interested in volunteering. (wide range of capacities - administration, sports, art programs, after school activities, teachers' aids, support staff, tutoring).	27	Difficult	+		
34	12. Implement on-line form technology for all support activities hiring, approvals, PD forms	25				Underway
35	84. For all employees, execute direct contracts for meaningfully discounted hospital services from area wide hospitals	24		?		
36	100. Eliminate bus monitors or replace them with volunteers plus ensure that all buses are fitted with contemporary safety devices	24	Difficult	-		

Westport Public Schools Productivity and Efficiency Study
Idea Scoring Summary Results

Rank	Idea	Weighted Score	Implementation Difficulty	Financial Size	Short / Long	Notes
37	11. Use IT based tools/systems to eliminate paper- based support systems, I.e. eliminate paper forms associated with on boarding, scheduling, personal day forms, general requests and professional development	11				Included in and underway
38	35. Address inequalities in teaching load in contracts. (For example, HS English teachers only teach 4 instead of 5 periods)	8		-		
39	98. Carry out a benchmark study of the transportation of other school systems	6		0		
40	96. Ensure RFQ for bus services includes ability to develop reporting metrics on items such as "on time arrivals", etc.	5				Included in above
41	45. Share with the town the responsibility of managing health care costs and claims processing	3				Not relevant - perhaps wellness program would change
42	78. Evaluate new health care insurance options and contract as appropriate	3				Done
43	44. Share best practices between the school district and the town for HR, IT, Energy, facility maintenance, custodial support for facilities and payroll	1		-		
44	79. Manage workers compensation system internally; implement measures to allow workers to return to work faster	-16		-	Long	
45	31. Reduce the work year of secondary assistant principals from 261 days to either 198 or 208 days to align with the work year of assistant principals at the elementary level.	-20	Difficult	-	Long	
46	74. Review the procedure that means doors are locked for security issues. These locked doors are impeding the normal business flow such as the efficient use of printing facilities	-20		0		
47	92. Develop a comprehensive business plan for Continuing Education with a view to making it a separate profit center.	-21				Underway
48	63. Replace school athletic insurance with parents' own medical insurance and institute an athletic safety program	-21	Moderate	-		
49	73. Implement a forensic audit of facilities to identify potential risks	-25		-		Underway
50	18. Instead of hiring paid outside consultants, use district teachers to deliver the same message and/or allow teachers more input to the selection of PD topics reduce the number of outside consultants used for PD speakers, utilize more in-house expertise	-26		-		
51	5. Eliminate color copying throughout the Westport School system; convert from desk printers to network printers tor reduce the cost of printing. This should be combined with the use of technology to eliminate/drastically reduce printing by implementing electronic distribution	-39		-		
52	27. For qualified students replace last year of HS with special learning (internship) opportunities	-39		-		
53	77. Flowchart the process by which the PTA gives gifts to the school district with the goal of streamlining the activity	-43				change policy to higher limits
54	62. Provide the alternative of opting out of PE in HS if replaced by other extra curricular or sports related activities	-48				
55	25. In early grades - Spanish instead of 3 days a week, move to 2 days a week - and change approach to stimulate enhanced learning of the language	-51				
56	88. Security at schools: ensure all doors have cameras and have security protocols NOT just the front doors of the school	-52				
57	1. Continued participation in tools for schools. Why not every 2 to 3 years, instead of every year?	-54				

Westport Public Schools Productivity and Efficiency Study
Idea Scoring Summary Results

Rank	Idea	Weighted Score	Implementation Difficulty	Financial Size	Short / Long	Notes
58	38. Assess the workload of support staff (Administrator, Secretaries, Guidance Counselors) during the summer – can positions be reduced when school is not in session?	-56				
59	48. Consolidate administrative services (including transportation) with other schools (by either using existing capacity to 'sell' to other schools or decreasing in-house costs by 'buying' the services of another school)	-57				
60	59. Reduce PE at HS from the current 3 year commitment to 2 years. Note: State only mandates 1 year	-61				
61	33. Either eliminate or reduce from 4 to 2 the number of grade level assistants in the H. S	-61				
62	43. Share services between the school district and the town for HR, IT, energy, facility maintenance, custodial support for facilities and payroll.	-63				
63	56. Reduce the frequency of meetings organized by the Director of Curriculum	-64				
64	21. Investigate use of technology and current processes to reduce number of parent requested meetings	-65				
65	76. Flowchart the procurement process with the goal of streamlining it and making it more efficient and productive - current process was reported to be inefficient	-70				
66	13. Use of Technology to facilitate and potentially eliminate some face to face meetings	-71				
67	58. Decrease the frequency of surveys (Safe school climate ,etc.) in order to give time to assess the success of the implementation of previous recommendations	-71				
68	75. Ensure the financial process and supporting IT system allows information sharing at the "manager" level. Enables the budget manager to have visibility of their expense budget - they can possibly retrain	-76				
69	99. Eliminate the need for paid bus parking in Westport	-76				
70	8. To ensure future efficiency and effectiveness of the introduction of BYOD to the High school, make certain that the deployment is fully supported by infrastructure in schools e.g. is there the "bandwidth" to support a greater number of devices.	-78				
71	40. Re-design central office layout to allow elimination of one secretary	-80				
72	42. Outsource maintenance of facilities	-80				
73	89. Eliminate "free dinners" for BOE members at their exec sessions	-81				
74	80. Review the legal costs of the school district to identify potential savings	-84				
75	90. BOE – send out Board packets electronically and save the cost of printing and the courier	-84				
76	7. Develop and implement "business" measures of the success of IT programs – in particular as they support classroom activities by establishing the extent to which IT tools are fully deployed and if the full potential of the tool is fully utilized to improve teacher / staff effectiveness, efficiency and productivity	-89				
77	82. Implement a "fee to join" the covers athletic participation, club participation, etc.	-89				
78	4. Investigate the potential for making classes larger by utilizing technology or utilizing technology for low attendance program	-93				
79	14. Replace platforms that are inefficient - Protraxx (teacher evaluation) and Inform (student data collection	-102				
80	24. Eliminate Spanish in grades K - 2	-104				

Westport Public Schools Productivity and Efficiency Study
Idea Scoring Summary Results

Rank	Idea	Weighted Score	Implementation Difficulty	Financial Size	Short / Long	Notes
81	10. Given the deployment of various technologies including BYOD, initiate a program to make classrooms "paperless" and all information available electronically – utilize the BYOD capabilities – if child wants paper, let printing occur in the home	-105				
82	53. There are too many initiatives, there is no life cycle management of initiatives i.e. plan , implement, assess and sustain	-105				
83	101. Use smaller school busses and reduce the number and closeness of the pickup points	-106				
84	83. Set up aggressive facilities rental policy and promote utilization of facilities 24/7	-111				
85	26. Eliminate Mandarin as a world language offering	-116				
86	30. Review the current structure of the current central office administration by benchmarking it against similar sized school systems	-124				
87	32. Replace one of asst. Principals with colleagues who would focus on coaching and mentoring of teachers	-127				
88	9. Reduce the number of IT devices supplied to the children. Pick one or two, then allow children to bring own approved devices if they don't like provided devices	-138				
89	95. Reassess the need to provide transportation to all student, there should be a distance requirement to qualify for a bus	-143				
90	3. Investigate Low attendance programs (single digit students) to determine value, dropping them	-147				
91	81. Revise the budget process by eliminating the time spent reviewing the line by line cost issues. Flowchart the budget process with the goal of streamlining it and making it more efficient and productive	-149				
92	23. Use private companies to broaden the type of courses available to HS students e.g. electronics, engineering, etc.	-150				
93	55. Flowchart the business processes and introduce metrics that measure the quality (error rate) and efficiency (cycle time)	-153				
94	65. Use school supplies and materials (workbook, sketch pad, etc) in the ELS more effectively and reduce the amount of wasted material	-165				
95	34. Consolidate the number of guidance counselors in the HS. Internet services can make part of existing work load more efficient and productive	-179				
96	2. Cluster certain SPED children in a limited number of school buildings, to enable shared services and optimize the use of space	-181				
97	46. Reduce the number of permanent substitute teachers on the payroll	-182				
98	22. Innovate "think outside the box" curriculum e.g. eliminate all AP courses and use the available resources for more value added activities. - students study for AP on their own, stop teaching just for the test	-189				
99	41. Create opportunities for utilizing volunteer retirees to supplant or replace para-professional staff or bus monitors	-192				
100	60. Reassess the staffing requirements; potentially reduce the staffing levels for Nurses in the High School and psychologists in the Elementary Schools	-223				
101	29. Reduce the number of administrators in the school district	-294				

WESTPORT PUBLIC SCHOOLS

ELLIOTT LANDON
Superintendent of Schools

110 MYRTLE AVENUE
WESTPORT, CONNECTICUT 06880
TELEPHONE: (203) 341-1010
FAX: (203) 341-1029

To: Members of the Board of Education

From: Elliott Landon

Subject: Implementation of SBAC Testing Program and Benefits and Efficacy of Standardized and Advanced Placement Tests

Date: December 1, 2014

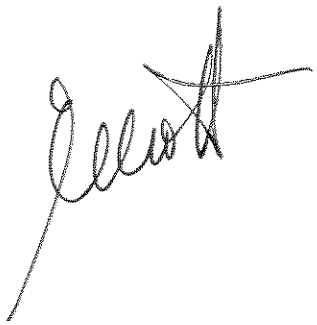
Appended to this memorandum may be found one entitled, "2015 SBAC Testing Program" and a Power Point presentation, prepared for the Board by James D'Amico and Julie Droller in consultation with Natalie Carrignan and our building principals to assist the Board in understanding implementation of the Smarter Balanced (SBAC) Testing Program and the continuation of the CMT and CAPT testing programs in Science.

Also to be found as an attachment is a memo to me from Mr. D'Amico in which he provides a comprehensive analysis of the benefits of continuing to offer Advanced Placement courses at Staples High School.

All of these documents have been prepared in response to the Board of Education Goals-related performance objective and action plan to "analyze required testing (including APs) and test prep to assess their educational benefits and efficacy."

As to matter of benefits of the standardized tests and the Advanced Placement tests, the standardized tests are designed to measure the essential skills necessary for our students to be successful in the global environment they will find themselves upon graduation; to ensure their understanding of the concepts included as part of the Common Core requirements; and, to enable us to measure the success of our curricular development and assessment programs.

With regard to the Advanced Placement testing program, the rationale for continuing and expanding upon that program are evident in the memorandum prepared by Mr. D'Amico.



Julie Droller
Director, Elementary Education
James D'Amico
Director, Secondary Education

TO: ELLIOTT LANDON

FROM: JAMES D'AMICO, JULIE DROLLER AND NATALIE CARRIGNAN

SUBJECT: 2015 SBAC TESTING PROGRAM

DATE: DECEMBER 1, 2104

As of June 2014, Connecticut is one of 46 states that has adapted the Common Core State Standards. These standards define the knowledge and skills students need for college and career readiness in English language arts and mathematics. The SBAC testing includes both computer adaptive assessments and performance tasks for students in grades 3-8 and 11.

Computer Adaptive Assessments:

- assess the full range of Common Core State Standards in English language arts and mathematics
- measures current student achievement and growth across time
- includes a variety of response types

Performance Tasks:

- demonstrate real-world writing and analytical skills
- may include online research and group discussions
- require 1-2 class periods to complete
- are evaluated through the use of consistent scoring rubrics

Using Computer Adaptive Technology:

- provides accurate measurement of student growth over time
- is individualized for each student (timing and level of difficulty)
- provides increased security
- includes fewer questions than fixed form tests
- allows for faster results

We have developed a comprehensive timeline that includes training, preparation, and administration of the SBAC assessments. We have already shared this plan with the administrators and teachers, and have begun our training sessions.

Students will take the practice tests in mid-January, and they will learn to navigate the technology tools and become familiarized with the types of questions and tasks they will be expected to do. The practice tests can be accessed through the following link:
http://sbac.portal.airast.org/practice-test/resources/
Since our curriculum is aligned to the Common Core State Standards, students have been preparing for these assessments since the beginning of the year.

2014 - 2015 SBAC Preparation and Administration Timeline

Task	Elementary	Middle School	High School
Present plan to admin for feedback	Nov. 10	Nov 19 Nov 20	October 30 SHS Admin mtg
Present plan to faculty and BOE	Dec. 1	Dec. 1	Dec. 1
Train SBAC Building Coordinators (and Admins.) via webinar on Tools and Accessibility for All Students	November 25	November 25	December 8
Train teachers on SBAC practice test and performance tasks (and Accessibility for All)	January 16, 2015 (½ day session for all K-5 teachers)	TBD possibly Jan 16, 2015	TBD possibly Jan 16, 2015
Students use practice test and practice performance task 3-4 sessions needed ELA, Math, Performance 2x	Btwn Jan. 17 and Feb. vacation	before Feb. vacation	before Feb. vacation
Students use interim SBAC assessments	TBD (based on availability from state)	TBD (based on availability from state)	TBD (based on availability from state)
Science CMT Gr. 5, 8, and CAPT 10	March 10, 2015	March 10, 2015	March 10, 2015
SBAC Testing	Grades 4 and 5- March 23-April 2 Grade 4: early morning Grade 5: late morning Grade 3- April 21-30 Make-ups until mid-May	Grade 8- March 17-20 Grade 7- March 23-26 Grade 6- March 30-April 2	May 26-29 Make-ups until June 6

Miscellaneous:

- All students on a grade level will take the test at the same time.
- Tests are self-paced; no time limit.
- Students with testing accommodations can have an alternate setting; extra time is unnecessary.
- Keyboarding skills are explicitly taught in grades 2 and 3, and embedded into our instruction and tasks in grades 4 and 5.
- A technology support and preparation plan for each building has been established.
- There is no opt-out. Parents can choose to keep their children out of school on the day of the test, however we are obligated to administer the test as soon as the student returns to school

Parent communication:

- A Parent Information session will be held in January during the day and in the evening.
- Each Principal will schedule follow-up PTA coffees in their individual schools

SBAC Testing Program

Smarter Balanced Assessment Consortium

Implementation Report
December 1, 2014
Westport Board of Education

Tested Subjects 2014-15

- Science
  - CMT in grades 5 & 8
  - CAPT in grade 10
    - Making goal still required for graduation
- Reading, Writing, Math
  - SBAC in grades 3-8, 11
  - New system, new schedule, new challenges

Testing Comparison

CMT/CAPT

- Paper and Pencil
- Fixed time blocks for each test
- Identical test for all students

SBAC

- Computer based for all students
- Self-paced, no time limit
- Adaptive test
- Based on Common Core State Standards

Transition to SBAC

Short-term

- Elimination of extended-time/ modified assessments
- Technology management
- Parent Information Sessions
  - January 7th, evening
  - January 8th, daytime

