3

Edward Devotion School
MSBA
Preliminary Design Program

Brookline, Massachusetts

MARCH 2014

Volume 3 of 5

HMFH Architects, Inc.

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Volume 1

3.1.1 Introduction	Vol. I
3.1.2 Educational Program	Vol. I
3.1.3 Initial Space Summary	Vol. I
3.1.4 Evaluation of Existing Conditions	Vol. I
3.1.5 Site Development Requirements	Vol. I
3.1.6 Preliminary Evaluation of Alternatives	Vol. I
3.1.7 Local Actions and Approvals Appendicies	Vol. I

Volume 2

Appendix A – Statement of Interest and Capital Budget	Vol. II
Appendix B – Proposed Systems Narratives for Options	Vol. II

Table of Contents

Volume 3

Appendix C – Cost Estimate	Vol. III	7
Appendix D – Geotechnical Review	Vol. III	63
Appendix E – Environmental Report	Vol. III	91
Appendix F – Structural Review	Vol. III	127
Appendix G – MEP/FP Review	Vol. III	139
Appendix H – Hazardous Materials Survey	Vol. III	183
Appendix I – Architectual Alternative Options	Vol. III	223

Volume 4

Appendix J – Edward Devotion School Concept Study	Vol. IV

Volume 5

Appendix K – BSPACE Concept Study Report	Vol. V

Appendix C

Cost Estimate

Report 7

Feasibility Submission

Edward Devotion School

Feasibility Design Options

Brookline, MA

Prepared for:

HMFH Architects, Inc

March 17, 2014

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

MAIN CONSTRUCTION COST SUMMARY

	Construction Start	Gross Floor Area	$/sf	Estimated Construction Cost
OPTION 1.1 - RENOVATION/ADDITION				
RENOVATE EXISTING SCHOOL		40,906	$211.21	$8,639,689
ADDITIONS TO EXISTING BUILDING		147,528	$236.77	$34,929,998
NEW PARKING UNDER NEW ADDITION		19,262	$140.00	$2,696,680
DEMOLISH PORTIONS OF EXISTING BUILDING		121,145	$8.00	$969,160
REMOVE HAZARDOUS MATERIALS - Allowance		162,051	$10.49	$1,700,000
SITEWORK (10% of Building Costs)				$4,356,969
SUB-TOTAL	Apr-16	207,696	$256.59	$53,292,496
GENERAL CONDITIONS (C. 149)	10.00%			$5,329,250
BONDS	1.25%			$666,156
INSURANCE	1.00%			$532,925
PERMIT				NIC
OVERHEAD AND FEE	3%			$1,598,775
ESCALATION TO START - (assumed 3% PA)	6%			$3,197,550
DESIGN AND PRICING CONTINGENCY	15%			$9,692,573
PHASING PREMIUM	3.00%			$1,598,775
TOTAL OF ALL CONSTRUCTION OPTION 1.1	Apr-16	207,696	$365.48	**$75,908,500**

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Brookline, MA

17-Mar-14

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OPTION 1.4 - RENOVATION/ADDITION

RENOVATE EXISTING SCHOOL		40,906	$211.21	$8,639,689
ADDITIONS TO EXISTING BUILDING		144,839	$231.50	$33,530,235
NEW PARKING UNDER NEW ADDITION		19,262	$140.00	$2,696,680
DEMOLISH PORTIONS OF EXISTING BUILDING		121,145	$8.00	$969,160
REMOVE HAZARDOUS MATERIALS - Allowance		162,051	$10.49	$1,700,000
SITEWORK (10% of Building Costs)				$4,216,992
SUB-TOTAL	Apr-16	205,007	$252.44	$51,752,756
GENERAL CONDITIONS (C. 149)	10.00%			$5,175,276
BONDS	1.25%			$646,909
INSURANCE	1.00%			$517,528
PERMIT				NIC
OVERHEAD AND FEE	3%			$1,552,583
ESCALATION TO START - (assumed 3% PA)	6%			$3,105,165
DESIGN AND PRICING CONTINGENCY	15%			$9,412,533
PHASING PREMIUM	5.00%			$2,587,638
TOTAL OF ALL CONSTRUCTION OPTION 1.4	Apr-16	205,007	$364.62	**$74,750,388**

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Brookline, MA

17-Mar-14

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OPTION 2 - RENOVATION/ADDITION

RENOVATE EXISTING SCHOOL		40,906	$211.21	$8,639,689
ADDITIONS TO EXISTING BUILDING		146,791	$233.65	$34,297,862
NEW PARKING UNDER NEW ADDITION		19,262	$140.00	$2,696,680
DEMOLISH PORTIONS OF EXISTING BUILDING		121,145	$8.00	$969,160
REMOVE HAZARDOUS MATERIALS - Allowance		162,051	$10.49	$1,700,000
SITEWORK (10% of Building Costs)				$4,293,755
SUB-TOTAL	Apr-16	206,959	$254.14	$52,597,146
GENERAL CONDITIONS (C. 149)	10.00%			$5,259,715
BONDS	1.25%			$657,464
INSURANCE	1.00%			$525,971
PERMIT				NIC
OVERHEAD AND FEE	3%			$1,577,914
ESCALATION TO START - (assumed 3% PA)	6%			$3,155,829
DESIGN AND PRICING CONTINGENCY	15%			$9,566,106
PHASING PREMIUM	3.00%			$1,577,914
TOTAL OF ALL CONSTRUCTION OPTION 2	Apr-16	206,959	$361.99	**$74,918,059**

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Brookline, MA

17-Mar-14

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OPTION 3.2 - NEW BUILDING

NEW PARKING UNDER NEW BUILDING		21,525	$140.00	$3,013,500
DEMOLISH EXISTING BUILDING		162,051	$8.00	$1,296,408
NEW BUILDING		187,234	$223.19	$41,788,924
REMOVE HAZARDOUS MATERIALS - Allowance		162,051	$10.49	$1,700,000
SITEWORK (10% of Building Costs)				$4,609,883
SUB-TOTAL	Apr-16	208,759	$251.05	$52,408,715
GENERAL CONDITIONS (C. 149)	10.00%			$5,240,872
BONDS	1.25%			$655,109
INSURANCE	1.00%			$524,087
PERMIT				NIC
OVERHEAD AND FEE	3%			$1,572,261
ESCALATION TO START - (assumed 3% PA)	6%			$3,144,523
DESIGN AND PRICING CONTINGENCY	15%			$9,531,835
TOTAL OF ALL CONSTRUCTION OPTION 3.2	Apr-16	208,759	$350.06	**$73,077,402**

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Brookline, MA

17-Mar-14

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OPTION O - RENOVATION ONLY

RENOVATE EXISTING SCHOOL		162,051	$186.77	$30,266,009
REMOVE HAZARDOUS MATERIALS - Allowance		162,051	$10.49	$1,700,000
SITEWORK (10% of Building Costs)				$3,026,601
SUB-TOTAL	Apr-16	162,051	$215.94	$34,992,610
GENERAL CONDITIONS (C. 149)	10.00%			$3,499,261
BONDS	1.25%			$437,408
INSURANCE	1.00%			$349,926
PERMIT				NIC
OVERHEAD AND FEE	3%			$1,049,778
ESCALATION TO START - (assumed 3% PA)	6%			$2,099,557
DESIGN AND PRICING CONTINGENCY	15%			$6,364,281
PHASING PREMIUM	3.00%			$1,049,778
TOTAL OF ALL CONSTRUCTION OPTION O	Apr-16	162,051	$307.57	**$49,842,599**

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Brookline, MA

17-Mar-14

Feasibility Submission

This Feasibility cost estimate was produced from preliminary drawings, outline specifications and other documentation prepared by HMFH Architects Inc. and their design team dated March 7th, 2014. Design and engineering changes occurring subsequent to the issue of these documents have not been incorporated in this estimate.

This estimate includes all direct construction costs, general contractor's overhead and profit and design contingency. Cost escalation assumes start dates indicated above.

We have assumed procurement will utilize a public bid under C.149 of the MGL with public bidding to pre-qualified General Contractors and subcontractors, open specifications for materials and manufactures. If 149a CM at risk procurement is selected costs will likely be greater than those included in this report.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

Items not included in this estimate are:

- Land acquisition, feasibility, and financing costs
- All professional fees and insurance
- Site or existing conditions surveys investigations costs, including to determine subsoil conditions
- All Furnishings, Fixtures and Equipment
- Items identified in the design as Not In Contract (NIC)
- Items identified in the design as by others
- Owner supplied and/or installed items as indicated in the estimate
- Utility company back charges, including work required off-site
- Work to City streets and sidewalks, (except as noted in this estimate)
- Construction contingency

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Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 40,906

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
RENOVATION						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$81,812			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$79,163	**$160,975**	$3.94	1.9%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$163,812			
	B1020	Roof Construction	$41,500	**$205,312**	$5.02	2.4%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$222,744			
	B2020	Windows/Curtainwall	$295,194			
	B2030	Exterior Doors	$8,140	**$526,078**	$12.86	6.1%
B30	**ROOFING**					
	B3010	Roof Coverings	$935,083			
	B3020	Roof Openings	$11,000	**$946,083**	$23.13	11.0%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$736,308			
	C1020	Interior Doors	$163,624			
	C1030	Specialties/Millwork	$621,330	**$1,521,262**	$37.19	17.6%
C20	**STAIRCASES**					
	C2010	Stair Construction	$0			
	C2020	Stair Finishes	$0	**$0**	$0.00	0.0%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$368,154			
	C3020	Floor Finishes	$327,248			
	C3030	Ceiling Finishes	$245,436	**$940,838**	$23.00	10.9%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$140,000	**$140,000**	$3.42	1.6%
D20	**PLUMBING**					
	D20	Plumbing	$449,966	**$449,966**	$11.00	5.2%
D30	**HVAC**					
	D30	HVAC	$1,431,710	**$1,431,710**	$35.00	16.6%
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$204,530	**$204,530**	$5.00	2.4%
D50	**ELECTRICAL**					
	D5010	Electrical Systems	$1,113,556	**$1,113,556**	$27.22	12.9%

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Brookline, MA

17-Mar-14

Feasibility Submission

GFA 40,906

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
RENOVATION						
E10	**EQUIPMENT**					
	E10	Equipment	$360,000	**$360,000**	$8.80	4.2%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$241,510			
	E2020	Movable Furnishings	NIC	**$241,510**	$5.90	2.8%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**SELECTIVE BUILDING DEMOLITION**					
	F2010	Building Elements Demolition	$397,869			
	F2020	Hazardous Components Abatement	$0	**$397,869**	$9.73	4.6%
TOTAL DIRECT COST (Trade Costs)				***$8,639,689***	*$211.21*	*100.0%*

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Edward Devotion School 17-Mar-14
Feasibility Design Options
Brookline, MA

Feasibility Submission **GFA** 40,906

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	RENOVATION						
	GROSS FLOOR AREA CALCULATION						
	Ground			8,400			
	First Floor			14,742			
	Second Floor			14,742			
	Third Floor			3,022			
	TOTAL GROSS FLOOR AREA (GFA)				**40,906**	***sf***	
	A10 FOUNDATIONS						
A1010	**STANDARD FOUNDATIONS**						
	Allowance for new foundations for structural bracing and new interior walls etc.	**40,906**	sf	2.00	81,812		
	SUBTOTAL					**$81,812**	
A1020	**SPECIAL FOUNDATIONS**						
	No work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	Cut and Patching						
	Patch/level Existing slab on Grade at Lower level	**12,642**	sf	1.50	18,963		
	New Slabs for plumbing etc. at bathrooms and kitchen	**2,100**	sf	12.00	25,200		
	Miscellaneous Items						
	New elevator pit including cutting and patching	**1**	ls	25,000.00	25,000		
	Equipment pads	**1**	ls	10,000.00	10,000		
	SUBTOTAL					**$79,163**	
	TOTAL - FOUNDATIONS						**$160,975**
	B10 SUPERSTRUCTURE						
B1010	**FLOOR CONSTRUCTION**						
	CMU Seismic support/bracing	**40,906**	sf	2.00	81,812		
	New steel for bracing etc.; assumed 0.30 lbs per sf	**6**	tns	4,500.00	27,000		
	New penetrations to existing structure	**1**	ls	20,000.00	20,000		
	New penetrations to existing structure	**1**	ls	20,000.00	20,000		
	Fire stopping floors	**1**	ls	15,000.00	15,000		
	SUBTOTAL					**163,812**	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel allowance for new RTU's and snow loading reinforcement - assumed 1 lb per sf	**7**	tns	4,500.00	31,500		
	New openings in structure for elevator	**1**	loc	10,000.00	10,000		
	SUBTOTAL					**$41,500**	
	TOTAL - SUPERSTRUCTURE						**$205,312**
	B20 EXTERIOR CLOSURE						