Long-Term

- Dates chosen now should remain consistent in the future
- Curriculum adaptation and development

Testing Dates 2014-15

- Science CMT/CAPT
  - Scheduling date chosen by district
  - **March 10, 2015** in all tested grades
  - Preparation remains the same
- SBAC
  - State testing windows
  - Grades 3-8 open March 17
  - Grade 11 opens April 27

Anticipated SBAC Schedule

Elementary Schools	Middle Schools	High School
Grade 4 & 5 **March 23-April 2** **Grade 4** Morning, ~1.25 hours **Grade 5** Late Morning, ~1.25 hours	**Grade 8** **March 17-20** Morning, ~2 hours	**Grade 11** **May 26-29** Morning, ~2 hours
	Grade 7 **March 23-26** Morning, ~2 hours	
Grade 3 **April 21-30** Morning, ~1.25 hours	**Grade 6** **March 30-April 2** Morning, ~2 hours	

*times are approximate, will be determined by building administrators

Scheduling Considerations

Elementary Schools

- Equipment availability
  - Can accommodate one grade level at a time
- Create shorter testing blocks for students
- Give third grade more lead time
  - Instruction based on standards
  - Prepare students for test

Scheduling Considerations

Middle Schools

- Equipment Availability
  - Can accommodate a whole grade level with laptops
  - Have labs available for other grade levels
- Sustainable testing windows
  - Give grade 6 more instructional time
  - Condense testing window for grade 8
- Keep testing in the morning
  - Consistent scheduling of specials

Scheduling Considerations

High School

- Student stress and preparation
  - Leave a week in between AP exams and SBAC
  - Leave at least a week in between SBAC and final exams
- Maximize instructional time
  - With seniors out on internship, more space and proctors available
  - Can schedule without delayed opening
  - Increased instructional time for 9th and 10th graders

Preparing Staff for SBAC

- Building testing coordinators trained
  - November 25 → December 8
- Teachers review/learn about resources
  - SBAC practice tests, performance tasks, rubrics
  - SBAC interim assessments (anticipated)
- Tech department prepares equipment

Preparing Students for SBAC

- Practice Tests & Sample Performance tasks
  - Between January 17 and February break
  - All tested grade levels/subject areas
- Interim Assessments
  - When available between January 17 and beginning of testing window
- Keyboarding Practice
  - Pre-assessed in school (grades 4-8)
  - At-home practice resources
  - Formal in school instruction and practice for grade 3

A Note on "Opt-Outs"

- There is no provision for students opting out of the test
- Students who are absent for any reason will have to sit for the tests when they return to school
- Best option for school system's standing, reputation, and future students is for all students to attend and try their best

Smarter Balanced
Assessment Consortium

Questions?

WESTPORT
W
PUBLIC SCHOOLS
18 36

James D'Amico
Director of Secondary Education

TO: Elliott Landon
FROM: James D'Amico
SUBJECT: Benefits of Advanced Placement Courses
DATE: December 1, 2014

In recent years, the efficacy and benefit of offering Advanced Placement courses has come under close scrutiny by students, parents, and educators. Some schools have chosen to remove or reframe offerings at this level, bucking the trend of AP course expansion at most American high schools. At Staples High School, we have continued to offer AP coursework as an option to our students in addition to the other rich offerings that are offered.

Staples High School currently offers twenty-two Advanced Placement course options for our students. These courses are offered across all disciplines, allowing students to choose high-level coursework in areas that they are skilled in and passionate about, not only to fill required graduation courses.

There are clear, measurable benefits to offering students the choice to participate in AP coursework. With college admissions counselors trying to make sense of applicants from the over 19,000 public high schools in the United States, AP courses remain an important indication to admissions officers that a student who has taken an AP course and scored a "3" or higher on the end of course exam has undertaken the most rigorous classes their high school has to offer. In 2012, it is estimated that over 750,000 students submitted over 3,000,000 applications to universities in the United States. In an increasingly competitive admissions environment that our graduates face, this is important information to communicate to prospective colleges.

Performance on AP exams also carries potential benefits for high school graduates. Students can earn credit for college coursework, often including introductory level courses at the university level, that can open up possibilities for them. We can look to examples right here in Connecticut to see the potential benefit to students. The University of Connecticut, a Top-20 national public university and the top public university in the northeast, awards credit for 32 AP exams with a score of 4 or higher, one with a score of 5, and one with a score of 3. The benefits of high achievement on AP exams is not limited to public universities. World-renowned Yale University grants credits for a score of 4 or higher on 10 different AP exams, and for a score of 5 on 6 other exams.

As you are aware, Staples students perform extraordinarily well on these exams. Last year 533 Staples students took 1,133 AP exams, and 92% of those exams were scored at a "3" or higher. It should be noted that while some schools prevent students from taking AP courses, all Staples students have access to AP courses either through teacher recommendation or parental override, as long as they have met the prerequisite course requirement.

This is not to say that AP courses are perfect. The College Board has been revamping almost the entire scope of its offerings to emphasize critical thinking and problem solving over memorization of content in response to criticisms from educators and students from both secondary and higher education. Some educators also question whether AP courses really prepare students for the rigor of college classes, given the wide differences in high school and university learning environments.

Certainly student anxiety and stress, including perceived pressure to load up on AP courses, are issues not unknown to Westport. We are vigilant in helping students make health choices when it comes to balancing schoolwork and their extracurricular and personal activities.

As we engage in continuous improvement of our curriculum, all programs, including Advanced Placement course offerings, are always on the table for discussion in terms of benefit to students and alignment with our mission. At the present time, AP courses offer a large benefit to Staples High School students, and remain an important piece of our curriculum moving forward.

References:

https://apstudent.collegeboard.org/creditandplacement
https://apstudent.collegeboard.org/exploreap/the-rewards
http://nation.time.com/2013/05/01/as-college-applications-rise-so-does-indecision/
Standardized Testing Report, Westport Public Schools, October 2014

Julie Droller
Director, Elementary Education
Telephone: 203-341-1213
Email: jdroller@westport.k12.ct.us

TO: ELLIOTT LANDON

FROM: JULIE DROLLER

SUBJECT: KINDERGARTEN PROGRAM RECOMMENDATIONS

DATE: DECEMBER 1, 2104

At the June 9, 2014 Board of Education meeting last spring, Cynthia Gilchrest and the elementary principals reported on the success of our 5 Full Day Kindergarten Program Initiative. The presentation included recommendations to consider for the 2014-2015 and 2015-2016 school years, which we will be reporting on this evening.

Update on our recommendations for 2014-2015:

- Plan to check-in/feedback from kindergarten and 1st grade teachers
- Increase paraprofessional time in kindergarten

Program recommendations for 2015-2016:

- Increase music from one 30-minute class to two 30-minute classes per week for our kindergarten students

Included with this letter is a Kindergarten Music Proposal prepared by Thomas Scavone, K-12 Supervisor of Music. Mr. Scavone outlines a determination of need, his recommendation, an impact analysis, timeline for implementation, and a comparison of Kindergarten music times for our DRG and other high performing districts. He will join me and the elementary principals to discuss this recommendation.

The impact of an additional 30-minute music class per week on instructional time in kindergarten is five minutes per day, which will be absorbed through revised social skills and social studies curriculum and improved teacher efficacy at implementing the balanced literacy framework.

Kindergarten Music Proposal

Thomas A. Scavone
K-12 Supervisor of Music

9/30/2014

Introduction:
The Westport Public Schools music program is highly regarded both locally and nationally. As evidenced by our designation as a national Best Communities for Music Education since 2012, we are in the enviable position of being considered among the best. It is the primary responsibility that programs of excellence continually evolve through a combination of quality instruction, the implementation of best practices and through a self-assessment process using nationally-recognized, subject-specific benchmarks. These efforts align with Westport's goal of continuous improvement in the areas of instruction, curriculum and assessment.

Determination of Need:
One of my first charges was to review the delivery of elementary music instruction to determine if students were receiving appropriate contact time, specifically at the Kindergarten level. Westport is below recommended minimums for Kindergarten music instructional time as outlined in both the state and national opportunity-to-learn standards which recommend between 60 and 100 minutes. We currently provide 30 minutes of kindergarten instruction once a week. At every other elementary grade level, we are within the guidelines.

An articulate, well-sequenced music curriculum must deliver quality instruction taking into account two primary considerations: frequency of class instruction and total instructional time. This is especially important at the early grades. Our elementary music curriculum is diverse, providing musical experiences through varied activities such as singing, singing games, movement, folk dance, and playing both rhythmic and melodic instruments. It concentrates on music understanding, appropriate skills and appreciation for the many forms of music, and seeks to enrich the lives of all students. A single 30 minute class per week presents a number of instructional challenges including:

- reinforcement and retention of concepts and skills
- the ability to accurately assess student progress
- the possibility of weeks passing without instruction due to factors out of the teacher's control including weather cancellations and student absence
- integration and assessment of movement (kinesthetic) in the development of the whole child
- the ability to address the goals and expectations of the recently released National Core Arts Standards for Music which states that in addition to the three artistic processes that have driven our instruction: Creating, Performing and Responding (CPR); a fourth, Connections, focuses on the higher-order skills of synthesizing and relating knowledge to CPR

An inadvertent consequence of the current construct is that music literacy skills that are expected to be introduced at the Kindergarten level are pushed into the upper elementary grades. The addition of instructional minutes must be coupled with an increase in frequency of classes. Increasing time to 45 minutes or more in a single class session is not recommended by the Connecticut Department of Education (*Components of an Effective Arts Program).*

Recommendation

Kindergarten music instruction should be delivered through two 30 minutes classes per week for a total of 60 minutes. This year, we are investigating best practices for our Pre-K and Kindergarten music instruction through a combination of Professional Development opportunities. I would recommend that we continue to focus department PD and meeting time on this topic with the goal of developing a comprehensive Kindergarten curriculum aligned to the new National Standards.

Impact Analysis

- **19** - Total Kindergarten Classes District-wide (based on 2014-15)
- **345** - Total Kindergarten Students Impacted (based on 2014-15): CES - 50; GF - 57; KHS - 82; LL - 70; SES - 86
- no more than **+ .5 FTE** - Staffing Needs (this year, music FTE was reduced by .2 FTE)
- Other Budget Implications (i.e. additional supplies) - None
- Scheduling - Principals identified no foreseeable issues except for possible conflicts with KHS' APE and specialized programs
- Facilities - Principals identified no additional facility issues except for possible coordination of music classes at LLS

Timeline for Implementation

- **September - October 2014**
  - Meet with elementary music staff, principals and District Administrators to develop a detailed proposal/impact study
- **November - December 2014**
  - Submit proposal for adoption into the 2015-2016 Budget requests
- **January - June 2015**
  - Determine Scheduling and Facility needs for each building
  - Revise Kindergarten curriculum and assessments
  - Hire appropriate staff
- **August 2015**
  - Begin Instruction

Music Education Philosophy of the Westport Public Schools

To ensure that each child in Westport will create music, perform music, and respond to music with understanding, develop in-depth skills in music, appreciate the importance of music in expressing human experiences, and apply their musical knowledge and skills to make educated musical judgments throughout their lifetimes.

We know that a quality, sequential music education helps students learn to communicate beyond the obvious, appreciate beauty and expression beyond the limits of pop culture, develop powers of concentration and focus, become better citizens, and helps students to know themselves better through enriched lives and experiences.

Kindergarten Music
DRG A and Comparable Schools (Best Communities Designees)

District	Contact Time
Darien	**2** forty minute classes per 6 day cycle
New Canaan	**2** thirty minute classes per 6 day cycle
Region 9	No response
Ridgefield	**1** thirty minute class per week
Weston	**2** thirty-minute classes per week
Westport	**1 thirty minute class per week**
Wilton	**2** thirty minute classes per week
Schools with comparable music programs	
Canton, CT	**2** thirty minute classes per week
Fairfield, CT	**2** thirty minute classes per week
West Hartford, CT	**2** thirty-minute classes per week
Lexington, MA	**2** thirty-minute classes per week
Scarsdale, NY	**2** thirty-minute classes per 6 day cycle

Respectfully Submitted,

Thomas A. Scavone

TEACHING TIP

LET'S BRING BACK THE MAGIC OF SONG FOR TEACHING READING

Becky Iwasaki ▪ Timothy Rasinski ▪ Kasim Yildirim ▪ Belinda S. Zimmerman

In most primary classrooms in the United States, reading instruction is increasingly dominated by literature (chiefly stories) and informational texts. Recent calls for reading curriculum reform continue to note the primacy of literature and informational texts (Dorfman & Capelli, 2007; Flowers & Flowers, 2009; Spencer, 2011).

Yet a considerable amount of language activity we engage in as adults involves rhythmical words such as songs. Perhaps it is singing in places of worship, or the beginning of a sporting event, or singing along to the radio while driving, or just listening to one's ipod while walking in the neighborhood. If during these singing episodes we were provided with the written lyrics to the songs, we would be reading!

We think that singing (while simultaneously having a visual display of the words in the songs) could be a very useful instructional tool to teach reading to beginning readers. A growing body of research and scholarly thought suggests that singing has potential for improving reading (Biggs, Homan, Dedrick, & Rasinski, 2008; Fisher, 2001; Harp, 1988; Hines, 2010; Miller & Coen, 1994; Smith, 2000). For example, Biggs and colleagues (2008) found that the regular repeated singing and reading of songs by struggling middle school readers over a nine-week

Becky Iwasaki is a first-grade teacher at South Street School in Danbury, Connecticut, USA; email iwasar@danbury.k12.ct.us.

Timothy Rasinski is a professor of reading education at Kent State University, Ohio, USA; email trasinsk@kent.edu.

Kasim Yildirim is an assistant professor of elementary school classroom teaching department at Mugla Sitki Kocman University, Turkey; email kasimyildirim@mu.edu.tr.

Belinda S. Zimmerman is an assistant professor of reading education at Kent State University, Ohio, USA; email bz4literacy@yahoo.com.

 DOI:10.1002/TRTR.1203

"A considerable amount of language activity we engage in as adults involves rhythmical words such as songs."

period resulted in significantly greater progress in reading achievement (seven months gain on average) than a comparison group of students in an alternative intervention.

When students sing while tracking the lyrics to songs, they are in essence reading. Singing increases time spent reading. Scholarly thought in literacy suggests that the more reading young readers do, the better readers they will become (Allington, 2002; Morgan, Mraz, Padak, & Rasinski, 2008). The joyfulness embedded in singing may motivate students to want to sing (and read) even more.

Certain features are embedded in songs that make that them memorable and enjoyable. First, the melody and rhythm of songs makes them easy to learn and easy to remember. One of our goals for beginning readers is to develop a robust sight vocabulary. Sight words are essentially memorized words—by sight and sound. The memorability of the words in songs offers good opportunities for developing young students' sight vocabulary.