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Edward Devotion School 17-Mar-14
Feasibility Design Options
Brookline, MA

Feasibility Submission **GFA** 40,906

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	RENOVATION						
54	**B2010 EXTERIOR WALLS**						
55	Exterior skin	*4,995*	*sf*		-		
56	Allowance to repoint/repair existing exterior masonry	**4,995**	sf	22.00	109,890		
57	GWB furred and Insulation - 3" thick to inside face of exterior wall	**4,995**	sf	9.25	46,204		
58	Repairs at façade of historic building	**1**	ls	50,000.00	50,000		
59	Miscellaneous						
60	Staging to exterior wall	**8,325**	sf	2.00	16,650		
61	SUBTOTAL					**$222,744**	
62							
63	**B2020 WINDOWS/CURTAINWALL**	*3,330*	*sf*		-		
64	Windows/Curtainwall/Storefront; replace with new	**3,330**	sf	85.00	283,050		
65	Louvers	**1**	ls	5,000.00	5,000		
66	Backer rod & double sealant	**1,099**	lf	4.00	4,396		
67	Wood blocking at openings	**1,099**	lf	2.50	2,748		
68	SUBTOTAL					**$295,194**	
69							
70	**B2030 EXTERIOR DOORS**						
71	Glazed entrance doors including frame and hardware; double door	**1**	pr	8,000.00	8,000		
72	Backer rod & double sealant	**20**	lf	4.00	80		
73	Wood blocking at openings	**20**	lf	3.00	60		
74	SUBTOTAL					**$8,140**	
75							
76	***TOTAL - EXTERIOR CLOSURE***						**$526,078**
77							
78							
79	***B30 ROOFING***						
80							
81	**B3010 ROOF COVERINGS**						
82	Sloped roofing						
83	Remove existing roof membrane	**23,640**	sf	2.00	47,280		
84	New slate roof	**23,640**	sf	26.00	614,640		
85	Insulation; R-30	**23,640**	sf	5.25	124,110		
86	1/2" dens-deck protection board	**23,640**	sf	1.50	35,460		
87	Reinforced vapor barrier	**23,640**	sf	0.45	10,638		
88	Miscellaneous Roofing						
89	Roof edge detail - fascia; repairs	**185**	lf	25.00	4,625		
90	Repairs to cupola	**1**	ls	80,000.00	80,000		
91	New snow fence	**1**	ls	10,000.00	10,000		
92	Roof edge blocking	**185**	lf	18.00	3,330		
93	Walk pads	**1**	ls	5,000.00	5,000		
94	SUBTOTAL					**$935,083**	
95							
96	**B3020 ROOF OPENINGS**						
97	Roof hatch	**2**	ea	2,500.00	5,000		
98	Roof ladders	**5**	ea	1,200.00	6,000		
99	SUBTOTAL					**$11,000**	
100							
101	***TOTAL - ROOFING***						**$946,083**
102							
103							
104	***C10 INTERIOR CONSTRUCTION***						
105							
106	**C1010 PARTITIONS**						

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Edward Devotion School 17-Mar-14
Feasibility Design Options
Brookline, MA

Feasibility Submission **GFA** 40,906

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	RENOVATION						
	New Interior partitions/rebuild existing	**40,906**	gsf	18.00	736,308		
	SUBTOTAL					**736,308**	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**40,906**	gsf	4.00	163,624		
	SUBTOTAL					**$163,624**	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**40,906**	gsf	0.80	32,725		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**40,906**	sf	0.70	28,634		
	Renovate existing auditorium to original double height space	**5,800**	sf	50.00	290,000		
	Renovate existing small gym	**2,500**	sf	20.00	50,000		
	Shelving in storage rooms	**1**	ls	10,000.00	10,000		
	Building directory	**1**	loc	3,000.00	3,000		
	Bronze dedication plaque	**1**	loc	2,500.00	2,500		
	Staff mailboxes/casework	**1**	ls	5,000.00	5,000		
	Room Signs	**40,906**	gsf	0.40	16,362		
	Fire extinguisher cabinets	**14**	ea	350.00	4,900		
	Lockers	**40,906**	gsf	1.60	65,450		
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		
	Janitors Closet Accessories	**3**	rms	300.00	900		
	Administration room						
	Reception desk	**1**	ls	21,000	21,000		
	Guidance						
	Reception Desk	**1**	ls	12,000	12,000		
	Display cases	**1**	ls	15,000	15,000		
	Miscellaneous metals throughout building	**40,906**	sf	1.00	40,906		
	Miscellaneous sealants throughout building	**40,906**	sf	0.50	20,453		
	SUBTOTAL					**$621,330**	
	TOTAL - INTERIOR CONSTRUCTION						**$1,521,262**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	No work in this section						
	SUBTOTAL						
C2020	**STAIR FINISHES**						
	No work in this section						
	SUBTOTAL						
	TOTAL - STAIRCASES						
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Wall finishes	**40,906**	sf	9.00	368,154		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission **GFA** 40,906

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		RENOVATION						
158		SUBTOTAL					**$368,154**	
159								
160	**C3020**	**FLOOR FINISHES**						
161		Floor finishes	**40,906**	sf	8.00	327,248		
162		SUBTOTAL					**327,248**	
163								
164	**C3030**	**CEILING FINISHES**						
165		Ceiling finishes	**40,906**	sf	6.00	245,436		
166		SUBTOTAL					**$245,436**	
167								
168		***TOTAL - INTERIOR FINISHES***						**$940,838**
169								
170								
171	***D10***	***CONVEYING SYSTEMS***						
172								
173		New elevator; four stops	**1**	loc	140,000.00	140,000		
174		SUBTOTAL					**140,000**	
175								
176		***TOTAL - CONVEYING SYSTEMS***						**$140,000**
177								
178								
179	***D20***	***PLUMBING***						
180								
181	**D20**	**PLUMBING, GENERALLY**						
182		Plumbing; replace fixtures and piping	**40,906**	gsf	11.00	449,966		
183		SUBTOTAL					**449,966**	
184								
185		***TOTAL - PLUMBING***						**$449,966**
186								
187								
188	***D30***	***HVAC***						
189								
190	**D30**	**HVAC, GENERALLY**						
191		New HVAC system; displacement	**40,906**	gsf	35.00	1,431,710		
192		SUBTOTAL					**1,431,710**	
193								
194		***TOTAL - HVAC***						**$1,431,710**
195								
196								
197	***D40***	***FIRE PROTECTION***						
198								
199	**D40**	**FIRE PROTECTION, GENERALLY**						
200		Fire protection system	**40,906**	gsf	5.00	204,530		
201		SUBTOTAL					**$204,530**	
202								
203		***TOTAL - FIRE PROTECTION***						**$204,530**
204								
205								
206	***D50***	***ELECTRICAL***						
207								
208	**D5010**	**SERVICE & DISTRIBUTION**						
209		Electrical system complete	**40,906**	gsf	26.00	1,063,556		
210		New electrical service vault	**1**	ls	50,000.00	50,000		
211		SUBTOTAL					**$1,113,556**	
212								
213								

Devotion School Study March 17th 2014 Page 13 PMC - Project Management Cost

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Edward Devotion School 17-Mar-14
Feasibility Design Options
Brookline, MA

Feasibility Submission **GFA** 40,906

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	RENOVATION						
	TOTAL - ELECTRICAL						**$1,113,556**
	E10 EQUIPMENT						
	E10 EQUIPMENT, GENERALLY						
	Food Service equipment	**1**	ls	350,000	350,000		
	Electrically operated projection screens	**2**	loc	5,000.00	10,000		
	SUBTOTAL					**$360,000**	
	TOTAL - EQUIPMENT						**$360,000**
	E20 FURNISHINGS						
	E2010 FIXED FURNISHINGS						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	45.00	9,000		
	Electrically Operated Shades in Media Rm.	**1**	ls	8,000.00	8,000		
	Window blinds	**3,330**	sf	6.00	19,980		
	Counters, base cabinets, tall storage in classrooms and other rooms	**40,906**	gsf	5.00	204,530		
	SUBTOTAL					**$241,510**	
	E2020 MOVABLE FURNISHINGS						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					**NIC**	
	TOTAL - FURNISHINGS						**$241,510**
	F10 SPECIAL CONSTRUCTION						
	F10 SPECIAL CONSTRUCTION						
	No items in this section						
	SUBTOTAL						
	TOTAL - SPECIAL CONSTRUCTION						
	F20 SELECTIVE BUILDING DEMOLITION						

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Brookline, MA

Feasibility Submission **GFA** 40,906

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		RENOVATION						
254	**F2010**	**BUILDING ELEMENTS DEMOLITION**						
255		Remove existing Windows/Curtainwall	**3,330**	sf	6.00	19,980		
256		Interior demolition	**40,906**	sf	6.50	265,889		
257		Remove floor to return auditorium to original two story space	**5,800**	sf	15.00	87,000		
258		Demolition at small gym	**2,500**	sf	10.00	25,000		
259		SUBTOTAL					**397,869**	
260								
261	**F2020**	**HAZARDOUS COMPONENTS ABATEMENT**						
262		See summary						
263		SUBTOTAL						
264								
265		***TOTAL - SELECTIVE BUILDING DEMOLITION***						**$397,869**
266								

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 1.1 NEW ADDITION						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$1,102,905			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$811,386	**$1,914,291**	$12.98	5.5%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$0			
	A2020	Basement Walls	$0	**$0**	$0.00	0.0%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$4,287,636			
	B1020	Roof Construction	$627,732	**$4,915,368**	$33.32	14.1%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$3,596,670			
	B2020	Windows	$2,306,567			
	B2030	Exterior Doors	$20,560	**$5,923,797**	$40.15	17.0%
B30	**ROOFING**					
	B3010	Roof Coverings	$587,662			
	B3020	Roof Openings	$2,500	**$590,162**	$4.00	1.7%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$2,950,560			
	C1020	Interior Doors	$590,112			
	C1030	Specialties/Millwork	$793,190	**$4,333,862**	$29.38	12.4%
C20	**STAIRCASES**					
	C2010	Stair Construction	$288,000			
	C2020	Stair Finishes	$65,446	**$353,446**	$2.40	1.0%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,327,752			
	C3020	Floor Finishes	$1,180,224			
	C3030	Ceiling Finishes	$885,168	**$3,393,144**	$23.00	9.7%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$160,000	**$160,000**	$1.08	0.5%
D20	**PLUMBING**					
	D20	Plumbing	$1,622,808	**$1,622,808**	$11.00	4.6%
D30	**HVAC**					
	D30	HVAC	$5,163,480	**$5,163,480**	$35.00	14.8%

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 1.1 NEW ADDITION						
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$797,640	**$797,640**	$5.41	2.3%
D50	**ELECTRICAL**					
	D5010	Complete System	$4,250,784	**$4,250,784**	$28.81	12.2%
E10	**EQUIPMENT**					
	E10	Equipment	$375,400	**$375,400**	$2.54	1.1%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,135,816			
	E2020	Movable Furnishings	NIC	**$1,135,816**	$7.70	3.3%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$34,929,998***	*$236.77*	*100.0%*

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.1	**NEW ADDITION**						
	GROSS FLOOR AREA CALCULATION						
	Basement (Parking) - Not included in overall GSF			19,262			
	Ground Floor			47,430			
	First Floor			32,622			
	Second Floor			33,738			
	Third Floor			33,738			
	TOTAL GROSS FLOOR AREA (GFA)				**147,528**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Premium for concrete retaining wall	**12,915**	sf	45.00	581,175		
	Foundation allowance	**47,430**	sf	11.00	521,730		
	SUBTOTAL					1,102,905	
A1020	**SPECIAL FOUNDATIONS**						
	No Work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**1,757**	cy	30.00	52,710		
	Rigid insulation	**47,430**	sf	1.87	88,694		
	Vapor barrier	**47,430**	sf	0.75	35,573		
	Waterproofing system	**47,430**	sf	6.50	308,295		
	Compact existing sub-grade	**47,430**	sf	0.50	23,715		
	Mesh reinforcing 15% lap	**54,545**	sf	0.80	43,636		
	Concrete - 5" thick; 4,000 psi	**775**	cy	120.00	93,000		
	Placing concrete	**775**	cy	45.00	34,875		
	Finishing and curing concrete	**47,430**	sf	1.50	71,145		
	Control joints - saw cut	**47,430**	sf	0.10	4,743		
	Miscellaneous						
	New elevator pit	**1**	ls	20,000.00	20,000		
	New loading dock	**1**	ls	30,000.00	30,000		
	Equipment pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$811,386	
	TOTAL - FOUNDATIONS						**$1,914,291**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	No Work in this section						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	No Work in this section						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.1	**NEW ADDITION**						
55							
56	***B10 SUPERSTRUCTURE***						
57		11	lbs/sf		-		
58	**B1010 FLOOR CONSTRUCTION**	819	tns		-		
59	Floor Structure - Steel:						
60	Steel beams and columns; 12 lbs per SF	**689**	tns	3,300.00	2,273,700		
61	Shear studs	**22,981**	ea	2.50	57,453		
62	Floor Structure						
63	2" 18 Ga. Metal galvanized floor Deck	**114,906**	sf	3.75	430,898		
64	WWF reinforcement	**132,142**	sf	0.80	105,714		
65	Concrete Fill to metal deck; 5-1/2" thick; Light Weight	**2,047**	cy	160.00	327,520		
66	Place and finish concrete	**114,906**	sf	2.00	229,812		
67	Rebar to decks	**34,472**	lbs	1.50	51,708		
68	Misc. angles	**1**	ls	20,000.00	20,000		
69	Waterproofing system and plaza above garage	**16,800**	sf	30.00	504,000		
70	Miscellaneous						
71	Premium for sloped balcony framing/guardrails etc.	**1**	ls	75,000.00	75,000		
72	Fire proofing to columns and beams	**114,906**	sf	1.80	206,831		
73	Fire stopping floors	**1**	ls	5,000.00	5,000		
74	SUBTOTAL					$4,287,636	
75							
76	**B1020 ROOF CONSTRUCTION**						
77	Roof Structure - Steel:						
78	Steel beams/Joists; allowance 8 lbs per SF	**130**	tns	3,300.00	429,000		
79	Roof Structure						
80	Acoustic deck at gym	**6,000**	sf	6.50	39,000		
81	1-1/2" 20 Ga. galvanized Metal Roof Deck	**26,622**	sf	3.50	93,177		
82	Miscellaneous						
83	Fire proofing to columns, beams and deck	**26,622**	sf	2.50	66,555		
84	SUBTOTAL					$627,732	
85							
86	***TOTAL - SUPERSTRUCTURE***						**$4,915,368**
87							
88							
89	***B20 EXTERIOR CLOSURE***						
90							
91	**B2010 EXTERIOR WALLS**	*61,357*	sf		-		
92	Interior skin						
93	6" metal stud backup	**61,357**	sf	7.00	429,499		
94	Insulation - 3" thick	**61,357**	sf	2.25	138,053		
95	Air barrier	**61,357**	sf	6.00	368,142		
96	Air barrier/flashing at windows	**8,678**	lf	6.00	52,068		
97	Gypsum Sheathing	**61,357**	sf	2.00	122,714		
98	Drywall lining to interior face of stud backup	**61,357**	sf	2.50	153,393		
99	Exterior skin						
100	New Exterior closure; Masonry to match existing	**61,357**	sf	35.00	2,147,495		
101	Miscellaneous						
102	Aluminum sign at main entrance	**1**	ls	10,000.00	10,000		
103	Staging to exterior wall	**87,653**	sf	2.00	175,306		
104	SUBTOTAL					$3,596,670	
105							
106	**B2020 WINDOWS**	*26,296*	sf		-		
107	Windows/Curtainwall/Storefront; replace with new	**26,296**	sf	85.00	2,235,160		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.1	**NEW ADDITION**						
	Louvers (allowance)	**250**	sf	60.00	15,000		
	Backer rod & double sealant	**8,678**	lf	4.00	34,712		
	Wood blocking at openings	**8,678**	lf	2.50	21,695		
	SUBTOTAL					$2,306,567	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**2**	pr	8,000.00	16,000		
	HM doors, frames and hardware- Double	**2**	pr	2,000.00	4,000		
	Backer rod & double sealant	**80**	lf	4.00	320		
	Wood blocking at openings	**80**	lf	3.00	240		
	SUBTOTAL					$20,560	
	TOTAL - EXTERIOR CLOSURE						**$5,923,797**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	Flat roofing						
	PVC roof membrane fully adhered	**32,622**	sf	7.00	228,354		
	Insulation; R-30	**32,622**	sf	5.50	179,421		
	1/2" dens-deck protection board	**32,622**	sf	1.50	48,933		
	Reinforced vapor barrier	**32,622**	sf	0.45	14,680		
	Rough blocking	**7,554**	lf	6.00	45,324		
	Miscellaneous Roofing						
	Roof fascia/cornice	**1,259**	lf	50.00	62,950		
	Roof ladder	**1**	ls	3,000.00	3,000		
	Walk pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$587,662	
B3020	**ROOF OPENINGS**						
	Roof hatch	**1**	loc	2,500.00	2,500		
	SUBTOTAL					$2,500	
	TOTAL - ROOFING						**$590,162**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	New Interior partitions	**147,528**	gsf	20.00	2,950,560		
	SUBTOTAL					$2,950,560	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**147,528**	gsf	4.00	590,112		
	SUBTOTAL					$590,112	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**147,528**	gsf	0.80	118,022		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**147,528**	sf	0.70	103,270		
	Room Signs	**147,528**	gsf	0.40	59,011		
	Fire extinguisher cabinets	**49**	ea	350.00	17,150		
	Lockers	**147,528**	gsf	1.60	236,045		
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.1	**NEW ADDITION**						
163	Janitors Closet Accessories	**3**	rms	300.00	900		
164	*Media*						
165	Reception desk at Media	**1**	ls	25,000	25,000		
166	Library shelving at perimeters 7' Tall				F,F & E		
167	Library shelving at perimeters 3' Tall				F,F & E		
168	Display cases	**1**	ls	10,000.00	10,000		
169	Miscellaneous metals throughout building	**147,528**	sf	1.00	147,528		
170	Miscellaneous sealants throughout building	**147,528**	sf	0.50	73,764		
171	SUBTOTAL					$793,190	
172							
173	***TOTAL - INTERIOR CONSTRUCTION***						**$4,333,862**
174							
175							
176	***C20 STAIRCASES***						
177							
178	**C2010 STAIR CONSTRUCTION**						
179	Metal pan stair; egress stair	**12**	flt	22,000.00	264,000		
180	Concrete fill to stairs	**12**	flt	2,000.00	24,000		
181	SUBTOTAL					$288,000	
182							
183	**C2020 STAIR FINISHES**						
184	High performance coating to stairs including all railings etc.	**12**	flt	3,000.00	36,000		
185	Rubber tile at stairs - landings	**200**	sf	10.00	2,000		
186	Rubber tile at stairs - treads & risers	**1,440**	lft	19.06	27,446		
187	SUBTOTAL					$65,446	
188							
189	***TOTAL - STAIRCASES***						**$353,446**
190							
191							
192	***C30 INTERIOR FINISHES***						
193							
194	**C3010 WALL FINISHES**						
195	Wall finishes	**147,528**	sf	9.00	1,327,752		
196	SUBTOTAL					$1,327,752	
197							
198	**C3020 FLOOR FINISHES**						
199	Floor finishes	**147,528**	sf	8.00	1,180,224		
200	SUBTOTAL					$1,180,224	
201							
202	**C3030 CEILING FINISHES**						
203	Ceiling finishes	**147,528**	sf	6.00	885,168		
204	SUBTOTAL					$885,168	
205							
206	***TOTAL - INTERIOR FINISHES***						**$3,393,144**
207							
208							
209	***D10 CONVEYING SYSTEMS***						
210							
211	**D1010 ELEVATOR**						
212	New elevator; 4 stop	**1**	ea	160,000.00	160,000		
213	SUBTOTAL					$160,000	
214							
215	***TOTAL - CONVEYING SYSTEMS***						**$160,000**
216							
217							
218	***D20 PLUMBING***						
219							
220	**D20 PLUMBING, GENERALLY**						
221	Plumbing	**147,528**	gsf	11.00	1,622,808		
222	SUBTOTAL					$1,622,808	

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.1 NEW ADDITION							
	TOTAL - PLUMBING						**$1,622,808**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	New HVAC system	**147,528**	gsf	35.00	5,163,480		
	SUBTOTAL					$5,163,480	
	TOTAL - HVAC						**$5,163,480**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Allowance for fire pump	**1**	ls	60,000.00	60,000		
	Fire protection system	**147,528**	gsf	5.00	737,640		
	SUBTOTAL					$797,640	
	TOTAL - FIRE PROTECTION						**$797,640**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Electrical system complete	**147,528**	gsf	28.00	4,130,784		
	New 30 KW PV system	**1**	ls	120,000.00	120,000		
	SUBTOTAL					$4,250,784	
	TOTAL - ELECTRICAL						**$4,250,784**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**8**	ea	9,800.00	78,400		
	Gymnasium dividing net; electrically operated	**1**	loc	45,000.00	45,000		
	Volleyball net and standards	**1**	ea	2,000.00	2,000		
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	150,000	150,000		
	Telescoping bleachers	**1**	ls	75,000.00	75,000		
	Electrically operated projection screens	**1**	loc	5,000.00	5,000		
	SUBTOTAL					$375,400	
	TOTAL - EQUIPMENT						**$375,400**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	45.00	9,000		
	Window blinds	**26,296**	sf	6.00	157,776		
	New seats at auditorium balcony	**140**	seat	260.00	36,400		
	Science classroom casework	**3**	rm	65,000.00	195,000		
	Counters, base cabinets, tall storage in classrooms and other rooms	**147,528**	gsf	5.00	737,640		
	SUBTOTAL					$1,135,816	
E2020	**MOVABLE FURNISHINGS**						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 147,528

	CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION 1.1	**NEW ADDITION**						
283		All movable furnishings to be provided and installed by owner						
284		SUBTOTAL					NIC	
285								
286		***TOTAL - FURNISHINGS***						**$1,135,816**
287								
288								
289	***F10***	***SPECIAL CONSTRUCTION***						
290								
291	**F10**	**SPECIAL CONSTRUCTION**						
292		No items in this section						
293		SUBTOTAL						
294								
295		***TOTAL - SPECIAL CONSTRUCTION***						
296								
297								
298	***F20***	***SELECTIVE BUILDING DEMOLITION***						
299								
300	**F2010**	**BUILDING ELEMENTS DEMOLITION**						
301		See main summary for demolition of existing buildings						
302		SUBTOTAL						
303								
304	**F2020**	**HAZARDOUS COMPONENTS ABATEMENT**						
305		See main summary for HazMat allowance				See Summary		
306		SUBTOTAL						
307								
308		***TOTAL - SELECTIVE BUILDING DEMOLITION***						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 1.4 NEW ADDITION						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$801,584			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$799,133	**$1,600,717**	$11.05	4.8%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$0			
	A2020	Basement Walls	$0	**$0**	$0.00	0.0%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$3,752,303			
	B1020	Roof Construction	$900,115	**$4,652,418**	$32.12	13.9%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$3,239,212			
	B2020	Windows	$2,078,160			
	B2030	Exterior Doors	$20,560	**$5,337,932**	$36.85	15.9%
B30	**ROOFING**					
	B3010	Roof Coverings	$790,642			
	B3020	Roof Openings	$2,500	**$793,142**	$5.48	2.4%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$2,896,780			
	C1020	Interior Doors	$579,356			
	C1030	Specialties/Millwork	$779,395	**$4,255,531**	$29.38	12.7%
C20	**STAIRCASES**					
	C2010	Stair Construction	$240,000			
	C2020	Stair Finishes	$54,872	**$294,872**	$2.04	0.9%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,303,551			
	C3020	Floor Finishes	$1,158,712			
	C3030	Ceiling Finishes	$869,034	**$3,331,297**	$23.00	9.9%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$160,000	**$160,000**	$1.10	0.5%
D20	**PLUMBING**					
	D20	Plumbing	$1,593,229	**$1,593,229**	$11.00	4.8%
D30	**HVAC**					
	D30	HVAC	$5,069,365	**$5,069,365**	$35.00	15.1%

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 1.4 NEW ADDITION						
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$784,195	**$784,195**	$5.41	2.3%
D50	**ELECTRICAL**					
	D5010	Complete System	$4,175,492	**$4,175,492**	$28.83	12.5%
E10	**EQUIPMENT**					
	E10	Equipment	$375,400	**$375,400**	$2.59	1.1%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,106,645			
	E2020	Movable Furnishings	NIC	**$1,106,645**	$7.64	3.3%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$33,530,235***	*$231.50*	*100.0%*

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.4	**NEW ADDITION**						
	GROSS FLOOR AREA CALCULATION						
	Basement (Parking) - Not included in overall GSF			19,262			
	Ground Floor			28,313			
	First Floor			46,669			
	Second Floor			34,450			
	Third Floor			35,407			
	TOTAL GROSS FLOOR AREA (GFA)				**144,839**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Premium for concrete retaining wall	**6,405**	sf	45.00	288,225		
	Foundation allowance	**46,669**	sf	11.00	513,359		
	SUBTOTAL					801,584	
A1020	**SPECIAL FOUNDATIONS**						
	No Work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**1,728**	cy	30.00	51,840		
	Rigid insulation	**46,669**	sf	1.87	87,271		
	Vapor barrier	**46,669**	sf	0.75	35,002		
	Waterproofing system	**46,669**	sf	6.50	303,349		
	Compact existing sub-grade	**46,669**	sf	0.50	23,335		
	Mesh reinforcing 15% lap	**53,669**	sf	0.80	42,935		
	Concrete - 5" thick; 4,000 psi	**762**	cy	120.00	91,440		
	Placing concrete	**762**	cy	45.00	34,290		
	Finishing and curing concrete	**46,669**	sf	1.50	70,004		
	Control joints - saw cut	**46,669**	sf	0.10	4,667		
	Miscellaneous						
	New elevator pit	**1**	ls	20,000.00	20,000		
	New loading dock	**1**	ls	30,000.00	30,000		
	Equipment pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$799,133	
	TOTAL - FOUNDATIONS						**$1,600,717**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	No Work in this section						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	No Work in this section						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION 1.4 NEW ADDITION						
	B10 SUPERSTRUCTURE						
		11	lbs/sf		-		
B1010	**FLOOR CONSTRUCTION**	776	tns		-		
	Floor Structure - Steel:						
	Steel beams and columns; 12 lbs per SF	**589**	tns	3,300.00	1,943,700		
	Shear studs	**19,634**	ea	2.50	49,085		
	Floor Structure						
	2" 18 Ga. Metal galvanized floor Deck	**98,170**	sf	3.75	368,138		
	WWF reinforcement	**112,896**	sf	0.80	90,317		
	Concrete Fill to metal deck; 5-1/2" thick; Light Weight	**1,749**	cy	160.00	279,840		
	Place and finish concrete	**98,170**	sf	2.00	196,340		
	Rebar to decks	**29,451**	lbs	1.50	44,177		
	Misc. angles	**1**	ls	20,000.00	20,000		
	Waterproofing system and plaza above garage	**16,800**	sf	30.00	504,000		
	Miscellaneous						
	Premium for sloped balcony framing/guardrails etc.	**1**	ls	75,000.00	75,000		
	Fire proofing to columns and beams	**98,170**	sf	1.80	176,706		
	Fire stopping floors	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$3,752,303	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel beams/Joists; allowance 8 lbs per SF	**187**	tns	3,300.00	617,100		
	Roof Structure						
	Acoustic deck at gym	**6,000**	sf	6.50	39,000		
	1-1/2" 20 Ga. galvanized Metal Roof Deck	**40,669**	sf	3.50	142,342		
	Miscellaneous						
	Fire proofing to columns, beams and deck	**40,669**	sf	2.50	101,673		
	SUBTOTAL					$900,115	
	TOTAL - SUPERSTRUCTURE						**$4,652,418**
	B20 EXTERIOR CLOSURE						
B2010	**EXTERIOR WALLS**	*55,242*	sf		-		
	Interior skin						
	6" metal stud backup	**55,242**	sf	7.00	386,694		
	Insulation - 3" thick	**55,242**	sf	2.25	124,295		
	Air barrier	**55,242**	sf	6.00	331,452		
	Air barrier/flashing at windows	**7,813**	lf	6.00	46,878		
	Gypsum Sheathing	**55,242**	sf	2.00	110,484		
	Drywall lining to interior face of stud backup	**55,242**	sf	2.50	138,105		
	Exterior skin						
	New Exterior closure; Masonry to match existing	**55,242**	sf	35.00	1,933,470		
	Miscellaneous						
	Aluminum sign at main entrance	**1**	ls	10,000.00	10,000		
	Staging to exterior wall	**78,917**	sf	2.00	157,834		
	SUBTOTAL					$3,239,212	
B2020	**WINDOWS**	*23,675*	sf		-		
	Windows/Curtainwall/Storefront; replace with new	**23,675**	sf	85.00	2,012,375		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.4	**NEW ADDITION**						
	Louvers (allowance)	**250**	sf	60.00	15,000		
	Backer rod & double sealant	**7,813**	lf	4.00	31,252		
	Wood blocking at openings	**7,813**	lf	2.50	19,533		
	SUBTOTAL					$2,078,160	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**2**	pr	8,000.00	16,000		
	HM doors, frames and hardware- Double	**2**	pr	2,000.00	4,000		
	Backer rod & double sealant	**80**	lf	4.00	320		
	Wood blocking at openings	**80**	lf	3.00	240		
	SUBTOTAL					$20,560	
	TOTAL - EXTERIOR CLOSURE						**$5,337,932**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	Flat roofing						
	PVC roof membrane fully adhered	**46,669**	sf	7.00	326,683		
	Insulation; R-30	**46,669**	sf	5.50	256,680		
	1/2" dens-deck protection board	**46,669**	sf	1.50	70,004		
	Reinforced vapor barrier	**46,669**	sf	0.45	21,001		
	Rough blocking	**7,554**	lf	6.00	45,324		
	Miscellaneous Roofing						
	Roof fascia/cornice	**1,259**	lf	50.00	62,950		
	Roof ladder	**1**	ls	3,000.00	3,000		
	Walk pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$790,642	
B3020	**ROOF OPENINGS**						
	Roof hatch	**1**	loc	2,500.00	2,500		
	SUBTOTAL					$2,500	
	TOTAL - ROOFING						**$793,142**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	New Interior partitions	**144,839**	gsf	20.00	2,896,780		
	SUBTOTAL					$2,896,780	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**144,839**	gsf	4.00	579,356		
	SUBTOTAL					$579,356	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**144,839**	gsf	0.80	115,871		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**144,839**	sf	0.70	101,387		
	Room Signs	**144,839**	gsf	0.40	57,936		
	Fire extinguisher cabinets	**48**	ea	350.00	16,800		
	Lockers	**144,839**	gsf	1.60	231,742		
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.4	**NEW ADDITION**						
	Janitors Closet Accessories	**3**	rms	300.00	900		
	Media						
	Reception desk at Media	**1**	ls	25,000	25,000		
	Library shelving at perimeters 7' Tall				F,F & E		
	Library shelving at perimeters 3' Tall				F,F & E		
	Display cases	**1**	ls	10,000.00	10,000		
	Miscellaneous metals throughout building	**144,839**	sf	1.00	144,839		
	Miscellaneous sealants throughout building	**144,839**	sf	0.50	72,420		
	SUBTOTAL					$779,395	
	TOTAL - INTERIOR CONSTRUCTION						**$4,255,531**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	Metal pan stair; egress stair	**10**	flt	22,000.00	220,000		
	Concrete fill to stairs	**10**	flt	2,000.00	20,000		
	SUBTOTAL					$240,000	
C2020	**STAIR FINISHES**						
	High performance coating to stairs including all railings etc.	**10**	flt	3,000.00	30,000		
	Rubber tile at stairs - landings	**200**	sf	10.00	2,000		
	Rubber tile at stairs - treads & risers	**1,200**	lft	19.06	22,872		
	SUBTOTAL					$54,872	
	TOTAL - STAIRCASES						**$294,872**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Wall finishes	**144,839**	sf	9.00	1,303,551		
	SUBTOTAL					$1,303,551	
C3020	**FLOOR FINISHES**						
	Floor finishes	**144,839**	sf	8.00	1,158,712		
	SUBTOTAL					$1,158,712	
C3030	**CEILING FINISHES**						
	Ceiling finishes	**144,839**	sf	6.00	869,034		
	SUBTOTAL					$869,034	
	TOTAL - INTERIOR FINISHES						**$3,331,297**
D10	***CONVEYING SYSTEMS***						
D1010	**ELEVATOR**						
	New elevator; 4 stop	**1**	ea	160,000.00	160,000		
	SUBTOTAL					$160,000	
	TOTAL - CONVEYING SYSTEMS						**$160,000**
D20	***PLUMBING***						
D20	**PLUMBING, GENERALLY**						
	Plumbing	**144,839**	gsf	11.00	1,593,229		
	SUBTOTAL					$1,593,229	

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.4	**NEW ADDITION**						
	TOTAL - PLUMBING						**$1,593,229**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	New HVAC system	**144,839**	gsf	35.00	5,069,365		
	SUBTOTAL					$5,069,365	
	TOTAL - HVAC						**$5,069,365**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Allowance for fire pump	**1**	ls	60,000.00	60,000		
	Fire protection system	**144,839**	gsf	5.00	724,195		
	SUBTOTAL					$784,195	
	TOTAL - FIRE PROTECTION						**$784,195**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Electrical system complete	**144,839**	gsf	28.00	4,055,492		
	New 30 KW PV system	**1**	ls	120,000.00	120,000		
	SUBTOTAL					$4,175,492	
	TOTAL - ELECTRICAL						**$4,175,492**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**8**	ea	9,800.00	78,400		
	Gymnasium dividing net; electrically operated	**1**	loc	45,000.00	45,000		
	Volleyball net and standards	**1**	ea	2,000.00	2,000		
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	150,000	150,000		
	Telescoping bleachers	**1**	ls	75,000.00	75,000		
	Electrically operated projection screens	**1**	loc	5,000.00	5,000		
	SUBTOTAL					$375,400	
	TOTAL - EQUIPMENT						**$375,400**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	45.00	9,000		
	Window blinds	**23,675**	sf	6.00	142,050		
	New seats at auditorium balcony	**140**	seat	260.00	36,400		
	Science classroom casework	**3**	rm	65,000.00	195,000		
	Counters, base cabinets, tall storage in classrooms and other rooms	**144,839**	gsf	5.00	724,195		
	SUBTOTAL					$1,106,645	
E2020	**MOVABLE FURNISHINGS**						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 144,839