Song lyrics (a form of poetry) often are embedded with rhyme, assonance, and alliteration. This playing with the sounds of language through song can be a gateway to the development of phonemic awareness. The rhyming nature of most song lyrics also provides teachers with excellent texts for teaching word families (rimes). When we work on the "-ob" word family, we are sure to teach students "When the red red robin comes bob, bob, bobbing along."

Songs lend themselves to repeated reading, a research-tested method for developing reading fluency (Samuels, 1979; Therrian, 2004). How many of us hear a song in the morning and find ourselves singing it all day long? The repetitious nature of singing (choruses are sung repeatedly in a song) provide opportunities for improving students' reading fluency. Moreover, the melodic nature of songs requires the singer/reader to attend to the prosodic nature of the lyric. Prosody is often the part of reading fluency that is ignored (Dowhower, 1994).

Finally, songs are "a natural way to get children to pay attention to rhymes and a fun way to learn" (Temple, Ogle, Crawford, & Freppon, 2010, p. 116). In essence, the brevity, melody, rhythm, and other features of songs and song lyrics make them easy to learn. Many first graders encounter frustration when they are unable to fluently read lengthy texts. The ability to sing and read a song lyric is an accomplishment that could improve young, struggling readers' confidence in their ability to read.

A Year of Singing

In the 2011–2012 school year, Becky (first author) decided to bring song back into her first-grade classroom by teaching her students one or two new songs each week. As students sang throughout each week she reminded them to track the words—to read as they sing. Eighteen of Becky's students began and ended the year with her and were assessed using the Developmental Reading Assessment (DRA; Beaver, 2012) in September and May. Results of the DRA suggest that all but one of her students made at least a year's growth in reading, and several students exhibited greater than average reading growth.

We acknowledge that we cannot attribute Becky's success solely to the fact that students sang regularly in her class. In classroom-based research, because students receive a variety of forms of instruction, it is nearly impossible to specify an exact cause to any one instructional approach. Yet Becky's results appear to be in line with other scholarship (noted earlier) that supports singing in the classroom.

Reading rhythmical language in the primary grades is not new. Teachers have been singing with students since the days of the McGuffey Reader. However, the recent emphasis on narrative and informational reading has led to a decline in this type of reading (Gill, 2007). Sometimes, perhaps, to go forward in reading instruction, we need to take a look backward at where we have been.

Becky's Singing Classroom

Each week Becky taught her students one or more songs, mostly children's songs. Deciding factors for Becky's song

"All but one of [Becky's] students made at least a year's growth in reading, and several students exhibited greater than average reading growth."

selections included those with distinct melodies, simple and regular rhythm, and lyrics that easily fit the melody and rhythm structure and could easily be learned and sung by children. Of course, Becky chose songs that had content that was appropriate for primary-grade students. Becky found most of her songs online and on CD collections of songs for children. Samples of songs she taught her first graders included "You Are My Sunshine," "Yankee Doodle," "Miss Mary Mack," "This Little Light of Mine," "Take Me Out to the Ballgame," "Red Red Robin," "We Shall Overcome," and "A Tisket, A Tasket."

Although Becky attempted to choose songs that tied into a particular curriculum theme or time of year (holiday songs in December; "Take Me Out to the Ballgame" at the beginning of baseball season), most often she chose songs that she felt children would enjoy singing. Several websites (e.g., www.theteachersguide.com/ChildrensSongs.htm) provided Becky with a compendium of songs for children as well as ideas for connecting songs to curricular themes.

Here's a typical weekly routine Becky used for teaching "You Are My Sunshine" to her students. Becky spends approximately 10–15 minutes each day on singing with her students.

Day 1

- "You Are My Sunshine" is playing as students arrive to acquaint students with the melody and words. Some students call out, "I know this song!" While students listen to the song played several times, the lyrics are charted in front of them. As Becky and her class sing the song several times throughout of the day, often during transition times, Becky points to the words in the charted lyrics to draw students' attention to the written words.
- Becky leads her class in a discussion talk about what the song means: "What is this song teaching us?" Some students think it teaches us about sunshine. Some note that it's about love. Becky asks, "Who do you think the sunshine is in this song?" One student notes that it is about a person singing to someone he or she is in love with. Becky asks students to think of other words they know that might refer to love besides *sunshine*. Students respond with *honey, dear, cutie, baby,* and *sweetie*. Becky writes these on a chart entitled "Words of Love."
- Next Becky directs students to find words they know in the lyrics. Many are already displayed on the word wall: *you, are, my, some, know, happy, make, take.*
- Each student receives a personal copy of the song and illustrates it. In the following days, Becky will ask students to read the words from their own copies as they sing. Students take home their copy of the song and sing it to and with their parents several more times.

"The repeated readings [of song lyrics] allowed even the less proficient readers to develop a mastery of the songs that was equal to the more advanced students."

Day 2

- "You Are My Sunshine" is playing as students arrive. The song lyrics are still on display, and many students gravitate toward them. Most students recall the song from the previous day and offer personal comments such as, "I love this song," or "My mom sang this to me last night." Becky asks how many students sang the song the previous night at home. All hands go up!
- Becky and her students sing the song chorally from the chart and from their own personal copies. Becky reminds students to look at the words on the chart as they are sung. She or a student points to the words as the class sings.
- Becky asks her students to call out more words from the song that they recognize. Any new words that students recognize, such as *sunshine* and *gray,* are added to the word wall.
- Many teachable moments arise from the discussion of the words. Becky notes the compound nature of *sunshine*. She also points out to students rhyming words, words that begin or end with a particular letter or sound. And she shows students how the "-ay" word family in *gray* appears in other words such as *day, say, stay, may,* and *bay.*
- The brief discussion is followed by students singing the song again in varied forms—boys only, girls only, slowly, quickly, and so forth. Again, Becky asks students to share what they think the song might be about. One child notes that it may be about a mom singing about her child. At various times during the

"The beauty of singing in the classroom is its simplicity and joyfulness. Songs are everywhere."

day Becky leads her students in a rendition of the song.

Day 3

- Students enter the classroom in the morning with the song playing. Many children sing along as they hang up their coats and ready themselves for the day.
- Becky begins the day by asking students to sing along with her.
- Next she draws students' attention to particular words such as *sun* from *sunshine*. She asks students to think of other words that rhyme with *sun* and contain the "-un" word family. Students call out *fun, bun, run,* and Becky displays the words on the dry-erase board.
- Becky asks students to work in small groups and think of words that contain the "-ake" word family and other words besides *gray* that begin with *gr-*. After a few minutes of work, students call out their responses, and Becky charts the words on the dry-erase board.
- Students chorally read the words they have brainstormed and end with one or more renditions of the song.

Day 4

- As in previous days, the day begins with students and Becky singing their song together. Students sing as a whole group and in smaller groups.
- Becky asks students to share their favorite parts of the song and to read the lines (or words) they love most. She asks students to explain their choices.
- The song is sung throughout the day.
- At the end the day, Becky asks students to write in their journals their feelings about learning "You Are My Sunshine."

Day 5

- The school day begins with one or two renditions of "You Are My Sunshine." By now nearly all students are able to sing the song, read the song fluently without the melody, identify words from the song in isolation, and identify related rhyming words.
- The principal, always an appreciative audience, is invited to the classroom to hear the class sing and read.
- Later that morning, students sing to one or more kindergarten classes. Throughout all the singing, students have visual access to the lyrics, either through the charted lyrics or students' own copies of the lyrics. Becky regularly reminds students to "look at the words as you sing," even though many students are quite proud at having memorized the lyrics.

Each week a new song (or songs) was taught and rehearsed in a similar manner. As songs were mastered, they are added to students' song and poetry binders, and as her class's repertoire of songs increased, her class frequently reprised songs previously learned. One way to make the singing experience authentic and motivating was to provide a listening audience. Becky's class often took its "show" on the road by visiting and performing for other classes and inviting parents, principal, and other school staff to visit her class for a performance. During monthly school literacy celebrations, Becky's students were often asked to perform songs from their repertoire to parents and other audiences.

Because of the motivational nature of singing, students were willing to engage in repeated reading of the songs throughout the week until all students could read/sing the song fluently. Although the students in her class reflect a range of differences in reading achievement, the repeated readings allowed even the less proficient readers to develop a mastery of the songs that was equal to the more advanced students. Singing allowed all students to participate at a proficient level.

Word study was a big part of the song instruction. Becky often chose words for further study and display on the classroom word wall that were exemplars of word families and other phonics elements the class was studying, high-frequency words that she felt students should learn to recognize automatically, or words that she and her students felt were interesting or unusual and worth exploring in greater detail.

Your Turn

If Becky can bring singing back into her classroom, you can too. The beauty of singing in the classroom is its simplicity and joyfulness. Songs are everywhere. We hope that Becky's story will inspire you to bring more singing into your own classroom. Teach your children a

new song every week. Be sure to have the written lyrics available for students to read. Sing the same song repeatedly (repeated reading) until they are able to sing the song fluently. Then have your students perform for an audience. What could be better—children having fun singing while learning to read at the same time!

REFERENCES

Allington, R.L. (2002). What I've learned about effective reading instruction from a decade of studying exemplary elementary classroom teachers. *Phi Delta Kappan, 83*(10), 740–747.

Flowers, T.A., & Flowers, L.A. (2009). Nonfiction in the early grades: Making reading and writing relevant for all students. *Journal for the Liberal Arts and Sciences, 13*(2), 40–50.

Beaver, J., & Carter, M. (2012). *Developmental Reading Assessment* (2nd ed.). Upper Saddle River, NJ: Pearson.

Biggs, M., Homan, S., Dedrick, R., & Rasinski, T. (2008). Using an interactive singing software program: A comparative study of middle school struggling readers. *Reading Psychology, An International Quarterly, 29*(3), 195–213.

Dorfman, L.R., & Capelli , R. (2007). *Mentor texts: Teaching writing through children's literature, K-6.* Portland, ME: Stenhouse.

Fisher, D. (2001). Early language learning with and without music. *Reading Horizons, 42*(1), 39–49.

Gill, S.R. (2007). The forgotten genre of children's poetry. *The Reading Teacher, 60*(7), 622–625.

Harp, B. (1988). When the principal asks: "Why are your kids singing during reading time?" *The Reading Teacher, 41*(4), 454–456.

Hines, S. (2010). Name that word: Using song lyrics to improve the decoding skills of adolescents with learning disabilities. *Teaching Exceptional Children, 43*(1), 16–21.

Miller, A., & Coen, D. (1994). The case for music in the schools. *Phi Delta Kappan, 75*(6), 459–461.

Morgan, D., Mraz, M., Padak, N., & Rasinski, T. (2008). Independent reading: Practical strategies for grades K-3. New York, NY: Guilford.

Samuels, S. J. (1979). The method of repeated readings. *The Reading Teacher, 41*(4), 756–760.

Smith, J.A. (2000). Singing and songwriting support early literacy instruction. *The Reading Teacher, 53*(8), 646–649.

Spencer,T. (2011). Learning to read in the wake of reform: Young children's experiences with scientifically based reading curriculum. *Perspectives on urban education, 8*(2), 41–50.

Therrien, W.J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education,25*(4), 252–261.

MORE TO EXPLORE

Websites for Finding Folksongs and Songs for Children

- www.theteachersguide.com/ChildrensSongs.htm
- www.niehs.nih.gov/kids/music.htm
- www.songsforteaching.com
- www.contemplator.com/america/
- www.scoutsongs.com/categories/patriotic.html

WESTPORT PUBLIC SCHOOLS

ELLIOTT LANDON
Superintendent of Schools

110 MYRTLE AVENUE
WESTPORT, CONNECTICUT 06880
TELEPHONE: (203) 341-1010
FAX: (203) 341-1029

To: Members of the Board of Education

From: Elliott Landon

Subject: Acceptance of Gift

Date: December 1, 2014

The Westport Schools Permanent Art Collection (WSPAC) has been a part of our school system for many years and has brought hours of joy and appreciation to students, staff and parents in all of our schools from pre-Kindergarten to Grade 12.

In celebration of the 50th anniversary of the beginning of this extraordinary collection of professional art, Julia and Greg Hubert of the Hubert Gallery in New York City are contributing thirty-two major pieces of art to the existing collection to include 30 fine art prints and one oil painting with the value of these works estimated at $69,000.

Additionally, Patricia Colgan Davis has contributed a Steven Dohanos signed offset lithograph illustration valued at $250; Paula Schooler a Harold Von Schmidt gouache painting valued at $2500; and, Mary Ann Neilson, two of her botanical watercolors valued at $1200.

This expansion of the collection will bring added joy to the students, staff and parents who are involved with our schools.

ADMINISTRATIVE RECOMMENDATION

Be It Resolved, That upon the recommendation of the Superintendent of Schools, the Board of Education accepts with great appreciation multiple gifts of art works contributed by Julia and Greg Hubert, Patricia Colgan Davis, Paula Schooler, and Mary Ann Neilson, with a total value of $74,150.

westport schools art collection | a museum without walls

Established in 1964, and unveiled in 1965, the Westport Schools art collection is a unique educational and community resource, and fifty years later, the artwork is still on view in the hallways and offices of our schools and town buildings so our schoolchildren can see them everyday. Greta strides are being made to make the collection a resource to support local curricula and classroom projects, with technology, direct access to the database as well as new donations that support these areas. It is with pleasure that I offer the following gifts--35 works of art-- for acceptance by the following four donors:

Patricia Colgan Davis
34 Woods Grove
Westport CT 06880

Donation
Stevan Dohanos, *Pharmaceutical Antiques*, Cover of *Medical Times* magazine, 1973;
Value: $250

Patricia Colgan Davis is donating this signed offset lithograph (illustration attached) by famed Westport artist Stevan Dohanos, in honor of Anne and Joe Colgan of Westport CT. It was a gift of artist to the family in appreciation for loaning pharmaceutical antiques for this still life. Colgan Pharmacy was located in downtown Westport, where Tiffany & Co. is now located; they sold the business to Colonial Pharmacy.

Paula Schooler
44 Drumlin Rd
Westport, CT 06880

Donation
Harold Von Schmidt, *Forlorn Island, Part IV*; Value: $2,500

Harold Von Schmidt was among the nationally known illustrators who came to Westport in the early 1900s. He was famous for his western scenes and book illustrations. This gouache painting (see attached) appeared as an illustration in Part IV of the Historical Fiction and Sea Adventure by Edison Marshall, titled *Forlorn Island* (H.C. Kinsey, 1932). The inscribed caption reads, "He jerked her headlong through the air into his arms. Thunder rattled in her ear-a passing wind raised the hair on her head.'" The scene depicts the moment when Eric Ericssen becomes the first officer on the ill-fated luxury yacht, the Intrepid. He commissioned himself to save the lives of the passengers from a shipwreck, to preserve them from starvation, murder, and mutiny upon a forlorn island in the Aleutians, and to win the love of a beautiful but unyielding girl.