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 1.4	**NEW ADDITION**						
284	All movable furnishings to be provided and installed by owner						
285	SUBTOTAL					NIC	
286							
287	***TOTAL - FURNISHINGS***						**$1,106,645**
288							
289							
290	***F10 SPECIAL CONSTRUCTION***						
291							
292	**F10 SPECIAL CONSTRUCTION**						
293	No items in this section						
294	SUBTOTAL						
295							
296	***TOTAL - SPECIAL CONSTRUCTION***						
297							
298							
299	***F20 SELECTIVE BUILDING DEMOLITION***						
300							
301	**F2010 BUILDING ELEMENTS DEMOLITION**						
302	See main summary for demolition of existing buildings						
303	SUBTOTAL						
304							
305	**F2020 HAZARDOUS COMPONENTS ABATEMENT**						
306	See main summary for HazMat allowance				See Summary		
307	SUBTOTAL						
308							
309	***TOTAL - SELECTIVE BUILDING DEMOLITION***						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 2	**NEW ADDITION**					
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$734,717			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$621,086	**$1,355,803**	$9.24	4.0%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$0			
	A2020	Basement Walls	$0	**$0**	$0.00	0.0%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$4,575,621			
	B1020	Roof Construction	$444,187	**$5,019,808**	$34.20	14.6%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$3,275,104			
	B2020	Windows	$2,101,080			
	B2030	Exterior Doors	$20,560	**$5,396,744**	$36.76	15.7%
B30	**ROOFING**					
	B3010	Roof Coverings	$629,207			
	B3020	Roof Openings	$2,500	**$631,707**	$4.30	1.8%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$2,935,820			
	C1020	Interior Doors	$587,164			
	C1030	Specialties/Millwork	$789,506	**$4,312,490**	$29.38	12.6%
C20	**STAIRCASES**					
	C2010	Stair Construction	$240,000			
	C2020	Stair Finishes	$54,872	**$294,872**	$2.01	0.9%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,321,119			
	C3020	Floor Finishes	$1,174,328			
	C3030	Ceiling Finishes	$880,746	**$3,376,193**	$23.00	9.8%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$160,000	**$160,000**	$1.09	0.5%
D20	**PLUMBING**					
	D20	Plumbing	$1,614,701	**$1,614,701**	$11.00	4.7%
D30	**HVAC**					
	D30	HVAC	$5,284,476	**$5,284,476**	$36.00	15.4%

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 2	**NEW ADDITION**					
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$833,955	**$833,955**	$5.68	2.4%
D50	**ELECTRICAL**					
	D5010	Complete System	$4,523,730	**$4,523,730**	$30.82	13.2%
E10	**EQUIPMENT**					
	E10	Equipment	$375,400	**$375,400**	$2.56	1.1%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,117,983			
	E2020	Movable Furnishings	NIC	**$1,117,983**	$7.62	3.3%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$34,297,862***	*$233.65*	*100.0%*

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	GROSS FLOOR AREA CALCULATION						
	Basement (Parking) - Not included in overall GSF			19,262			
	Ground Floor			35,497			
	First Floor			22,931			
	Second Floor			30,291			
	Third Floor			30,291			
	Fourth Floor			27,781			
	TOTAL GROSS FLOOR AREA (GFA)				**146,791**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Premium for concrete retaining wall	**7,650**	sf	45.00	344,250		
	Foundation allowance	**35,497**	sf	11.00	390,467		
	SUBTOTAL					734,717	
A1020	**SPECIAL FOUNDATIONS**						
	No Work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**1,315**	cy	30.00	39,450		
	Rigid insulation	**35,497**	sf	1.87	66,379		
	Vapor barrier	**35,497**	sf	0.75	26,623		
	Waterproofing system	**35,497**	sf	6.50	230,731		
	Compact existing sub-grade	**35,497**	sf	0.50	17,749		
	Mesh reinforcing 15% lap	**40,822**	sf	0.80	32,658		
	Concrete - 5" thick; 4,000 psi	**580**	cy	120.00	69,600		
	Placing concrete	**580**	cy	45.00	26,100		
	Finishing and curing concrete	**35,497**	sf	1.50	53,246		
	Control joints - saw cut	**35,497**	sf	0.10	3,550		
	Miscellaneous						
	New elevator pit	**1**	ls	20,000.00	20,000		
	New loading dock	**1**	ls	30,000.00	30,000		
	Equipment pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$621,086	
	TOTAL - FOUNDATIONS						**$1,355,803**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	No Work in this section						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	No Work in this section						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2	**NEW ADDITION**						
B10	***SUPERSTRUCTURE***						
		11	lbs/sf		-		
B1010	**FLOOR CONSTRUCTION**	835	tns		-		
	Floor Structure - Steel:						
	Steel beams and columns; 12 lbs per SF	**743**	tns	3,300.00	2,451,900		
	Shear studs	**24,772**	ea	2.50	61,930		
	Floor Structure						
	2" 18 Ga. Metal galvanized floor Deck	**123,860**	sf	3.75	464,475		
	WWF reinforcement	**142,439**	sf	0.80	113,951		
	Concrete Fill to metal deck; 5-1/2" thick; Light Weight	**2,206**	cy	160.00	352,960		
	Place and finish concrete	**123,860**	sf	2.00	247,720		
	Rebar to decks	**37,158**	lbs	1.50	55,737		
	Misc. angles	**1**	ls	20,000.00	20,000		
	Waterproofing system and plaza above garage	**16,800**	sf	30.00	504,000		
	Miscellaneous						
	Premium for sloped balcony framing/guardrails etc.	**1**	ls	75,000.00	75,000		
	Fire proofing to columns and beams	**123,860**	sf	1.80	222,948		
	Fire stopping floors	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$4,575,621	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel beams/Joists; allowance 8 lbs per SF	**92**	tns	3,300.00	303,600		
	Roof Structure						
	Acoustic deck at gym	**6,000**	sf	6.50	39,000		
	1-1/2" 20 Ga. galvanized Metal Roof Deck	**16,931**	sf	3.50	59,259		
	Miscellaneous						
	Fire proofing to columns, beams and deck	**16,931**	sf	2.50	42,328		
	SUBTOTAL					$444,187	
	TOTAL - SUPERSTRUCTURE						**$5,019,808**
B20	***EXTERIOR CLOSURE***						
B2010	**EXTERIOR WALLS**	*55,856*	sf		-		
	Interior skin						
	6" metal stud backup	**55,856**	sf	7.00	390,992		
	Insulation - 3" thick	**55,856**	sf	2.25	125,676		
	Air barrier	**55,856**	sf	6.00	335,136		
	Air barrier/flashing at windows	**7,900**	lf	6.00	47,400		
	Gypsum Sheathing	**55,856**	sf	2.00	111,712		
	Drywall lining to interior face of stud backup	**55,856**	sf	2.50	139,640		
	Exterior skin						
	New Exterior closure; Masonry to match existing	**55,856**	sf	35.00	1,954,960		
	Miscellaneous						
	Aluminum sign at main entrance	**1**	ls	10,000.00	10,000		
	Staging to exterior wall	**79,794**	sf	2.00	159,588		
	SUBTOTAL					$3,275,104	
B2020	**WINDOWS**	*23,938*	sf		-		

PM&C

Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Windows/Curtainwall/Storefront; replace with new	**23,938**	sf	85.00	2,034,730		
	Louvers (allowance)	**250**	sf	60.00	15,000		
	Backer rod & double sealant	**7,900**	lf	4.00	31,600		
	Wood blocking at openings	**7,900**	lf	2.50	19,750		
	SUBTOTAL					$2,101,080	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**2**	pr	8,000.00	16,000		
	HM doors, frames and hardware- Double	**2**	pr	2,000.00	4,000		
	Backer rod & double sealant	**80**	lf	4.00	320		
	Wood blocking at openings	**80**	lf	3.00	240		
	SUBTOTAL					$20,560	
	TOTAL - EXTERIOR CLOSURE						**$5,396,744**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	Flat roofing						
	PVC roof membrane fully adhered	**35,497**	sf	7.00	248,479		
	Insulation; R-30	**35,497**	sf	5.50	195,234		
	1/2" dens-deck protection board	**35,497**	sf	1.50	53,246		
	Reinforced vapor barrier	**35,497**	sf	0.45	15,974		
	Rough blocking	**7,554**	lf	6.00	45,324		
	Miscellaneous Roofing						
	Roof fascia/cornice	**1,259**	lf	50.00	62,950		
	Roof ladder	**1**	ls	3,000.00	3,000		
	Walk pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$629,207	
B3020	**ROOF OPENINGS**						
	Roof hatch	**1**	loc	2,500.00	2,500		
	SUBTOTAL					$2,500	
	TOTAL - ROOFING						**$631,707**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	New Interior partitions	**146,791**	gsf	20.00	2,935,820		
	SUBTOTAL					$2,935,820	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**146,791**	gsf	4.00	587,164		
	SUBTOTAL					$587,164	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**146,791**	gsf	0.80	117,433		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**146,791**	sf	0.70	102,754		
	Room Signs	**146,791**	gsf	0.40	58,716		
	Fire extinguisher cabinets	**49**	ea	350.00	17,150		
	Lockers	**146,791**	gsf	1.60	234,866		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		
	Janitors Closet Accessories	**3**	rms	300.00	900		
	Media						
	Reception desk at Media	**1**	ls	25,000	25,000		
	Library shelving at perimeters 7' Tall				F,F & E		
	Library shelving at perimeters 3' Tall				F,F & E		
	Display cases	**1**	ls	10,000.00	10,000		
	Miscellaneous metals throughout building	**146,791**	sf	1.00	146,791		
	Miscellaneous sealants throughout building	**146,791**	sf	0.50	73,396		
	SUBTOTAL					$789,506	
	TOTAL - INTERIOR CONSTRUCTION						**$4,312,490**
C20	***STAIRCASES***						
C2010	**STAIR CONSTRUCTION**						
	Metal pan stair; egress stair	**10**	flt	22,000.00	220,000		
	Concrete fill to stairs	**10**	flt	2,000.00	20,000		
	SUBTOTAL					$240,000	
C2020	**STAIR FINISHES**						
	High performance coating to stairs including all railings etc.	**10**	flt	3,000.00	30,000		
	Rubber tile at stairs - landings	**200**	sf	10.00	2,000		
	Rubber tile at stairs - treads & risers	**1,200**	lft	19.06	22,872		
	SUBTOTAL					$54,872	
	TOTAL - STAIRCASES						**$294,872**
C30	***INTERIOR FINISHES***						
C3010	**WALL FINISHES**						
	Wall finishes	**146,791**	sf	9.00	1,321,119		
	SUBTOTAL					$1,321,119	
C3020	**FLOOR FINISHES**						
	Floor finishes	**146,791**	sf	8.00	1,174,328		
	SUBTOTAL					$1,174,328	
C3030	**CEILING FINISHES**						
	Ceiling finishes	**146,791**	sf	6.00	880,746		
	SUBTOTAL					$880,746	
	TOTAL - INTERIOR FINISHES						**$3,376,193**
D10	***CONVEYING SYSTEMS***						
D1010	**ELEVATOR**						
	New elevator; 4 stop	**1**	ea	160,000.00	160,000		
	SUBTOTAL					$160,000	
	TOTAL - CONVEYING SYSTEMS						**$160,000**
D20	***PLUMBING***						
D20	**PLUMBING, GENERALLY**						
	Plumbing	**146,791**	gsf	11.00	1,614,701		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
	SUBTOTAL					$1,614,701	
	TOTAL - PLUMBING						**$1,614,701**
D30	***HVAC***						
D30	**HVAC, GENERALLY**						
	New HVAC system; high rise premium	**146,791**	gsf	36.00	5,284,476		
	SUBTOTAL					$5,284,476	
	TOTAL - HVAC						**$5,284,476**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Allowance for fire pump; high rise premium	**1**	ls	100,000.00	100,000		
	Fire protection system	**146,791**	gsf	5.00	733,955		
	SUBTOTAL					$833,955	
	TOTAL - FIRE PROTECTION						**$833,955**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Electrical system complete; High Rise Premium	**146,791**	gsf	30.00	4,403,730		
	New 30 KW PV system	**1**	ls	120,000.00	120,000		
	SUBTOTAL					$4,523,730	
	TOTAL - ELECTRICAL						**$4,523,730**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**8**	ea	9,800.00	78,400		
	Gymnasium dividing net; electrically operated	**1**	loc	45,000.00	45,000		
	Volleyball net and standards	**1**	ea	2,000.00	2,000		
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	150,000	150,000		
	Telescoping bleachers	**1**	ls	75,000.00	75,000		
	Electrically operated projection screens	**1**	loc	5,000.00	5,000		
	SUBTOTAL					$375,400	
	TOTAL - EQUIPMENT						**$375,400**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	45.00	9,000		
	Window blinds	**23,938**	sf	6.00	143,628		
	New seats at auditorium balcony	**140**	seat	260.00	36,400		
	Science classroom casework	**3**	rm	65,000.00	195,000		
	Counters, base cabinets, tall storage in classrooms and other rooms	**146,791**	gsf	5.00	733,955		
	SUBTOTAL					$1,117,983	

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission GFA 146,791

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 2 NEW ADDITION							
282							
283 **E2020**	**MOVABLE FURNISHINGS**						
284	All movable furnishings to be provided and installed by owner						
285	SUBTOTAL					NIC	
286							
287	***TOTAL - FURNISHINGS***						**$1,117,983**
288							
289							
290 ***F10***	***SPECIAL CONSTRUCTION***						
291							
292 **F10**	**SPECIAL CONSTRUCTION**						
293	No items in this section						
294	SUBTOTAL						
295							
296	***TOTAL - SPECIAL CONSTRUCTION***						
297							
298							
299 ***F20***	***SELECTIVE BUILDING DEMOLITION***						
300							
301 **F2010**	**BUILDING ELEMENTS DEMOLITION**						
302	See main summary for demolition of existing buildings						
303	SUBTOTAL						
304							
305 **F2020**	**HAZARDOUS COMPONENTS ABATEMENT**						
306	See main summary for HazMat allowance				See Summary		
307	SUBTOTAL						
308							
309	***TOTAL - SELECTIVE BUILDING DEMOLITION***						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 3.2 NEW BUILDING						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$813,925			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$618,625	**$1,432,550**	$7.65	3.4%
A20	**BASEMENT CONSTRUCTION**					
	A2010	Basement Excavation	$0			
	A2020	Basement Walls	$0	**$0**	$0.00	0.0%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$4,999,849			
	B1020	Roof Construction	$1,068,000	**$6,067,849**	$32.41	14.5%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$3,560,778			
	B2020	Windows	$2,283,647			
	B2030	Exterior Doors	$36,840	**$5,881,265**	$31.41	14.1%
B30	**ROOFING**					
	B3010	Roof Coverings	$937,530			
	B3020	Roof Openings	$2,500	**$940,030**	$5.02	2.2%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$3,744,680			
	C1020	Interior Doors	$748,936			
	C1030	Specialties/Millwork	$1,036,270	**$5,529,886**	$29.53	13.2%
C20	**STAIRCASES**					
	C2010	Stair Construction	$360,000			
	C2020	Stair Finishes	$81,308	**$441,308**	$2.36	1.1%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,685,106			
	C3020	Floor Finishes	$1,497,872			
	C3030	Ceiling Finishes	$1,123,404	**$4,306,382**	$23.00	10.3%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$160,000	**$160,000**	$0.85	0.4%
D20	**PLUMBING**					
	D20	Plumbing	$2,059,574	**$2,059,574**	$11.00	4.9%
D30	**HVAC**					
	D30	HVAC	$6,553,190	**$6,553,190**	$35.00	15.7%

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION 3.2 NEW BUILDING						
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$996,170	**$996,170**	$5.32	2.4%
D50	**ELECTRICAL**					
	D5010	Complete System	$5,362,552	**$5,362,552**	$28.64	12.8%
E10	**EQUIPMENT**					
	E10	Equipment	$725,400	**$725,400**	$3.87	1.7%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$1,332,768			
	E2020	Movable Furnishings	NIC	**$1,332,768**	$7.12	3.2%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**HAZMAT REMOVALS**					
	F2010	Building Elements Demolition	$0			
	F2020	Hazardous Components Abatement	$0	**$0**	$0.00	0.0%
TOTAL DIRECT COST (Trade Costs)				***$41,788,924***	*$223.19*	*100.0%*

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
	GROSS FLOOR AREA CALCULATION						
	Basement (Parking) - Not included in overall GSF			21,525			
	Ground Floor			35,350			
	First Floor			55,400			
	Second Floor			51,163			
	Third Floor			45,321			
	TOTAL GROSS FLOOR AREA (GFA)				**187,234**	***sf***	
A10	***FOUNDATIONS***						
A1010	**STANDARD FOUNDATIONS**						
	Premium for concrete retaining wall	**4,545**	sf	45.00	204,525		
	Foundation allowance	**55,400**	sf	11.00	609,400		
	SUBTOTAL					813,925	
A1020	**SPECIAL FOUNDATIONS**						
	No Work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	New Slab on grade, 5" thick						
	Gravel fill, 12"	**1,309**	cy	30.00	39,270		
	Rigid insulation	**35,350**	sf	1.87	66,105		
	Vapor barrier	**35,350**	sf	0.75	26,513		
	Waterproofing system	**35,350**	sf	6.50	229,775		
	Compact existing sub-grade	**35,350**	sf	0.50	17,675		
	Mesh reinforcing 15% lap	**40,653**	sf	0.80	32,522		
	Concrete - 5" thick; 4,000 psi	**577**	cy	120.00	69,240		
	Placing concrete	**577**	cy	45.00	25,965		
	Finishing and curing concrete	**35,350**	sf	1.50	53,025		
	Control joints - saw cut	**35,350**	sf	0.10	3,535		
	Miscellaneous						
	New Elevator pit	**1**	ls	20,000.00	20,000		
	New loading dock	**1**	ls	30,000.00	30,000		
	Equipment pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$618,625	
	TOTAL - FOUNDATIONS						**$1,432,550**
A20	***BASEMENT CONSTRUCTION***						
A2010	**BASEMENT EXCAVATION**						
	No Work in this section						
	SUBTOTAL					-	
A2020	**BASEMENT WALLS**						
	No Work in this section						
	SUBTOTAL					-	
	TOTAL - BASEMENT CONSTRUCTION						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
56							
57	***B10 SUPERSTRUCTURE***						
58		12	lbs/sf		-		
59	**B1010 FLOOR CONSTRUCTION**	1,133	tns		-		
60	Floor Structure - Steel:						
61	Steel beams and columns; 12 lbs per SF	**911**	tns	3,300.00	3,006,300		
62	Shear studs	**30,377**	ea	2.50	75,943		
63	Floor Structure						
64	2" 18 Ga. Metal galvanized floor Deck	**151,884**	sf	3.75	569,565		
65	WWF reinforcement	**174,667**	sf	0.80	139,734		
66	Concrete Fill to metal deck; 5-1/2" thick; Light Weight	**2,705**	cy	160.00	432,800		
67	Place and finish concrete	**151,884**	sf	2.00	303,768		
68	Rebar to decks	**45,565**	lbs	1.50	68,348		
69	Misc. angles	**1**	ls	50,000.00	50,000		
70	Miscellaneous						
71	Premium for sloped balcony framing/guardrails etc.	**1**	ls	75,000.00	75,000		
72	Fire proofing to columns and beams	**151,884**	sf	1.80	273,391		
73	Fire stopping floors	**1**	ls	5,000.00	5,000		
74	SUBTOTAL					$4,999,849	
75							
76	**B1020 ROOF CONSTRUCTION**						
77	Roof Structure - Steel:						
78	Steel beams/Joists; allowance 8 lbs per SF	**222**	tns	3,300.00	732,600		
79	Roof Structure						
80	Acoustic deck at gym	**6,000**	sf	6.50	39,000		
81	1-1/2" 20 Ga. galvanized Metal Roof Deck	**49,400**	sf	3.50	172,900		
82	Miscellaneous						
83	Fire proofing to columns, beams and deck	**49,400**	sf	2.50	123,500		
84	SUBTOTAL					$1,068,000	
85							
86	***TOTAL - SUPERSTRUCTURE***						**$6,067,849**
87							
88							
89	***B20 EXTERIOR CLOSURE***						
90							
91	**B2010 EXTERIOR WALLS**	*60,743*	sf		-		
92	Interior skin						
93	6" metal stud backup	**60,743**	sf	7.00	425,201		
94	Insulation - 3" thick	**60,743**	sf	2.25	136,672		
95	Air barrier	**60,743**	sf	6.00	364,458		
96	Air barrier/flashing at windows	**8,591**	lf	6.00	51,546		
97	Gypsum Sheathing	**60,743**	sf	2.00	121,486		
98	Drywall lining to interior face of stud backup	**60,743**	sf	2.50	151,858		
99	Exterior skin						
100	New Exterior closure	**60,743**	sf	35.00	2,126,005		
101	Miscellaneous						
102	Aluminum sign at main entrance	**1**	ls	10,000.00	10,000		
103	Staging to exterior wall	**86,776**	sf	2.00	173,552		
104	SUBTOTAL					$3,560,778	
105							
106	**B2020 WINDOWS**	*26,033*	sf		-		
107	Windows/Curtainwall/Storefront; replace with new	**26,033**	sf	85.00	2,212,805		
108	Louvers (allowance)	**250**	sf	60.00	15,000		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
	Backer rod & double sealant	**8,591**	lf	4.00	34,364		
	Wood blocking at openings	**8,591**	lf	2.50	21,478		
	SUBTOTAL					$2,283,647	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**4**	pr	8,000.00	32,000		
	HM doors, frames and hardware- Double	**2**	pr	2,000.00	4,000		
	Backer rod & double sealant	**120**	lf	4.00	480		
	Wood blocking at openings	**120**	lf	3.00	360		
	SUBTOTAL					$36,840	
	TOTAL - EXTERIOR CLOSURE						**$5,881,265**
B30	***ROOFING***						
B3010	**ROOF COVERINGS**						
	Flat roofing						
	PVC roof membrane fully adhered	**55,400**	sf	7.00	387,800		
	Insulation; R-30	**55,400**	sf	5.50	304,700		
	1/2" dens-deck protection board	**55,400**	sf	1.50	83,100		
	Reinforced vapor barrier	**55,400**	sf	0.45	24,930		
	Rough blocking	**9,000**	lf	6.00	54,000		
	Miscellaneous Roofing						
	Roof fascia/cornice	**1,500**	lf	50.00	75,000		
	Roof ladder	**1**	ls	3,000.00	3,000		
	Walk pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					$937,530	
B3020	**ROOF OPENINGS**						
	Roof hatch	**1**	loc	2,500.00	2,500		
	SUBTOTAL					$2,500	
	TOTAL - ROOFING						**$940,030**
C10	***INTERIOR CONSTRUCTION***						
C1010	**PARTITIONS**						
	New Interior partitions	**187,234**	gsf	20.00	3,744,680		
	SUBTOTAL					$3,744,680	
C1020	**INTERIOR DOORS**						
	Interior doors, frames and hardware	**187,234**	gsf	4.00	748,936		
	SUBTOTAL					$748,936	
C1030	**SPECIALTIES / MILLWORK**						
	Toilet Partitions and accessories	**187,234**	gsf	0.80	149,787		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**187,234**	sf	0.70	131,064		
	Room Signs	**187,234**	gsf	0.40	74,894		
	Fire extinguisher cabinets	**62**	ea	350.00	21,700		
	Lockers	**187,234**	gsf	1.60	299,574		
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		
	Janitors Closet Accessories	**3**	rms	300.00	900		
	Media						
	Reception desk at Media	**1**	ls	25,000	25,000		