Note: The murals by his son, Eric Von Schmidt, hang in the lobby of the SHS auditorium

westport schools art collection | a museum without walls

Mary Ann Neilson
5 Daybreak Lane
Westport, CT 06880

Donation:
Rosa, Gurs an Aachen; value $1200
Rosa Curly Pink; value $1,200

Connecticut artist Mary Ann Neilson has donated two of her botanical watercolors to the collection, which are illustrated on the attached document. The botanical painting-- portraits in bloom as she calls them-- have been featured in publications about art and illustration and her paintings are included in the collection at the Brooklyn Botanic Garden, a garden where Mary Ann taught for nine years. Neilson says of her botanical watercolors, "in their very essence are 'portraits' of plants. To me, portraits of plants and people hold in common, the dual challenge of creating a likeness and expressing their spirit in being 'alive'. About the artist, http://maneilsonfineart.com/about

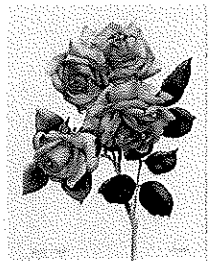
Julie and Greg Hubert
115 East 82nd Street
New York, NY 10028

Donation
30 fine art prints and 1 oils painting, total value: $69,000.00
Complete illustrated list attached. Individual values range from $250 to $8,500

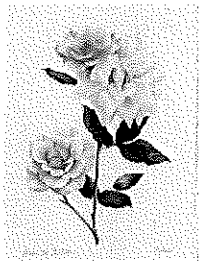
In 2011 print collectors and gallery owner Greg Hubert (http://www.hubertgallery.com) and his wife donated seven Henri Matisse lithographs from the French portfolio "Poesies Antillaises" by John-Antoine Nau. Several of these beautiful proofs now hang in the SHS World Languages Department and have been hung at BMS as well. In honor of the collections' 50th anniversary (2014/15), the Huberts are making a significant donation of 30 fine art prints (lithographs, etchings, engravings) and one oil painting by American and European 19th and 20th century artists in tribute to the late Burt Chernow's founding vision for a "museum without walls" and for works of art to surround and be part of students' cultural education. These beautiful and stunning works are rich is imagery, humanities themes and subject matter, and can be employed in classrooms of Art, Social Studies, English and World Languages, and be enjoyed on their own by staff and students and their families.

Westport Schools Permanent Art Collection

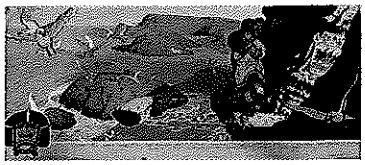
ID	1692
Artist	Dohanos, Stevan
Title	Pharmaceutical Memorabilia
media details	lithograph
Size	19" x 18"
Value	$250
Signature Pos.	lower right
Dated	1973
Acq. History	gift of Patricia Colgan Davis (daughter of Anne & Joe Colgan) 34 Woods Grove, We



ID	1737
Artist	Neilson, Mary Ann
Title	Rosa, Curly Pink
media details	watercolor
Size	
Value	$1,200
Signature Pos.	
Dated	1999
Acq. History	gift of the artist, Mary Ann Neilson, 5 Daybreak Lane, Westport, CT (203) 858-6098

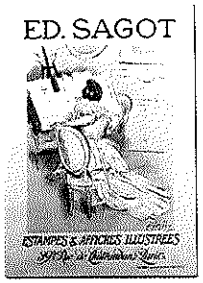


ID	1738
Artist	Neilson, Mary Ann
Title	Rosa, Grus an Aachen
media details	watercolor
Size	
Value	$1,200
Signature Pos.	
Dated	1999
Acq. History	gift of the artist, Mary Ann Neilson, 5 Daybreak Lane, Westport, CT



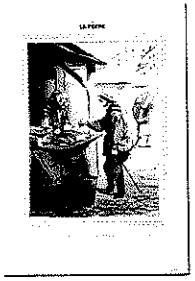
ID	1696
Artist	Von Schmidt, Harold
Title	Forlorn Island, Part IV
media details	gouache and watercolor on Bainbridge illustration boar
Size	37 " x 22-1/8"
Value	$2,500
Signature Pos.	lower right HAROLD/V
Dated	June 1932
Acq. History	gift of Paula Schooler, 44 Drumlin Rd. Westport, CT

ID 1739
Artist Helleu, Paul Cesar Francois
Title Ed. Sagot
media details lithograph in colors
Size **Value** $1,000
Signature Pos. **Dated** circa 1901
Acq. History Provenance: Hubert Gallery, New York City



ID 1740
Artist Daumier, Honore
Title Un Pecheur endurci
media details lithograph
Size **Value** $700
Signature Pos. **Dated** circa 1840
Acq. History Provenance: Hubert Gallery, New York City

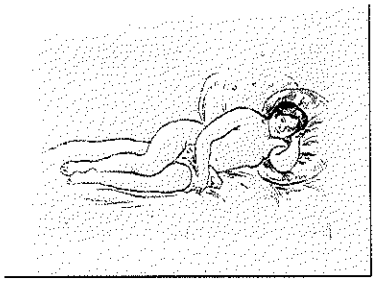
ID 1741
Artist Daumier, Honore
Title *C'est presque toujours à la halle que les pêcheurs*
media details lithograph
Size **Value** $700
Signature Pos. **Dated** circa 1840
Acq. History Provenance: Hubert Gallery, New York City



ID 1742
Artist Daumier, Honore
Title *Le Pecheur Acharne, ou il ne faut pas disputer les*
media details lithograph
Size 6.3" x 8.66" **Value** $700
Signature Pos. **Dated** circa 1840
Acq. History Provenance: Hubert Gallery, New York City

ID 1743
Artist Renoir, Pierre-Auguste
Title *Le Chapeau Epingle*
media details etching
Size 20" x 16-3/8" **Value** $1,500
Signature Pos. **Dated** circa 1894
Acq. History Provenance: Hubert Gallery, New York City

ID 1744
Artist Renoir, Pierre-Auguste
Title *Femme nue couchée (tournée à droite)*
media details etching
Size 10" x 13-1/8" **Value** $1,500
Signature Pos. **Dated** circa 1906
Acq. History Provenance: Hubert Gallery, New York City



ID	1745
Artist	Renoir, Pierre-August
Title	*Sur la Plage, à Berneval*
media details	etching
Size	10-3/4" x 9-1/8"
Value	$1,500
Signature Pos.	
Dated	circa 1892
Acq. History	Provenance: Hubert Gallery, New York City

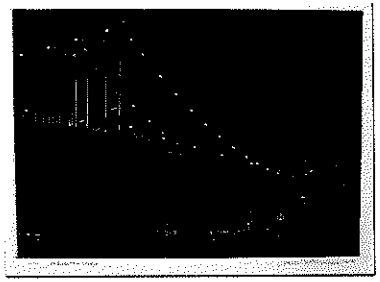
ID	1746
Artist	Cezanne, Paul
Title	Tete de jeune fille
media details	etching and aquatint on sepia on wove paper
Size	12-3/4" x 9-1/2"
Value	$1,000
Signature Pos.	
Dated	circa 1873
Acq. History	Provenance: Hubert Gallery, New York City

ID	1747
Artist	Roualt, Georges
Title	Femme Hideuse
media details	etching with aquatint on paper
Size	22-1/8" x 14-7/8"
Value	$450
Signature Pos.	
Dated	circa 1916-19
Acq. History	Provenance: Hubert Gallery, New York City

ID 1748
Artist Lucioni, Luigi
Title Birch Grays
media details etching
Size 9" x 14" **Value** $450
Signature Pos. **Dated**
Acq. History Provenance: Hubert Gallery, New York City

ID 1749
Artist Lucioni, Luigi
Title White Shadows
media details etching
Size **Value** $450
Signature Pos. **Dated** 1949
Acq. History Provenance: Hubert Gallery, New York City

ID 1750
Artist Merritt, Henry Samuel
Title Untitled
media details oil on panel
Size 11-1/4" x 15-1/4" **Value** $1,500
Signature Pos. **Dated**
Acq. History Provenance: Hubert Gallery, New York City



ID	1751
Artist	Mershimer, Frederick
Title	Manhattan Bridge
media details	Mezzotint
Size	9-3/4" x 13-3/4"
Value	$1,800
Signature Pos.	
Dated	1988
Acq. History	Provenance: Hubert Gallery, New York City

ID	1752
Artist	Muller, Alfredo
Title	Place Blanche
media details	color etching, aquatint and hand coloring
Size	
Value	$5,500
Signature Pos.	
Dated	1904
Acq. History	Provenance: Hubert Gallery, New York City

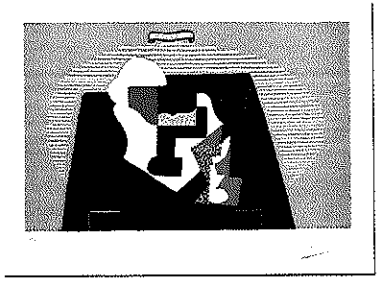
ID	1753
Artist	Severini, Gino
Title	Nature Morte au Compas
media details	pochoir in colors on Lafuma paper
Size	18" x 12-3/4"
Value	$4,400
Signature Pos.	Signed 'G. Severini' in t
Dated	1930
Acq. History	Provenance: Hubert Gallery, New York City

ID	1754
Artist	Severini, Gino
Title	Serenade a la Lune
media details	pochoir in colors on Lafuma paper
Size	17-3/4" x 12-1/2" **Value** $4,400
Signature Pos.	Signed 'G. Severini' in t **Dated** 1930
Acq. History	Provenance: Hubert Gallery, New York City

ID	1755
Artist	Severini, Gino
Title	Epilogue
media details	Pochoir in colors with gold leaf on Lafuma paper
Size	18" x 12-3/4" **Value** $4,400
Signature Pos.	Signed 'G. Severini' in t **Dated** 1930
Acq. History	Provenance: Hubert Gallery, New York City

ID	1756
Artist	Severini, Gino
Title	Die Familie des Harlekin
media details	lithograph on wove paper
Size	**Value** $4,800
Signature Pos.	Signed in black ink lowe **Dated** 1922-23
Acq. History	Provenance: Hubert Gallery, New York City

ID 1757
Artist Severini, Gino
Title Natura Morta con Fruttiera e Bicchiere
media details color lithograph on wove paper
Size 14-1/2" x 19-1/2" **Value** $7,000
Signature Pos. Hand signed by the artist **Dated** 1964 - 1965
Acq. History Provenance: Hubert Gallery, New York City



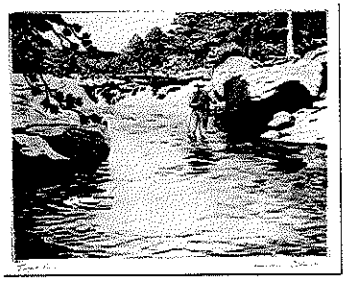
ID 1758
Artist Severini, Gino
Title Paysage et Nature More sur un Table
media details pochoir in colors on Lafuma paper
Size 18" x 12-3/4" **Value** $4,600
Signature Pos. Signed 'G. Severini' in t **Dated** 1930
Acq. History Provenance: Hubert Gallery, New York City

ID 1759
Artist Ettinger, Churchill
Title Tragedy!
media details etching
Size **Value** $500
Signature Pos. signed and titled in pe **Dated**
Acq. History Provenance: Hubert Gallery, New York City

ID 1760
Artist Ettinger, Churchill
Title Planning the Campaign
media details etching
Size **Value** $250
Signature Pos. signed and titled in pe **Dated** 1936
Acq. History Provenance: Hubert Gallery, New York City

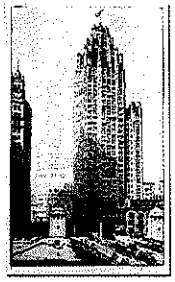
ID 1762
Artist Ettinger, Churchill
Title Skiers
media details etching
Size **Value** $350
Signature Pos. lower right, signed and **Dated** 1949
Acq. History Provenance: Hubert Gallery, New York City

ID 1763
Artist Ettinger, Churchill
Title Tight Line
media details etching
Size **Value** $250
Signature Pos. lower right, signed and **Dated**
Acq. History Provenance: Hubert Gallery, New York City



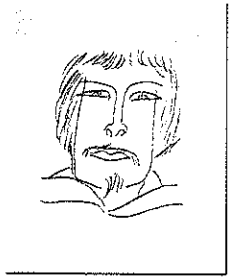
ID	1764
Artist	Ettinger, Chuchill
Title	Untitled
media details	etching
Size	**Value** $250
Signature Pos.	lower right, in pencil **Dated**
Acq. History	Provenance: Hubert Gallery, New York City

ID	1765
Artist	Unknown
Title	Poster for a performance of The Barber of Seville b
media details	poster
Size	**Value** $250
Signature Pos.	**Dated** circa 1924
Acq. History	Provenance: Hubert Gallery, New York City

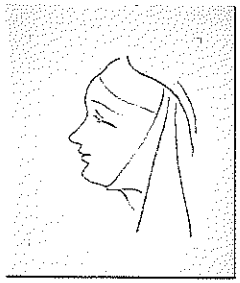


ID	1766
Artist	Dahlgren, Charles W.
Title	The Tower
media details	etching
Size	16" x 10" **Value** $500
Signature Pos.	lower right **Dated**
Acq. History	Provenance: Hubert Gallery, New York City

ID	1767
Artist	Wilkinson, Norman
Title	Trout fishing in Maine
media details	etching on paper
Size	**Value** $800
Signature Pos.	**Dated**
Acq. History	Provenance: Hubert Gallery, New York City

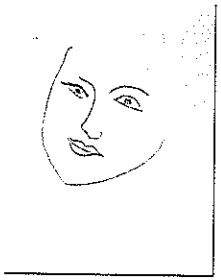


ID	1768
Artist	Matisse, Henri
Title	*Georges Duthuit, Une fete en Cimmerie*
media details	
Size	**Value** $4,500
Signature Pos.	**Dated** 1946
Acq. History	Provenance: Hubert Gallery, New York City



ID	1769
Artist	Matisse, Henri
Title	*Marianna Alcaforadeo, Lettres*,
media details	lithograph on velin d'Arches
Size	13" x 10" **Value** $4,500
Signature Pos.	**Dated** 1946
Acq. History	Provenance: Hubert Gallery, New York City

ID	1770
Artist	Matisse, Henri
Title	*Tristan Tzara, Le signe de vie*
media details	lithograph in sanguine on Arches
Size	13" x 10"
Value	$8,500
Signature Pos.	
Dated	1946
Acq. History	Provenance: Hubert Gallery, New York City



WESTPORT PUBLIC SCHOOLS, WESTPORT CT

REQUEST FOR BID

INSTALLATION OF FIRE ALARM EQUIPMENT, PAGING EQUIPMENT AND MASS NOTIFICATION EQUIPMENT

TABLE OF CONTENTS

Westport Public Schools Westport, CT

I. Fire Alarm System / Paging System / Mass Notification System General Requirements

The contractor shall provide a complete integrated mass notification system, including all devices, equipment, wiring and conduit. Applicable codes for this project include NFPA, Connecticut Fire Safety Code, International Building code and the National Electrical Code. The system shall also comply with requirements of the National Board of Fire Underwriters', the Americans with Disabilities Act Accessibility Guidelines and all applicable state, local and federal codes. Where conflicts exist between code requirements, the more stringent requirement acceptable to the authority having jurisdiction shall be provided.