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
166	Library shelving at perimeters 7' Tall				F,F & E		
167	Library shelving at perimeters 3' Tall				F,F & E		
168	Display cases	**1**	ls	50,000.00	50,000		
169	Miscellaneous metals throughout building	**187,234**	sf	1.00	187,234		
170	Miscellaneous sealants throughout building	**187,234**	sf	0.50	93,617		
171	SUBTOTAL					$1,036,270	
172							
173	***TOTAL - INTERIOR CONSTRUCTION***						**$5,529,886**
174							
175							
176	***C20 STAIRCASES***						
177							
178	**C2010 STAIR CONSTRUCTION**						
179	Metal pan stair; egress stair	**15**	flt	22,000.00	330,000		
180	Concrete fill to stairs	**15**	flt	2,000.00	30,000		
181	SUBTOTAL					$360,000	
182							
183	**C2020 STAIR FINISHES**						
184	High performance coating to stairs including all railings etc.	**15**	flt	3,000.00	45,000		
185	Rubber tile at stairs - landings	**200**	sf	10.00	2,000		
186	Rubber tile at stairs - treads & risers	**1,800**	lft	19.06	34,308		
187	SUBTOTAL					$81,308	
188							
189	***TOTAL - STAIRCASES***						**$441,308**
190							
191							
192	***C30 INTERIOR FINISHES***						
193							
194	**C3010 WALL FINISHES**						
195	Wall finishes	**187,234**	sf	9.00	1,685,106		
196	SUBTOTAL					$1,685,106	
197							
198	**C3020 FLOOR FINISHES**						
199	Floor finishes	**187,234**	sf	8.00	1,497,872		
200	SUBTOTAL					$1,497,872	
201							
202	**C3030 CEILING FINISHES**						
203	Ceiling finishes	**187,234**	sf	6.00	1,123,404		
204	SUBTOTAL					$1,123,404	
205							
206	***TOTAL - INTERIOR FINISHES***						**$4,306,382**
207							
208							
209	***D10 CONVEYING SYSTEMS***						
210							
211	**D1010 ELEVATOR**						
212	New elevator; 4 stop	**1**	ea	160,000.00	160,000		
213	SUBTOTAL					$160,000	
214							
215	***TOTAL - CONVEYING SYSTEMS***						**$160,000**
216							
217							
218	***D20 PLUMBING***						
219							
220	**D20 PLUMBING, GENERALLY**						
221	Plumbing	**187,234**	gsf	11.00	2,059,574		
222	SUBTOTAL					$2,059,574	
223							
224	***TOTAL - PLUMBING***						**$2,059,574**
225							
226							
227	***D30 HVAC***						
228							

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
D30	**HVAC, GENERALLY**						
	New HVAC system	**187,234**	gsf	35.00	6,553,190		
	SUBTOTAL					$6,553,190	
	TOTAL - HVAC						**$6,553,190**
D40	***FIRE PROTECTION***						
D40	**FIRE PROTECTION, GENERALLY**						
	Allowance for fire pump	**1**	ls	60,000.00	60,000		
	Fire protection system	**187,234**	gsf	5.00	936,170		
	SUBTOTAL					$996,170	
	TOTAL - FIRE PROTECTION						**$996,170**
D50	***ELECTRICAL***						
D5010	**SERVICE & DISTRIBUTION**						
	Electrical system complete	**187,234**	gsf	28.00	5,242,552		
	New 30 KW PV system	**1**	ls	120,000.00	120,000		
	SUBTOTAL					$5,362,552	
	TOTAL - ELECTRICAL						**$5,362,552**
E10	***EQUIPMENT***						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**8**	ea	9,800.00	78,400		
	Gymnasium dividing net; electrically operated	**1**	loc	45,000.00	45,000		
	Volleyball net and standards	**1**	ea	2,000.00	2,000		
	Telescoping bleachers	**1**	ls	75,000.00	75,000		
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	150,000	150,000		
	Food Service equipment	**1**	ls	350,000	350,000		
	Electrically operated projection screens	**1**	loc	5,000.00	5,000		
	SUBTOTAL					$725,400	
	TOTAL - EQUIPMENT						**$725,400**
E20	***FURNISHINGS***						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	45.00	9,000		
	New seats at auditorium balcony	**140**	seat	260.00	36,400		
	Window blinds	**26,033**	sf	6.00	156,198		
	Science classroom casework	**3**	rm	65,000.00	195,000		
	Counters, base cabinets, tall storage in classrooms and other rooms	**187,234**	gsf	5.00	936,170		
	SUBTOTAL					$1,332,768	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					NIC	

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 187,234

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
OPTION 3.2	**NEW BUILDING**						
287	***TOTAL - FURNISHINGS***						**$1,332,768**
288							
289							
290	***F10 SPECIAL CONSTRUCTION***						
291							
292	**F10 SPECIAL CONSTRUCTION**						
293	No items in this section						
294	SUBTOTAL						
295							
296	***TOTAL - SPECIAL CONSTRUCTION***						
297							
298							
299	***F20 SELECTIVE BUILDING DEMOLITION***						
300							
301	**F2010 BUILDING ELEMENTS DEMOLITION**						
302	See main summary for demolition of existing buildings						
303	SUBTOTAL						
304							
305	**F2020 HAZARDOUS COMPONENTS ABATEMENT**						
306	See main summary for HazMat allowance				See Summary		
307	SUBTOTAL						
308							
309	***TOTAL - SELECTIVE BUILDING DEMOLITION***						

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 162,051

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION O RENOVATION						
A10	**FOUNDATIONS**					
	A1010	Standard Foundations	$324,102			
	A1020	Special Foundations	$0			
	A1030	Lowest Floor Construction	$77,384	**$401,486**	$2.48	1.3%
B10	**SUPERSTRUCTURE**					
	B1010	Upper Floor Construction	$2,518,638			
	B1020	Roof Construction	$113,500	**$2,632,138**	$16.24	8.7%
B20	**EXTERIOR CLOSURE**					
	B2010	Exterior Walls	$1,398,646			
	B2020	Windows/Curtainwall	$2,270,594			
	B2030	Exterior Doors	$46,819	**$3,716,059**	$22.93	12.3%
B30	**ROOFING**					
	B3010	Roof Coverings	$1,398,270			
	B3020	Roof Openings	$11,000	**$1,409,270**	$8.70	4.7%
C10	**INTERIOR CONSTRUCTION**					
	C1010	Partitions	$2,542,158			
	C1020	Interior Doors	$564,924			
	C1030	Specialties/Millwork	$850,736	**$3,957,818**	$24.42	13.1%
C20	**STAIRCASES**					
	C2010	Stair Construction	$126,000			
	C2020	Stair Finishes	$80,550	**$206,550**	$1.27	0.7%
C30	**INTERIOR FINISHES**					
	C3010	Wall Finishes	$1,312,719			
	C3020	Floor Finishes	$1,155,873			
	C3030	Ceiling Finishes	$909,846	**$3,378,438**	$20.85	11.2%
D10	**CONVEYING SYSTEMS**					
	D1010	Elevator	$190,000	**$190,000**	$1.17	0.6%
D20	**PLUMBING**					
	D20	Plumbing	$1,553,541	**$1,553,541**	$9.59	5.1%
D30	**HVAC**					
	D30	HVAC	$5,109,645	**$5,109,645**	$31.53	16.9%
D40	**FIRE PROTECTION**					
	D40	Fire Protection	$870,255	**$870,255**	$5.37	2.9%
D50	**ELECTRICAL**					
	D5010	Electrical Systems	$3,921,846	**$3,921,846**	$24.20	13.0%

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 162,051

CONSTRUCTION COST SUMMARY

	BUILDING SYSTEM		*SUB-TOTAL*	*TOTAL*	*$/SF*	*%*
OPTION O RENOVATION						
E10	**EQUIPMENT**					
	E10	Equipment	$730,400	**$730,400**	$4.51	2.4%
E20	**FURNISHINGS**					
	E2010	Fixed Furnishings	$979,243			
	E2020	Movable Furnishings	NIC	**$979,243**	$6.04	3.2%
F10	**SPECIAL CONSTRUCTION**					
	F10	Special Construction	$0	**$0**	$0.00	0.0%
F20	**SELECTIVE BUILDING DEMOLITION**					
	F2010	Building Elements Demolition	$1,209,320			
	F2020	Hazardous Components Abatement	$0	**$1,209,320**	$7.46	4.0%
TOTAL DIRECT COST (Trade Costs)				***$30,266,009***	*$186.77*	*100.0%*

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission **GFA** 162,051

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION O RENOVATION						
	GROSS FLOOR AREA CALCULATION						
	Basement - Parking			20,820			
	Ground			15,230			
	First Floor			44,304			
	Second Floor			45,724			
	Third Floor			35,973			
	TOTAL GROSS FLOOR AREA (GFA)				**162,051**	***sf***	
	A10 FOUNDATIONS						
A1010	**STANDARD FOUNDATIONS**						
	Allowance for new foundations for structural bracing and new interior walls etc.	**162,051**	sf	2.00	324,102		
	SUBTOTAL					**$324,102**	
A1020	**SPECIAL FOUNDATIONS**						
	No work in this section						
	SUBTOTAL						
A1030	**LOWEST FLOOR CONSTRUCTION**						
	Cut and Patching						
	Patch/level Existing slab on Grade at Lower level	**21,384**	sf	1.00	21,384		
	New Slabs for plumbing etc. at bathrooms and kitchen	**2,100**	sf	10.00	21,000		
	Miscellaneous Items						
	New elevator pit including cutting and patching	**1**	ls	25,000.00	25,000		
	Equipment pads	**1**	ls	10,000.00	10,000		
	SUBTOTAL					**$77,384**	
	TOTAL - FOUNDATIONS						**$401,486**
	B10 SUPERSTRUCTURE						
B1010	**FLOOR CONSTRUCTION**						
	CMU Seismic support/bracing	**162,051**	sf	12.50	2,025,638		
	New steel for bracing etc.; assumed 0.30 lbs per sf	**24**	tns	4,500.00	108,000		
	Allowance to patch structure at parking garage and new waterproofing system	**8,000**	sf	40.00	320,000		
	New openings in structure for elevator	**3**	loc	10,000.00	30,000		
	New penetrations to existing structure	**1**	ls	20,000.00	20,000		
	Fire stopping floors	**1**	ls	15,000.00	15,000		
	SUBTOTAL					**2,518,638**	
B1020	**ROOF CONSTRUCTION**						
	Roof Structure - Steel:						
	Steel allowance for new RTU's and snow loading reinforcement - assumed 1 lb per sf	**23**	tns	4,500.00	103,500		
	New openings in structure for elevator	**1**	loc	10,000.00	10,000		
	SUBTOTAL					**$113,500**	
	TOTAL - SUPERSTRUCTURE						**$2,632,138**