Scope of work includes upgrades and modifications to the existing Notifier Fire Alarm Voice Evacuation Systems and Public Address Systems for eight Westport Public Schools. Modifications will include additional fire alarm speakers or paging speakers for both the interior and exterior of all schools, amplifiers, speaker control cards, and power supplies. Additional mass notifications system messages will be provided for emergency lockdown system messages which will be in addition to the existing fire alarm emergency messages. New emergency lockdown buttons will be provided and installed within the administrative areas of all schools.

Mass notification system messages shall be activated by emergency lockdown buttons located in administrative areas which shall annunciate voice messages throughout all fire alarm speakers within a school in all areas simultaneously. In addition to activating messages throughout the fire alarm system lockdown, emergency messages shall also be distributed throughout all public address speakers, close all fire doors and activate emergency lockdown message at the Westport Police Department.

II. Materials & Methods

The following information summarizes the desired materials and methods for the fire alarm and system. Refer to specifications for additional information.

Wiring method throughout the facility will be Fire Alarm MC Cable. In certain areas subject to physical damage, conduit and wire shall be used as specified. Where wiring must be exposed in finished spaces, surface non-metallic raceway (Wiremold or approved equal) shall be utilized, and shall be colored to match the surface it is mounted on. Raceways should be concealed where possible. Existing conduits routed underground to outbuildings or equipment on site for fire alarm may be re-used if they are of adequate size, in good condition and contain only fire alarm wiring. Any new conduits required to be run to outbuildings or site equipment shall be routed

underground in rigid galvanized steel conduit at the code required burial depth.

All devices and equipment shall be listed UL for fire alarm and listed for the environment it is installed in. Devices located outdoors or in wet/damp environments shall be weatherproof type. All devices shall be located such that adequate serviceability is possible.

Where existing devices are removed and an empty box or hole remains, provide patching and a cover plate painted to match adjacent surfaces. All painting and patching due to demolition or physical damage caused during installation of new work shall be the responsibility of the electrical alarm contractor.

All fire stopping and sealing shall be the responsibility of the installation contractor.

III. Supplemental Installation Guidelines and Requirements

Contractors shall allow preliminary post contract award time for walk troughs at all schools to field determined location of all interior and exterior speakers, emergency lockdown buttons and ancillary equipment as required.

High School - 6 hours
Middle Schools - 4 hours
Elementary Schools - 2 hours

All exterior speakers will be an average of 80 foot spacing with a maximum of 100 foot spacing allowed.

All interior speakers will be an average of 40 foot spacing with a maximum of 60 foot spacing allowed.

New speaker quantities are to be provided as shown on building overview drawings.

New lockdown button quantities are to be provided as shown on building overview drawings.

Equipment wiring to be provided as shown on system riser diagrams.

INTELLIGENT REPORTING FIRE DETECTION SYSTEM / PAGING SYSTEM / MASS NOTIFICATION SYSTEM

PART 1.0 - GENERAL

1.1 DESCRIPTION:

A. This section of the specification includes the furnishing, installation, connection, testing and modifications to the existing microprocessor control, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Remote Control Panels, auxiliary control devices, transponders, annunciators and specified herein.

B. The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.

C. The fire alarm manufacturer shall be of the highest caliber and insist on the highest quality. The system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994.

D. The FACP and peripheral devices shall be manufactured 100% by a single U.S. manufacturer (or division thereof).

E. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and shall be in compliance with the UL listing.

1.2 SCOPE:

A. The existing fire alarm voice evacuation system, fire alarm command centers and public address system shall be modified in accordance to the project specifications and site drawings.

B. Basic Performance:

1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 6 (Class A) Signaling Line Circuits (SLC).

2. Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style A) as part of an addressable device connected by the SLC Circuit.

3. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.

4. Digitized electronic signals shall employ check digits or multiple polling.

5. A single ground or open on the system signaling line circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

6. Alarm signals arriving at the main FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.

7. NAC speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone whichever is greater.

8. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.

9. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.

C. BASIC SYSTEM FUNCTIONAL OPERATION

When a fire alarm condition or lockdown condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

1. The system alarm LED on the FACP shall flash.

2. A local piezo electric signal in the control panel shall sound.

3. A backlit 640 character or 80 character LCD display on the FACP shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.

4. All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.

5. Fire alarm voice evacuation messages shall be distributed to all fire alarm speakers throughout the facility.

6. Emergency lockdown voice evacuation messages shall be distributed to all speakers throughout the facility to include both fire alarm and paging speakers.

7. All fire doors shall close.

8. Fire alarm activation shall annunciate at fire department via digital dialer.

9. Lockdown activation buttons shall annunciate at police department via digital dialer.

1.3 SUBMITTALS

A. General:

1. Four copies of all submittals shall be submitted to the Consultant for review.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.

2. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.

3. Show annunciator layout, configurations, and terminations.

C. Manuals:

1. Submit simultaneously with the shop drawings, complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets.

2. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment.

3. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system.

D. Software Modifications:

1. Provide the services of a Notifier factory trained NICET III authorized technician to perform all system software modifications, upgrades or changes.

2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

E. Certifications:

Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of the installation and the proposed performer of contract maintenance is a Connecticut authorized representative of the major equipment manufacturer. Include names and addresses in the certification. Provide certifications for NICET III Technicians.

1.4 GUARANTY:

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

1.5 APPLICABLE STANDARDS AND SPECIFICATIONS:

The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards.

A. National Fire Protection Association (NFPA) - USA:

No. 12	CO2 Extinguishing Systems
No. 12A & 12B	Halon Extinguishing Systems
No. 15	Water Spray Systems
No. 16	Foam/Water Deluge and Spray Systems
No. 72-1993	National Fire Alarm Code
No. 101	Life Safety Code

B. Underwriters Laboratories Inc. (UL) - USA:

No. 268 Smoke Detectors for Fire Protective Signaling Systems
No. 864 Control Units for Fire Protective Signaling Systems
No. 268A Smoke Detectors for Duct Applications
No. 521 Heat Detectors for Fire Protective
No. 464 Audible Signaling Appliances
No. 38 Manually Actuated Signaling Boxes
No. 346 Waterflow Indicators for Fire Protective Signaling Systems
No. 1076 Control Units for Burglar Alarm Proprietary Protective Signaling Systems
No. 1971 Visual Notification Appliances

C. Local and State Building Codes.

D. All requirements of the Authority Having Jurisdiction (AHJ).

E. Distributor of fire alarm to be an approved UUJS certified company.

1.6 APPROVALS:

A. The system shall have proper listing and/or approval from the following nationally recognized agencies:

UL Underwriters Laboratories Inc.
FM Factory Mutual

B. The fire alarm control panel shall meet UL Standard 864 (Control Units) and UL Standard 1076 (Proprietary Burglar Alarm Systems).

PART 2.0 PRODUCTS

2.1 EQUIPMENT AND MATERIAL, GENERAL:

A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protective signaling system, meeting the National Fire Alarm Code.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

D. All equipment proposed is based on Notifier. No other systems will be considered.

E. Integrated Technical Systems Wallingford, Connecticut shall provide the equipment and technical services to all bidding contractors.

2.2 CONDUIT/MC CABLE:

A. Conduit:

1. Conduit shall be in accordance with the National Electrical Code (NEC), local and state requirements.

2. All wiring in exposed areas which are not used for vertical risers shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.

3. MC Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-29.

4. Wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.

6. Conduit shall be 3/4 inch (19.1 mm) minimum.

B. MC Cable:

1. All wiring used for main riser cables shall be MC Cable as manufactured by AFC or equal.

2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for initiating device circuits and signaling line circuits, and 14 AWG (1.63 mm) for notification appliance circuits.

3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

4. Wire and cable not installed in conduit must be MC Cable and shall have a fire resistance rating suitable for the installation as indicated in NFPA 70.

5. All field wiring shall be completely supervised.

C. Terminal Boxes, Junction Boxes and Cabinets:

All boxes and cabinets shall be UL listed for their use and purpose.

D. Initiating circuits shall be arranged to serve like categories (manual, smoke, waterflow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to intelligent reporting devices.

E. The fire alarm control panel and remote transponders shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power

distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.

2.3 MAIN FIRE ALARM CONTROL PANEL:

A. The specification is based on modifying the existing Notifier Fire Alarm Voice Evacuation System Control Panels within eight separate schools. The system shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.

B. Operator Control:

1. Acknowledge Switch:

A. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the 640-character LCD display to the next alarm or trouble condition.

B. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

2. Alarm Silence Switch:

Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silence able by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

3. Alarm Activate (Drill) Switch:

The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

4. System Reset Switch:

Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.

5. Lamp Test:

The Lamp Test switch shall activate all system LEDs and light each segment of the liquid crystal display.

C. System Capacity and General Operation:

1. The control panels shall provide a minimum of 1 - 10 SLC circuits and be capable of expansion from 318 to 3180 intelligent/addressable devices.

2. The system shall include Form-C alarm, trouble, supervisory, and security relays rated at a minimum of 3.0 amps @ 30 VDC. It shall also include four Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable notification appliance circuits.

3. Output modules (signal, speaker, telephone, or relay), each with 6 circuits. These circuits shall be Class A (NFPA Style D) or Class A (NFPA Style Z) per the project drawings.

4. The fire alarm control panel shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.

5. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel. The system shall be fully programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes.

6. The system shall allow the programming of any input to activate any output or group of outputs. Systems which have limited programming (such as general alarm), have complicated programming (such as a diode matrix), or require a laptop personal computer are not considered suitable substitutes.

7. The FACP shall provide the following features:

A.) Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.

B.) Detector sensitivity test, meeting requirements of NFPA 72, Chapter 7.

C.) Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.

D.) Nine sensitivity levels for alarm, selected by detector. The system shall also include up to nine levels of pre-alarm, selected as a percentage of the alarm level, in steps from 90% down to 50%.

E.) System status reports to display or printer.

F.) Alarm verification, with verification counters.

G.) PAS pre-signal, meeting NFPA 72 3-8.3 requirements.

H.) Rapid manual station reporting (under 3 seconds).

I.) Non-alarm points for general (non-fire) control.

J.) Periodic detector test, conducted automatically by the software.

K.) Self optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its pre-alarm level to just above normal peaks.

L.) Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.

M.) Walk test, with a check for two detectors set to same address.

N.) Control-by-time for non-fire operations, with holiday schedules.

O.) Day/night automatic adjustment of detector sensitivity.

P.) Device blink control for sleeping areas.

Q.) UL-1076 security monitor points.

8. The FACP shall be capable of coding notification circuits in march time (120 PPM), temporal (NFPA 72 A-2-2.2.2), and California code.

D. Central Microprocessor

1. The microprocessor shall be a state-of-the-art, high speed, 16 bit RISC device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, non-volatile memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.

2. The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.

3. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.

4. A special program check function shall be provided to detect common operator errors.

5. An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.

6. For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download. This program shall also have a verification utility which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.

E. Display

1. The display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters.

2. The display shall include status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

3. The display shall include an 80-character back-lit alphanumeric Liquid Crystal Display (LCD). It shall also provide 8 Light-Emitting-Diodes (LEDs, that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SECURITY ALARM, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, and ALARM SILENCED.

4. The display keypad shall be an easy to use QWERTY type keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.

5. The display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.

F. Signaling Line Circuits (SLC)

1. The system shall include from one to ten SLC circuits. Each SLC interface shall provide power to and communicate with up to 159 intelligent detectors (ionization, photoelectric or thermal) and 159 intelligent modules (monitor or control) for a system capacity of 3180 devices. Each SLC loop shall be capable of NFPA 72 Style 6 (Class A) wiring.

2. The Loop Control Module (LCM) shall receive analog information from all intelligent detectors to be processed to determine whether normal, alarm, pre-alarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information shall also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.

3. The detector software shall meet NFPA 72, Chapter 7 requirements and be certified by UL as a calibrated sensitivity test instrument.

4. The detector software shall allow manual or automatic sensitivity adjustment.

G. Serial Interfaces

1. The system shall include two serial EIA-232 interfaces. Each interface shall be a means of connecting UL Listed Electronic Data Processing (EDP) peripherals.

2. One EIA-232 interface shall be used to connect an UL-Listed 40 or 80 column printer. Printers which are not UL-Listed are not considered acceptable substitutes.

4. The system shall include an EIA-485 port for the serial connection of optional annunciators and remote LCD displays.

5. The EIA-485 interface may be used for network connection to a proprietary receiving unit.

H. Notification Appliance Circuit (NAC) Module

1. The notification appliance circuit module shall provide six fully supervised Class A or B (NFPA Style Z or Y) notification circuits. An expansion circuit board shall allow expansion to eight circuits per module.

2. The notification circuit capacity shall be 3.0 amperes maximum per circuit and 6.0 amperes maximum per module.

3. The module shall not affect other module circuits in any way during a short circuit condition.

4. The notification circuit module shall be provided with removable wiring terminal blocks for ease of installation and service. The terminal strips shall be UL listed for use with up to 12 AWG wire.

5. Each circuit shall be capable of, through system programming, deactivating upon depression of the signal silence switch.

I. Control Relay Module

1. The control relay module shall provide six Form-C auxiliary relay circuits rated at 5 amperes, 28 VDC. An expansion circuit board shall allow expansion to eight Form-C relays per module.

2. Each relay circuit shall be capable of being activated (change in state) by any initiating device or from any combination of initiating devices.

3. The control relay module shall be provided with removable wiring terminal blocks for ease of installation and service. The terminal blocks shall be UL listed for use with up to 12 AWG wire.

J. Voice Control Module

1. The voice control (speaker circuit) module shall provide three fully supervised Class A (NFPA Style Z) speaker circuits.

2. Each speaker circuit shall be capable of switching up to 30 watts maximum per circuit or 60 watts per four circuit module.

3. If a short-circuit trouble occurs on one of the circuits, that circuit will not activate on either manual or automatic command.

4. The voice control module shall be provided with removable wiring terminal blocks for ease of installation and service. The terminal strips shall be UL Listed for use with up to 12 AWG wire.

5. Each speaker circuit module may be programmed to activate on activation of the All-Call switch and to deactivate upon pressing the signal silence switch.

K. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

2. The back box and door shall be constructed of .060 steel with provisions for electrical conduit connections into the sides and top.

3. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. For convenience, the door may be selected for either right or left hand hinging.

L. Digital Voice Command Center (DVCC)

The Digital Voice Command Center (DVCC) shall contain equipment required for all audio control, telephone system control, signaling and supervisory functions. This shall include

amplifiers, tone generators, digital voice units, a microphone and a main telephone handset. The voice command center shall be an integral part of the fire alarm system. Systems which require separate, non integrated voice systems are not considered suitable substitutes.

Function: The voice command center equipment shall perform the following functions:

1. Operate as a supervised single channel or dual channel emergency voice communication system.

2. Provide automatic custom digital recorded voice message and tone generation.

3. Provide a hand held microphone with priority push-to-talk switch.

4. Provide an all-call switch and indicator to quickly activate all speaker circuits.

M. Power Supply:

1. The main power supply for the fire alarm control panel shall provide 6.0 amps of available power for the control panel and peripheral devices.

2. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.

3. Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger for use with batteries up to 55 AH or may be used with an external battery and charger systems. Battery arrangement may be configured in the field.

4. The main power supply shall continuously monitor all field wires for earth ground conditions, and shall have the following LED indicators:

Ground Fault LED
Battery Fail LED
AC Power Fail LED

5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.

6. The main power supply shall provide a battery charger for 60 hours of standby using dual-rate charging techniques for fast battery recharge.

7. The main power supply shall provide a very low frequency sweep earth detect circuit, capable of detecting earth faults on sensitive addressable modules.

8. The main power supply shall provide meters to indicate battery voltage and charging current.

9. All circuits shall be power-limited, per 1995 UL864 requirements.

N. Audio Amplifiers (Size amplifiers with a minimum spare capacity of 20% and provide a minimum of one backup amplifier for each transponder shown.)

1. The audio amplifiers will provide audio power (@ 25 Volts RMS) for distribution to the speaker circuits.

2. Multiple audio amplifiers may be mounted in the fire alarm control panel using additional cabinets if necessary.

3. The audio amplifiers shall include an integral power supply, and shall provide the following controls and indicators:

Normal Audio Level LED
Incorrect Audio Level LED
Brownout LED
Battery Trouble LED
Amplifier Trouble LED
Audio Amplifier Gain Adjust

4. Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment.

5. All terminal blocks for the connection of field wiring shall have a removable plug-in and be hardwired to allow for ease of field wire installation in a cabinet or at a remote location.

6. The amplifier shall include audio input and amplified output supervision, back-up input, and automatic switch-over to back up (if primary amplifier should fail).

7. Amplifiers shall be backed up in groups (one amplifier backs up several).

O. Prerecorded Voice - Audio Message Generator

1. The voice communication system shall be capable of transmitting a prerecorded voice message to all speakers in the building, or to any programmed group of speakers.

2. Actuation of any alarm initiating device shall cause a pre-recorded message to sound over the speakers. The message shall be repeated four times.

3. A built-in microphone shall be provided to allow paging through speaker circuits and shall have priority over the alarm message.

4. The message generator shall provide an interface to allow paging through telephone circuits.

5. The audio message generator shall have the following controls and indicators to allow for proper operator understanding and control.

Audio Level Normal LED
All Call LED
On-Line LED
Amplifier Trouble LED
Speaker Trouble LED
All Call Switch
Local Speaker Volume Control

6. The prerecorded message shall be stored on a non-volatile read only memory chip. The message shall be up to 24 seconds in length. An optional random access chip shall be available for a field programmable message. This message shall be programmed through the system's microphone or downloaded via a cassette recorder. Systems which utilize prerecorded memory storage other than on ROM type memory chips are not suitable substitutes.

P. Specific System Operations

1. Smoke Detector Sensitivity Adjust: A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window and have a minimum of 9 levels.

2. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification delay shall be programmable from 5 to 30 seconds and each detector shall be able to be selected for verification. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.

3. Point Disable: Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.

4. Point Read: The system shall be able to display or print the following point status diagnostic functions:

a. Device status
b. Device type
c. Custom device label
d. View analog detector values
e. Device zone assignments
f. All program parameters

5. System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system status.

6. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 1000 events. 200 events shall be dedicated to alarm and the remaining events are general purpose. Each of these activations will be stored and time and date stamped with the actual time of the activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety.

The history buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable substitutes.

7. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display, and printed on the optional printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.

8. Pre-Alarm Function: The system shall provide two levels of pre-alarm warning to give advance notice of a possible fire situation. Both pre-alarm levels shall be fully field adjustable. The first level shall give an audible indication at the panel. The second level shall give an audible indication and may also activate control relays. The system shall also have the ability to activate local detector sounder bases at the pre-alarm level, to assist in avoiding nuisance alarms.

9. Software Zones: The FACP shall provide 99 software zones and 10 additional special function zones.

10. The fire alarm control panel shall include a walk test feature. It shall include the ability to test initiating device circuits and notification appliance circuits from the field without returning to the panel to reset the system. Operation shall be as follows:

A. Alarming an initiating device shall activate programmed outputs, which are selected to participate in walk test, for 3 seconds.

B. Introducing a trouble into the initiating device shall activate the programmed outputs for 8 seconds.

C. Walk test shall be selectable on a per device/circuit basis. All devices and circuits which are not selected for walk test shall continue to provide fire protection and if an alarm is detected, will exit walk test and activate all programmed alarm functions.

D. All devices tested in walk test shall be recorded in the history buffer.

11. Waterflow Operation (Provide one FMM-1 for Each)

An alarm from a waterflow detection device shall activate the appropriate alarm message on the 640 character display, turn on all programmed notification appliance circuits and shall not be affected by the signal silence switch.

12. Supervisory Operation (Provide one FMM-1 for Each)

An alarm from a supervisory device shall cause the appropriate indication on the 640 character display, light a common supervisory LED, but will not cause the system to enter the trouble mode.

13. Signal Silence Operation

The FACP shall have the ability to program each output circuit (notification, relay, speaker etc.) to deactivate upon depression of the signal silence switch.

14. Non-Alarm Input Operation

Any addressable initiating device in the system may be used as a non-alarm input to monitor normally-open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.

2.4 SYSTEM COMPONENTS:

A. Speakers (Speaker/Strobes are to meet requirements of both paragraphs A and B)

1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.

2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).

3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.

4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

B. Strobe lights shall meet the requirements of the ADA, UL Standard 1971, NFPA 2002 and shall meet the following criteria:

1. The pulse duration shall be between minimum of one second and maximum of two seconds.

2. Strobe intensity shall meet the requirements of UL 1971, NFPA 2002 and ADA.

3. All visual units shall be synchronized to meet ADA requirements using sync modules.

C. Alphanumeric LCD Type Annunciator

1. The alphanumeric display annunciator shall be a supervised, remotely located back-lit LCD display containing a minimum of eighty (640) characters for alarm annunciation in clear English text.

2. The LCD annunciator shall display all alarm and trouble conditions in the system.

3. An audible indication of alarm shall be integral to the alphanumeric display.

4. The display shall be UL listed for fire alarm application.

5. It shall be possible to connect up to 32 LCD displays and be capable of wiring distances up to 6000 feet from the control panel.

6. The annunciator shall connect to a separate, dedicated "terminal mode" EIA-485 interface. This is a two-wire connection and shall be capable of distances to 6,000 feet. Each terminal mode LCD display shall mimic the main control panel.

7. The system shall allow a minimum of 32 terminal mode LCD annunciators. Up to 10 LCD annunciators shall be capable of the following system functions: Acknowledge, Signal Silence and Reset which shall be protected from unauthorized use by a key switch or password.

8. Provide annunciator key switch to enable or disable operation of annunciator membrane control switches.

D. All interfaces and associated equipment are to be protected so that they will not be affected by voltage surges or line transients consistent with UL standard 864.

E. Field Wiring Terminal Blocks

For ease of service all panel I/O wiring terminal blocks shall be removable, plug-in types and have sufficient capacity for 18 to 12 AWG wire. Terminal blocks which are permanently fixed are not acceptable.

F. Annunciator Control Module

G. Transponders

1. Transponders shall be listed under UL category UOJZ as an independent, local fire alarm control unit as well as being listed as a critical component in a multiplex fire alarm system. Transponders shall be located where shown on the plans.

The transponder shall serve as the interface between initiating fire devices, controlled signaling devices, and each FACP node. The supervised multiplex communication port shall be an integral part of the transponder.

2. Each transponder shall be powered from a local power supply, and shall provide all power necessary for its own operation, including standby power.

3. Transponders shall communicate with, and be controlled by, the host FACP via a 2-wire communications loop. The communications loop shall operate as an NFPA Style 6.

4. Transponders shall be used to house amplifiers, batteries and power supplies to allow true distributed processing and amplification.

5. Each transponder shall have the following indicators and operator controls:

a. Alarm Acknowledge/Reset Switch
b. Power LED
c. System Alarm LED
d. System Trouble LED
e. Local Piezoelectric Signal
f. Red Alarm Per Initiating Device Circuit
g. Green On/Off LED Per Notification Appliance Circuit or Relay

6. Each transponder shall be capable of expansion of up to 36 field circuits per row of the following types in any mix:

A. Initiating Device Circuits (IDC): IDCs may be added to the transponder in groups of 6 Style D (Class A) circuits. Each circuit shall be capable of monitoring up to 30 compatible 2-wire smoke detectors, and/or any number of contact type initiating devices.

B. Fire Fighter's Telephone Circuits: Firefighter's telephone circuits may be added to the transponder in groups of up to 6 circuits.

C. Fire alarm speaker circuits: Fire alarm speaker circuits may be added to the transponder in groups of up to 8 circuits. Each circuit shall be cable of supervising the field circuit, and of transmitting up to 30 watts of audio power.

D. Auxiliary Control Relay Outputs: Auxiliary relay outputs may be added to the transponder in groups of eight individually controlled single Form-C circuits, or four dual Form-C circuits. All Auxiliary circuits shall be rated 2 A. @ 30 VDC.

2.5 SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall use simple to install and maintain decade (numbered 1 to 16) type address switches.

2. Addressable devices which use a binary address setting method, such as a Dip switch, are difficult to install and subject to installation error. This type of device is not an allowable substitute.

3. Detectors shall be intelligent (analog) and addressable, and shall connect with two wires to the fire alarm control panel signaling line circuits.

4. Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. If required, the LED flash shall have the ability to be removed from the system program. An output connection shall also be provided in the base to connect an external remote alarm LED.

5. Smoke detector sensitivity shall be set in the fire alarm control panel and shall be adjustable in the field through the field programming of the system. Sensitivity may be automatically adjusted by the panel on a time-of-day basis.

6. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.

7. The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base shall include a sounder base with a built-in (local) sounder rated at 85 DBA minimum, a relay base and an isolator base designed for Style 7 applications.

8. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel.

9. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).

10. Detectors will operate in an analog fashion, where the detector simply measures its designed environment variable and transmits an analog value to the FACP based on real-time measured values. The FACP software, not the detector, shall make the alarm/normal decision, thereby allowing the sensitivity of each detector to be set in the FACP program and allowing the system operator to view the current analog value of each detector.

11. Detectors shall provide address-setting means using decimal switches and shall also store an internal identifying code that the control panel shall use to identify the type of device. LEDs shall be provided that shall flash under normal conditions, indicating that the device is operational and is in regular communication with the control panel.

12. A magnetic test switch shall be provided to test each detector for 100% obscuration, reported to the FACP.

13. Addressable devices shall provide address-setting means using decimal switches and shall also store an internal identifying code that the control panel shall use to identify the type of device. LED(s) shall be provided that shall flash under normal conditions, indicating that the device is operational and is in regular communication with the control panel.

14. A magnetic test switch shall be provided to test detectors and modules. Detectors shall report an indication of an analog value reaching 100% of the alarm threshold.

B. Addressable Manual Pull Box

1. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.

2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.

3. Manual stations shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches or larger.

4. Stations shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches, nor more than 48 inches above the finished floor.

C. Intelligent Photoelectric Smoke Detector

1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

D. Intelligent Thermal Detectors

1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit. Up to 159 intelligent heat detectors may connect to one SLC loop.

E. Intelligent Duct Smoke Detector

1. The in-duct smoke detector housing shall accommodate either an intelligent ionization detector or an intelligent photoelectric detector, of that provides continuous analog monitoring and alarm verification from the panel.

2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system.

F. Addressable Dry Contact Monitor Module

1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLC loops.

2. The monitor module shall mount in a 4-inch square, 2-1/8 inch deep electrical box.

3. The IDC zone may be wired for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

4. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch x 1-1/4 inch x 1/2 inch. This version need not include Style D or an LED.

G. Addressable Control Module

1. Addressable control modules shall be provided to supervise and control the operation of one conventional NACs of compatible, 24 VDC powered, polarized audio/visual

notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay.

2. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.

3. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

4. Audio/visual power shall be provided by a separate supervised power loop from the main fire alarm control panel or from a supervised, UL listed remote power supply.

5. The control module shall be suitable for pilot duty applications and rated for a minimum of .6 amps at 30 VDC.

PART 3.0 - EXECUTION

3.1 INSTALLATION:

A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.

B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas.

C. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.

3.2 TEST:

The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72, Chapter 7.

1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

2. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.

3. Verify activation of all waterflow switches.

4. Open initiating device circuits and verify that the trouble signal actuates.

5. Open and short signaling line circuits and verify that the trouble signal actuates.

6. Open and short notification appliance circuits and verify that trouble signal actuates.

7. Ground all circuits and verify response of trouble signals.

8. Check presence and audibility of tone at all alarm notification devices.

9. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.

10. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.

11. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.3 FINAL INSPECTION:

A. At the final inspection, a factory trained representative of the manufacturer of the major equipment shall demonstrate that the system functions properly in every respect.

B. Upon final inspection and testing of the system an NFPA Final Completion Certificate shall be provided.

3.4 INSTRUCTION:

A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.

B. The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation" to the owner.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary.

1.2 SUMMARY

A. Section Includes:

1. Identification of power and control cables.
2. Identification for conductors.
3. Equipment identification labels.
4. Miscellaneous identification products.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 FIRE ALARM MC CABLE AND CONDUIT IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.2 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm). Overlay shall provide a weatherproof and UV-resistant seal for label.

B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

C. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

2.3 CABLE TIES

A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black.

B. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi (48.2 MPa).
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
5. Color: Black.

2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

G. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend.

B. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

C. Locations of Underground Lines: Identify with underground-line warning tape for underground fire alarm system where applicable.

D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to control panels, control stations, terminal cabinets, and racks of each system. Systems include signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

   a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
   b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:
   a. Enclosures and electrical cabinets.
   b. Access doors and panels for concealed electrical items.
   c. Fire alarm initiation device (address #).

END OF SECTION 260553

SECTION 280513 - CONDUCTORS AND CABLES FOR FIRE ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

1.2 SUMMARY

A. Section Includes:

1. Fire alarm wire and cable.
2. Identification products.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 FIELD CONDITIONS

A. Do not install conductors and cables that are wet, moisture damaged, or mold damaged.

1. Indications that wire and cables are wet or moisture damaged include, but are not limited to, discoloration and sagging of factory packing materials.

PART 2 - CPRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 FIRE ALARM WIRE AND CABLE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC MC Cable

B. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.

C. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer.

2.3 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Brady Worldwide, Inc.
2. HellermannTyton North America.
3. Kroy LLC.
4. Panduit Corp.

B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 INSTALLATION OF HANGERS AND SUPPORTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for installation of supports for cables.

3.2 WIRING METHOD

A. Install wiring in metal pathways and wireways.

1. Comply with requirements in Section 280528 "Pathways for Fire Alarm Sytems."

B. Install cable, concealed in accessible ceilings, walls, and floors when possible.

3.3 CONNECTIONS

A. Comply with requirements in Specifications: "Intelligent Reporting Fire Detection System" for connecting, terminating, and identifying wires and cables.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Prepare test and inspection reports.

END OF SECTION 280513

SECTION 280528 - PATHWAYS FOR FIRE ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Surface pathways.
3. Boxes.

1.3 ACTION SUBMITTALS

A. Product Data: For surface pathways, wireways and fittings.

PART 2 - PRODUCTS

2.1 SURFACE PATHWAYS

A. General Requirements for Surface Pathways:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Surface Nonmetallic Pathways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color to match adjacent surface from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Hubbell Incorporated; Wiring Device-Kellems Division.
b. Lamson & Sessions; Carlon Electrical Products.
c. Mono-Systems, Inc.
d. Panduit Corp.
e. Wiremold / Legrand.

2.2 BOXES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Adalet.
2. Cooper Technologies Company; Cooper Crouse-Hinds.
3. EGS/Appleton Electric.
4. Erickson Electrical Equipment Company.
5. Hoffman; a Pentair company.
6. Hubbell Incorporated; Killark Division.
7. Lamson & Sessions; Carlon Electrical Products.
8. Milbank Manufacturing Co.
9. Molex, Woodhead Brand
10. Mono-Systems, Inc.
11. O-Z/Gedney; a brand of EGS Electrical Group.
12. RACO; a Hubbell Company.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Stahlin Non-Metallic Enclosures; a division of Robroy Industries.
16. Thomas & Betts Corporation.
17. Wiremold / Legrand.

B. General Requirements for Boxes:

1. Boxes installed in wet locations shall be listed for use in wet locations.

C. Sheet-Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

H. Device Box Dimensions: As required.

I. Gangable boxes are allowed.

PART 3 - EXECUTION

3.1 PATHWAY APPLICATION

A. Outdoors: Apply pathway products as specified below unless otherwise indicated:

1. Exposed Conduit: Galvanized Rigid Conduit (GRC)
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: GRC.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply pathway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: Surface non-metallic pathway in finished spaces, MC cable in unfinished spaces.
2. Exposed, Not Subject to Severe Physical Damage: surface non-metallic pathway in finished spaces; EMT in unfinished spaces.
3. Exposed and Subject to Severe Physical Damage: surface non-metallic pathway in finished spaces, EMT in unfinished spaces. Pathway locations include the following:

    a. Loading docks.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
    d. Gymnasiums

4. Concealed in Ceilings and Interior Walls and Partitions: MC cable or EMT.
5. Damp or Wet Locations: GRC.
6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Pathway Size: 3/4-inch trade size.

D. Pathway Fittings: Compatible with pathways and suitable for use and location.

1. Rigid Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum pathways. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

B. Keep pathways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

C. Complete pathway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run. Support within 12 inches (300 mm) of changes in direction.

G. Conceal MC cable and conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches (300 mm) of enclosures to which attached.

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT or RMC for pathways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

L. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

M. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to conduit assembly to assure a continuous ground path.

N. Cut conduit perpendicular to the length. For conduits of 2-inch (53-mm) trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.

O. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground pathways designated as spare above grade alongside pathways in use.

P. Surface Pathways:

1. Install surface pathway for surface electrical outlet boxes only where indicated on Drawings.
2. Install surface pathway with a minimum 2-inch (50-mm) radius control at bend points.
3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

Q. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.

R. Install devices to seal pathway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service pathway enters a building or structure.
3. Where otherwise required by NFPA 70.

S. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

T. Expansion-Joint Fittings:

1. Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
    d. Attics: 135 deg F (75 deg C) temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

U. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

V. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surface to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

W. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

X. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR FIRE ALARM SYSTEMS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Fire Alarm Systems."

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 280528

SECTION 280544 - SLEEVES AND SLEEVE SEALS FOR FIRE ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

1.2 SUMMARY

A. Section Includes:

1. Sleeves for pathway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized-steel sheet.
2. Minimum Metal Thickness:

   a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
   b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Advance Products & Systems, Inc.
   b. CALPICO, Inc.
   c. Metraflex Company (The).
   d. Pipeline Seal and Insulator, Inc.
   e. Proco Products, Inc.

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Presealed Systems.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Silicone Foams: Multicomponent, silicone-based, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pathway or cable unless sleeve seal is to be installed..
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.

5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at pathway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

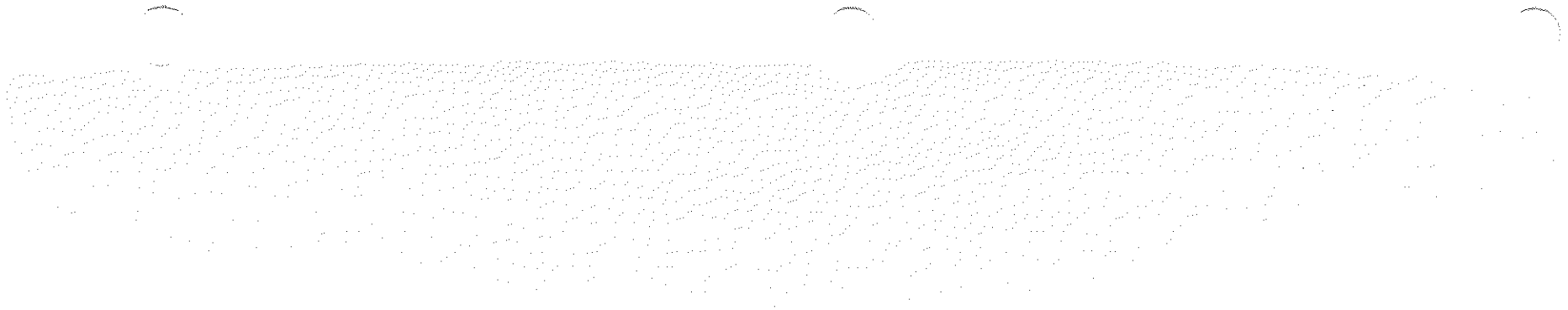
A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 280544



SPECIFICATIONS: RADIO SYSTEM DESCRIPTION

System Features **DRAFT**

General

The system shall provide reliable, efficient, radio functionality for Westport Board of Education's operational groups and shall accommodate Westport Board of Education's communications requirements between these operational groups. The Radio System shall be provided with the features, functions, and capabilities as described herein.

Required Features and Functions

The proposed Radio System and protocol shall support the following features and functions:

1. The system and/or user equipment must support digital transmissions on a 6.25 equivalent, 12.5 kHz TDMA channel. The system and/or user equipment must also support analog transmissions on 12.5 kHz channels.
2. The system and/or user equipment must follow ETSI DMR Tier 2 standards based operation.
3. The repeater/base station equipment must be able to manage two independent time slots on a single 12.5 kHz frequency using TDMA (Time Division Multiple Access) technology transmissions.
4. The system shall use a non-proprietary over the air signaling protocol for communications between the infrastructure and the subscriber radios.
5. All user portable radios must incorporate increased digital battery life over analog by operating in a TDMA digital mode.
6. All user portable radios must include battery technology for automatic maintenance and reconditioning.
7. All radio equipment must support the use of radio subscriber accessories for automatic gain control and noise suppression.

8. The system and/or user equipment must include imbedded digital forward error correction technology to increase clarity throughout range.

9. The system and/or user equipment must include imbedded software based privacy or scrambling to protect user privacy during communications. This imbedded scrambling must support at least 40-bit protection with multiple keys.

10. All user radios must include Emergency Declaration capability with single button activation. The Emergency Declaration shall provide visual and audible status notification to specified radios. The Vendor's Proposal shall include a detailed description of the Emergency Declaration features and programming options.

11. The system and/or user equipment must include imbedded GPS receivers in both the portable and mobile radios. Any additional external receivers or accessories shall not be required to receive or send GPS information. GPS shall be supported in a repeater and/or talk around mode.

12. The system and/or user equipment must include imbedded text messaging capabilities. Any additional external receivers or accessories shall not be required to receive or send text message information. The user equipment must support unit-to-unit canned and user creatable text messaging capability. The user equipment must support at least 140 scrolling characters. Text messaging shall be supported in a repeater and/or talk around mode.

13. The system and/or user equipment must include imbedded telemetry capabilities. Any additional external receivers or accessories shall not be required to receive or send telemetry information. Telemetry shall be supported in a repeater and/or talk around mode.

14. The system and/or user equipment must include intelligent channel steering capabilities to revert GPS traffic to alternate channels to control and manage data traffic more efficiently on the system.

15. Automatic Vehicle Location (AVL) information shall include vehicle identification, location, speed and time of transmission.

16. Voice shall take priority over data transmissions on radios transmitting both voice and data information.

17. The system user shall have the option of applying for licensure to detailed radio interface information. This information shall allow the radio user, if capable, to develop custom applications.

Multi-Site Capabilities:

1. The system shall be a multi-site, multi-channel radio network capable of supporting multiple interconnected user groups/fleets. Various entities and work groups must be able to communicate without regard to geographic location.

2. The system design should allow connection of any site in the network to any site in the network over IP (Internet Protocol) to achieve the required network connectivity between sites. The network infrastructure should allow the system operator the flexibility of being able to configure the network in a linear, star or mesh type of network configuration. Third party equipment shall not be required for this connection.

3. System capability should allow expandability to support additional and/or future sites, radio channels, and users. The network should have the capability of being expanded to at least 15 sites.

4. The system design should allow seamless roaming between sites. The system shall provide for automatic radio switching between network sites without any action by the user to provide communications without any message interruption throughout the designated coverage area.

Trunking Capabilities:

1. The system shall support the ability to trunk voice or data traffic to available system channels to maximize efficiency. The Trunking system shall automatically detect a P-T-T as a request to talk, and automatically select and assign a voice path for the communications of the selected talk group. Various entities and work groups must be able to communicate without regard to channel selection, radio site selection or geographic location.

2. The system Trunking protocol shall not require the use of a dedicated control channel, allowing voice/data to simultaneously trunk on all system channels.

3. While in trunked mode, the subscriber access time, defined as PTT to system access, shall not exceed 900 milliseconds when a trunked voice path is available.

4. The system must support the ability to simultaneously trunk twelve (12) voice paths.

5. The system must support twenty-four (24) additional data revert paths for additional data traffic needs.

6. The system shall be capable of supporting data communications that include GPS location services, text messaging, and a data interface for other customer specific and supplied applications including telemetry, system performance management, VoIP dispatch, AVL, work-order management, and email connectivity.

7. In the event of a repeater failure, the system shall continue to maintain its trunked operation, regardless of which repeater fails.

8. In the event of frequency interference, the system shall continue to maintain its trunked operation, regardless of the channel being interfered with.

9. The system shall provide a software application that allows the system administrator the ability to monitor and control the radio repeaters within the system. The Repeater Diagnostics and Reporting system shall provide the following capabilities:

    a. Repeater Diagnostics that include enabled-disabled station status, Transmitter power status, available channels and RSSI levels.

    b. Repeater Controls that include changing channels, transmitter power, station reset and repeater knockdown.

    c. Repeater Alarm Reporting including Receiver lock failure, transmit lock detect, station overheating, AC Power supply failure and detect and report of failure.

    d. The application shall operate over the IP network or locally via USB or GPIO connection.

User Equipment

General

All user radios proposed (portables, mobiles, and control stations) shall fully support all features and functions available for user radios in the proposed system. The pricing for user radios shall include all programming and installation services required for operation. At the appropriate time during the implementation process the Vendor will be expected to develop detailed programming personalities and talkgroup configurations with input and assistance from [CUSTOMER NAME]. User radio programming shall not be performed until [CUSTOMER NAME]'s Project Manger has approved the programming personalities and issued a written notice to proceed with radio programming.

All proposed portable, mobile, and control station radios shall conform to the minimum standards specified by TIA/EIA-603, Section 5 "Standards for Portables".

Portable Radios

The proposed portable radio should be rugged, reliable, and provide the following minimum features:

- Emergency button.
- 12.5 kHz analog channel bandwidth.
- 12.5 kHz TDMA (6.25e) digital channel bandwidth.
- Alphanumeric display.
- 32 Channels.
- Digital Signaling - PTT ID, Private Call, All Call, Call Alert, Escalating Alerts, Emergency, Radio Check, Radio Disable/Enable and Remote Monitor
- Analog Signaling - MDC1200: PTT ID, Emergency and Call Alert

- 16-position channel selector.
- Group scan.
- External microphone and speaker connections.
- Li-ion battery.
- Full line of optional accessories.
- Optional intrinsically safe model.
- 6 Programmable buttons (supporting both long and short press)
- Meets IP57 submersibility with or w/o accessory cover attached

Proposed portable radio units shall conform to applicable Portable Military Standards 810C, 810D, and 810E. The portable transmitters and receivers must further meet or exceed the following specifications.

Portable Transmitter

Frequency Range	403-512 MHz
Frequency Stability	+/- 1.5ppm (Non-GPS)
	+/- 0.5ppm (GPS)
RF Power Output	1 – 4 or 5 watts
Channel Spacing	12.5 kHz Analog / TDMA
Adjacent Channel Power	60 dB @ 12.5 kHz

Portable Receiver

Frequency Range	403-512 MHz
Channel Spacing	12.5 kHz Analog / TDMA
Analog Sensitivity (12 dB SINAD)	0.35 uV / .22uV (typical]
Digital Sensitivity	5% BER: 0.3 uV
Adjacent Channel Selectivity	60dB at 12.5 kHz
	@ (TIA603)
	45dB at 12.5 kHz
	@ (TIA603C)
Spurious Rejection	70 dB
Audio Distortion	3%

Mobile Radios

The proposed mobile radio should be rugged, reliable, and provide the following minimum features:

- Emergency button.
- 12.5 kHz analog channel bandwidth.
- 12.5 kHz TDMA (6.25e) digital channel bandwidth.
- Alphanumeric display.
- 32 Channels.
- Digital Signaling - PTT ID, Private Call, All Call, Call Alert, Escalating Alerts, Emergency, Radio Check, Radio Disable/Enable and Remote Monitor
- Analog Signaling - MDC1200: PTT ID, Emergency and Call Alert
- Group scan.
- Full line of optional accessories.
- Optional high power unit (at least 40 watts).
- 4 Programmable buttons (supporting both long and short press)

Mobile and control station transmitters and receivers must further meet or exceed the following specifications.

Mobile/Control Station Transmitter

Frequency Range	403 - 470 MHz
Frequency Stability	+/- 1.5ppm (Non-GPS)
	+/- 0.5ppm (GPS)
RF Power Output	40 or 45 watts
	(high power model)
Channel Spacing	12.5 kHz Analog / TDMA
Adjacent Channel Power	60 dB @ 12.5 kHz

Mobile/Control Station Receiver

Frequency Range	403 - 470 MHz
Channel Spacing	12.5 kHz Analog / TDMA
Analog Sensitivity (12 dB SINAD)	0.30 uV / .22uV (typical]
Digital Sensitivity	5% BER: 0.3 uV
Adjacent Channel Selectivity	65dB at 12.5 kHz (w / TIA603) 50dB at 12.5 kHz (w / TIA603C)
Spurious Rejection	75 dB
Audio Distortion	3%

Desktop Control Station Radios

Desktop control station radios will be installed at locations to be determined at a later date. The Proposal should include per unit pricing including standard installation for a recommended control station including the radio, power supply, external speaker, desktop microphone, and antenna. The following minimum features should be supported by the proposed control station radio:

- Emergency button.
- 12.5 kHz analog channel bandwidth.
- 12.5 kHz TDMA (6.25e) digital channel bandwidth.
- Alphanumeric display.
- 1000 Channels.
- Digital Signaling - PTT ID, Private Call, All Call, Call Alert, Escalating Alerts, Emergency, Radio Check, Radio Disable/Enable and Remote Monitor
- Analog Signaling - MDC1200: PTT ID, Emergency, and Call Alert
- Group scan.
- Full line of optional accessories.

- Optional high power unit (at least 40 watts).
- 4 Programmable buttons (supporting both long and short press

XPR8400 Repeaters

Base Station Transmitter

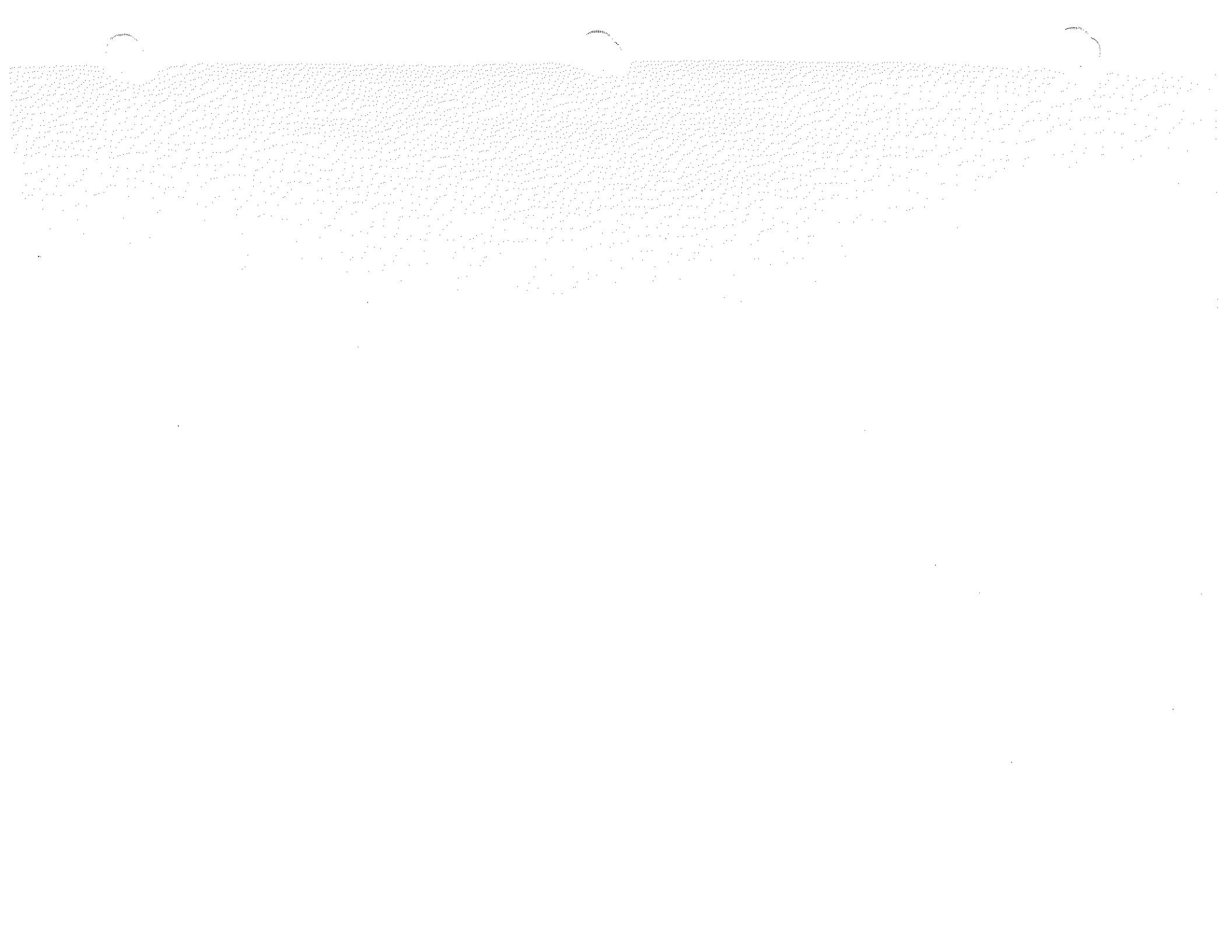
The base station transmitters shall conform to the minimum standards specified by TIA/EIA-603, Section 4.2, and the Code of Federal Regulations 47, Part 90, Subpart I. The transmitters shall further meet or exceed the following specifications.

Frequency Range	403-470 MHz
Frequency Stability	+ / - 0.5 ppm
RF Power Output	25-40 watts (continuous)
Channel Spacing	12.5 kHz Analog / TDMA
Audio Distortion	3%

Base Station Receiver

The base station receivers shall conform to the minimum standards specified by TIA/EIA-603, Section 4.1. The base station receivers shall further meet or exceed the following specifications.

Frequency Range	403-470 MHz
Analog Sensitivity (12 dB SINAD)	0.30 uV / .22uV (typical]
Digital Sensitivity	5% BER: 0.3 uV
Adjacent Channel Selectivity	65dB at 12.5 kHz @ (TIA603) 50dB at 12.5 kHz @ (TIA603C)
Spurious Rejection	75 dB
Audio Distortion	3%



OVERVIEW OF THE IP SITE CONNECT SYSTEM: DRAFT

A critical piece of an emergency plan is communication. Within a school system there must be communication to emergency response personnel, between the schools and throughout the school grounds. To achieve this communication goal we have proposed a Motorola Mototrbo Digital IP Site Connect System for the Westport Public School System. This solution uses the internet (radio over IP) to extend the school(s) radio coverage resulting in "wide" area communications.

The IP Site Connect System wide area uses the schools existing connectivity network that Westport already has in place. Presently, Westport Public Schools uses "local" radio communications only meaning each school communicates among themselves.

Westport will be adding digital radio equipment into each school which consists of digital repeaters and portable radios. The repeaters will be connecting to the schools with the fiber which will complete the build out of the "wide" area communications network. This network will allow for emergency communications from a single radio carrier to the PD as well as emergency contact from the BOE office.

The IP Site Connect System uses TDMA digital technology which provides the schools with two talk paths to the user 1)local communication at each school and 2)wide area communication which will be used for mass notification. The Westport Public Schools will designate one talkpath as the "Emergency Channel". The other talkpath will be used for "local" daily communication at the individual schools.

Designating an "emergency talkpath" will allow the Police Department and Fire Department's Dispatch Centers to monitor this channel. There will be no communications on this channel except for emergency. By a turn of the channel knob an educator can notify the PD/FD that there is a situation at their school. Digital radio communications is the future and the future is here now. The system proposed has the ability to grow within the district.

The system proposed consists of the following:

A. Digital Repeaters - will be installed as to provide all of the Westport BOE Schools (Staples High School, Bedford Middle, Coleytown Middle, Coletown, Greens Farms, Kings Highway, Long Lots, Saugatuck Schools and Board of Education Office) with appropriate coverage.

1. Staples High existing repeater will be reprogrammed for digital. Staples will be using 2 digital repeaters giving them four talk paths (1)emergency, (2)facilities, (3)administration, and (4)nurse/aids.

2. A combination of external and internal antenna will be installed to complete the RF requirements of each building. Small schools do not need the power of the outside antennas. These needs will be determined by the walk through.

B. Two Control Stations with emergency encode--Police Department, Fire Department and Board of Education Offices. The Superintendent has the capability of sending out an emergency alarm with voice to follow to all portable radios. The PD and FD Dispatch Center will be listening for emergency communications only.

C. Portable Radios:

1. Each school will have new digital portable radios.

D. Mobile Radios:

1. Five mobile radios will be needed--these radios can be installed into Security/Facility/BOE vehicles. Additional radios maybe needed. These radios give the drivers the capability to use the radio system.

NOTE: a future consideration can be to add the bus radios to the system

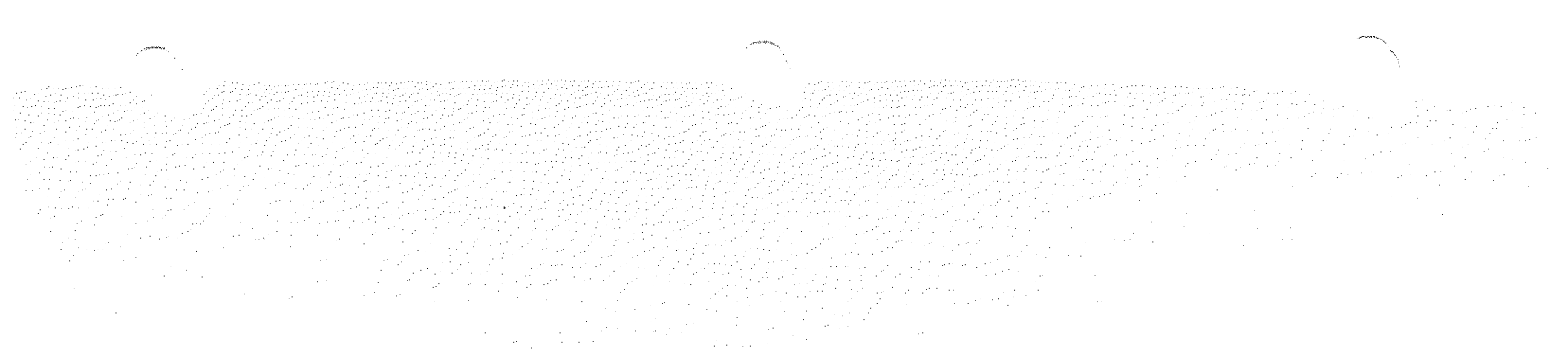
Westport Public Schools Responsibilities:

1. System requires a connectivity link to each school.
2. IP connection at the repeater location.
3. Provide - IP Address/Subnet for each repeater located at the schools.
4. Provide - IP Addresses for 109 Portable Radios and Mobile Radios

QUALIFIERS: DRAFT

MUST BE:

1. Have State of CT V9 License
2. Minimum ten (10) R-2 Certified Technicians
3. Motorola Certified Service/Sales Center
4. Minimum three (3) R56 Certified Journeyman
5. Motorola MCC5500 Trained and Certified Technicians - minimum three (3) (FD and PD dispatch)
6. Within a 45 mile/response time for repair
7. 24 hr/7 day repair - non-business hour response procedure in place
8. Provide name of Project Manager that will be assigned to this job
9. Minimum of five (5) IP Site Connect Systems installed - please provide references



PRICING SHEET:	DRAFT			
Quantity	**Part #**	**Equipment**	**Vendor**	**Unit Price**	**Extended Price**
A) Mototurbo Equipment					
1	FCC	Application/Coordination	?		
		(8repeater pair and 2 modify coordinations)			
1	Maps	Coverage Mapping	?		
10	AAM27QPR9JA7BN	XPR8400 UHF40watt	Motorola		
		Repeaters			
10	HFE8401	DS6336A2N UHF Duplexer	Motorola		
		450 to 470			
20	112004804	Cables for duplexer to	Motorola		
		pre-selector			
10	0112004U04	Cables for duplexer to	Motorola		
		Repeater			
10	HEF8459	UHF-Preselectors	Motorola		
10	PMLE4476	Wall Mount Kitsw/bracket	Motorola		
B)Battery Back-UP					
10	L1884	Battery Reverting Charger	Motorola		
		Battery Back-up			
10	Z692	Cable Interface, Battery	Motorola		
		to Charger			
10	Z691	Cable Interface, Station	Motorola		
		to Charger			
10	824A	Batteries	?		
10	THIN6701	30" Cabinet	Motorola		

C)Mototurbo Control Stations for Voice Transmit			
3	AAM27QPH9LA1_N	XPR4550 UHF 40-watt ch	Motorola
		with alphanumeric IP	
		Encode/Decode	
2	305637	Power Supply and Cable	?
1	RMN-5050	Desktop Microphones	Motorola
1	HKN-9557	Antenna Pigtails	Motorola
D)Antenna Systems			
TO BE DETERMINED AT WALK THROUGH			
E)Mototurbo Portable Radios			
190	AAH55QDC9LA1_N	XPR6350 UHF portable	Motorola
		radios no display,impress	
		charger with standard	
		accessories with	
		emergency encode	
F)Mototurbo Mobile Radios			
5	AAH56RDC9KA1_N	XPR7350 UHF 40-watt	Motorola
		32 channel Mobile Radio	
5	HAE-4003	UHF 1/4 wave antenna	Motorola
5	TMB-34	Trunk Mount L Brackets	?
G)Dispatch Consoles MCC5500 Add-ons			
2	L3358	Console Electronic Shelf II	Motorola
2	L3550	DAP II for analog, Astro	Motorola
		interface incl.2 licenses	

H)Installation Services										
Man/Hr		TO BE DETERMINED BY EACH CONTRACTOR FILLING THIS OUT								
I)Option-Contractor to supply a link capacity plus system in place of a IP Site Connect										
	Provide the software upgrade for each location									
	TOTAL COST _____									
J)NOTE										
	1)Contractor will be supplying the Westport PD and FD with a Control Station which will be									
	added to their MCC5500									
	2)Connectivity to each school location will be supplied by Town of Westport									