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission **GFA** 162,051

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION O RENOVATION						
	B20 EXTERIOR CLOSURE						
B2010	**EXTERIOR WALLS**						
	Exterior skin	*38,997*	*sf*		-		
	Allowance to repoint/repair existing exterior masonry	**38,997**	sf	22.00	857,934		
	GWB furred and Insulation - 3" thick to inside face of exterior wall	**38,997**	sf	9.25	360,722		
	Repairs at façade of historic building	**1**	ls	50,000.00	50,000		
	Miscellaneous						
	Staging to exterior wall	**64,995**	sf	2.00	129,990		
	SUBTOTAL					**$1,398,646**	
B2020	**WINDOWS/CURTAINWALL**	*25,998*	*sf*		-		
	Windows/Curtainwall/Storefront; replace with new	**25,998**	sf	85.00	2,209,830		
	Louvers	**1**	ls	5,000.00	5,000		
	Backer rod & double sealant	**8,579**	lf	4.00	34,316		
	Wood blocking at openings	**8,579**	lf	2.50	21,448		
	SUBTOTAL					**$2,270,594**	
B2030	**EXTERIOR DOORS**						
	Glazed entrance doors including frame and hardware; double door	**6**	pr	6,000.00	36,000		
	HM doors, HM frames and hardware- Single	**1**	ea	1,300.00	1,300		
	HM doors, frames and hardware- Double	**4**	pr	2,000.00	8,000		
	Backer rod & double sealant	**217**	lf	4.00	868		
	Wood blocking at openings	**217**	lf	3.00	651		
	SUBTOTAL					**$46,819**	
	TOTAL - EXTERIOR CLOSURE						**$3,716,059**
	B30 ROOFING						
B3010	**ROOF COVERINGS**						
	Flat roofing						
	Remove existing roof membrane	**26,024**	sf	2.00	52,048		
	PVC roof membrane fully adhered	**26,024**	sf	6.50	169,156		
	Insulation; R-30	**26,024**	sf	5.25	136,626		
	1/2" dens-deck protection board	**26,024**	sf	1.50	39,036		
	Reinforced vapor barrier	**26,024**	sf	0.45	11,711		
	Sloped roofing						
	Remove existing roof membrane	**23,640**	sf	2.00	47,280		
	New slat roof	**23,640**	sf	26.00	614,640		
	Insulation; R-30	**23,640**	sf	5.25	124,110		
	1/2" dens-deck protection board	**23,640**	sf	1.50	35,460		
	Reinforced vapor barrier	**23,640**	sf	0.45	10,638		
	Miscellaneous Roofing						
	Roof edge detail - fascia; repairs	**1,455**	lf	25.00	36,375		
	Repairs to cupola	**1**	ls	80,000.00	80,000		
	New snow fence	**1**	ls	10,000.00	10,000		
	Roof edge blocking	**1,455**	lf	18.00	26,190		
	Walk pads	**1**	ls	5,000.00	5,000		
	SUBTOTAL					**$1,398,270**	

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Edward Devotion School 17-Mar-14
Feasibility Design Options
Brookline, MA

Feasibility Submission **GFA** 162,051

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION O RENOVATION						
	B3020 ROOF OPENINGS						
	Roof hatch	**2**	ea	2,500.00	5,000		
	Roof ladders	**5**	ea	1,200.00	6,000		
	SUBTOTAL					**$11,000**	
	TOTAL - ROOFING						**$1,409,270**
	C10 INTERIOR CONSTRUCTION						
	C1010 PARTITIONS						
	New Interior partitions/rebuild existing	**141,231**	gsf	18.00	2,542,158		
	SUBTOTAL					**2,542,158**	
	C1020 INTERIOR DOORS						
	Interior doors, frames and hardware	**141,231**	gsf	4.00	564,924		
	SUBTOTAL					**$564,924**	
	C1030 SPECIALTIES / MILLWORK						
	Toilet Partitions and accessories	**141,231**	gsf	0.80	112,985		
	Backer panels in electrical closets	**1**	ls	1,000.00	1,000		
	Marker boards/tackboards in classrooms, offices, conference rooms, library and MP rooms	**141,231**	sf	0.70	98,862		
	Shelving in storage rooms	**1**	ls	10,000.00	10,000		
	Building directory	**1**	loc	3,000.00	3,000		
	Bronze dedication plaque	**1**	loc	2,500.00	2,500		
	Staff mailboxes/casework	**1**	ls	5,000.00	5,000		
	Room Signs	**141,231**	gsf	0.40	56,492		
	Fire extinguisher cabinets	**47**	ea	350.00	16,450		
	Lockers	**141,231**	gsf	1.60	225,970		
	Janitors Work Shop Accessories	**1**	ls	1,500.00	1,500		
	Janitors Closet Accessories	**3**	rms	300.00	900		
	Administration room						
	Reception desk	**1**	ls	21,000	21,000		
	Guidance						
	Reception Desk	**1**	ls	12,000	12,000		
	Media						
	Reception desk at Media	**1**	ls	25,000	25,000		
	Library shelving at perimeters 7' Tall				F,F & E		
	Library shelving at perimeters 3' Tall				F,F & E		
	Display cases	**1**	ls	15,000	15,000		
	Miscellaneous metals throughout building	**162,051**	sf	1.00	162,051		
	Miscellaneous sealants throughout building	**162,051**	sf	0.50	81,026		
	SUBTOTAL					**$850,736**	
	TOTAL - INTERIOR CONSTRUCTION						**$3,957,818**
	C20 STAIRCASES						
	C2010 STAIR CONSTRUCTION						
	Modify existing stairs to meet ADA; replace handrails	**18**	flt	7,000.00	126,000		
	SUBTOTAL					**$126,000**	

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Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission **GFA** 162,051

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION O RENOVATION						
158							
159	**C2020 STAIR FINISHES**						
160	Rubber treads/risers to egress stair	**2,160**	lfr	20.00	43,200		
161	Rubber to landings	**2,700**	sf	5.50	14,850		
162	Paint to staircases	**18**	flt	1,250.00	22,500		
163	SUBTOTAL					**$80,550**	
164							
165	***TOTAL - STAIRCASES***						**$206,550**
166							
167							
168	***C30 INTERIOR FINISHES***						
169							
170	**C3010 WALL FINISHES**						
171	Painting in garage	**20,820**	sf	2.00	41,640		
172	Wall finishes	**141,231**	sf	9.00	1,271,079		
173	SUBTOTAL					**$1,312,719**	
174							
175	**C3020 FLOOR FINISHES**						
176	Floor finishes at garage; sealer	**20,820**	sf	1.25	26,025		
177	Floor finishes	**141,231**	sf	8.00	1,129,848		
178	SUBTOTAL					**1,155,873**	
179							
180	**C3030 CEILING FINISHES**						
181	Ceiling finishes at garage; ACT	**20,820**	sf	3.00	62,460		
182	Ceiling finishes	**141,231**	sf	6.00	847,386		
183	SUBTOTAL					**$909,846**	
184							
185	***TOTAL - INTERIOR FINISHES***						**$3,378,438**
186							
187							
188	***D10 CONVEYING SYSTEMS***						
189							
190	New elevator; four stops	**1**	loc	160,000.00	160,000		
191	Upgrade existing elevator cab	**1**	ls	30,000.00	30,000		
192	SUBTOTAL					**190,000**	
193							
194	***TOTAL - CONVEYING SYSTEMS***						**$190,000**
195							
196							
197	***D20 PLUMBING***						
198							
199	**D20 PLUMBING, GENERALLY**						
200	Plumbing; replace fixtures and piping	**141,231**	gsf	11.00	1,553,541		
201	SUBTOTAL					**1,553,541**	
202							
203	***TOTAL - PLUMBING***						**$1,553,541**
204							
205							
206	***D30 HVAC***						
207							
208	**D30 HVAC, GENERALLY**						
209	New HVAC system in parking garage	**20,820**	gsf	8.00	166,560		
210	New HVAC system; displacement	**141,231**	gsf	35.00	4,943,085		
211	SUBTOTAL					**5,109,645**	
212							

PM&C

Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission **GFA** 162,051

	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	OPTION O RENOVATION						
	TOTAL - HVAC						**$5,109,645**
	D40 FIRE PROTECTION						
D40	**FIRE PROTECTION, GENERALLY**						
	Allowance for fire pump	**1**	ls	60,000.00	60,000		
	Fire protection system	**162,051**	gsf	5.00	810,255		
	SUBTOTAL					**$870,255**	
	TOTAL - FIRE PROTECTION						**$870,255**
	D50 ELECTRICAL						
D5010	**SERVICE & DISTRIBUTION**						
	Electrical system complete to parking garage	**20,820**	gsf	12.00	249,840		
	Electrical system complete	**141,231**	gsf	26.00	3,672,006		
	SUBTOTAL					**$3,921,846**	
	TOTAL - ELECTRICAL						**$3,921,846**
	E10 EQUIPMENT						
E10	**EQUIPMENT, GENERALLY**						
	Gym wall pads	**1**	ls	20,000.00	20,000		
	Basketball backstops; swing up; electric operated	**8**	ea	9,800.00	78,400		
	Gymnasium dividing net; electrically operated	**1**	loc	45,000.00	45,000		
	Volleyball net and standards	**1**	ea	2,000.00	2,000		
	Telescoping bleachers	**1**	ls	75,000.00	75,000		
	Theatrical Equipment Stage curtains, rigging and controls	**1**	ls	150,000	150,000		
	Food Service equipment	**1**	ls	350,000	350,000		
	Electrically operated projection screens	**2**	loc	5,000.00	10,000		
	SUBTOTAL					**730,400**	
	TOTAL - EQUIPMENT						**$730,400**
	E20 FURNISHINGS						
E2010	**FIXED FURNISHINGS**						
	Entry mats & frames - recessed with carpet/rubber strips	**200**	sf	25.00	5,000		
	Electrically Operated Shades in Media Rm.	**1**	ls	8,000.00	8,000		
	Window blinds	**25,998**	sf	6.00	155,988		
	Counters, base cabinets, tall storage in classrooms and other rooms	**162,051**	gsf	5.00	810,255		
	SUBTOTAL					**$979,243**	
E2020	**MOVABLE FURNISHINGS**						
	All movable furnishings to be provided and installed by owner						
	SUBTOTAL					**NIC**	

PM&C

Edward Devotion School
Feasibility Design Options
Brookline, MA

17-Mar-14

Feasibility Submission

GFA 162,051

		DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
		OPTION O RENOVATION						
265								
266		***TOTAL - FURNISHINGS***						**$979,243**
267								
268								
269	***F10***	***SPECIAL CONSTRUCTION***						
270								
271	**F10**	**SPECIAL CONSTRUCTION**						
272		No items in this section						
273		SUBTOTAL						
274								
275		***TOTAL - SPECIAL CONSTRUCTION***						
276								
277								
278	***F20***	***SELECTIVE BUILDING DEMOLITION***						
279								
280	**F2010**	**BUILDING ELEMENTS DEMOLITION**						
281		Remove existing Windows/Curtainwall	**25,998**	sf	6.00	155,988		
282		Interior demolition	**162,051**	sf	6.50	1,053,332		
283		SUBTOTAL					**$1,209,320**	
284								
285	**F2020**	**HAZARDOUS COMPONENTS ABATEMENT**						
286		See summary						
287		SUBTOTAL						
288								
289		***TOTAL - SELECTIVE BUILDING DEMOLITION***						**$1,209,320**
290								

Appendix D

Geotechnical Review

Report 63

McPHAIL ASSOCIATES, LLC

PRELIMINARY
FOUNDATION ENGINEERING REPORT

EDWARD DEVOTION SCHOOL

BROOKLINE MASSACHUSETTS

for

HMFH Architects, Inc.

March 3, 2014

Project No. 5697

McPHAIL ASSOCIATES, LLC

March 3, 2014

HMFH Architects, Inc.
130 Bishop Allen Drive
Cambridge, MA 02139

Attention: Mr. Pip Lewis

Reference: Edward Devotion School; Brookline, Massachusetts
Preliminary Foundation Engineering Report

This report documents the results of our subsurface exploration program and preliminary foundation design study for the proposed addition or new structure to be located at the Edward Devotion School in Brookline, Massachusetts. Refer to the Project Location Plan (Figure 1) for the general site location.

This report was prepared in accordance with our proposal dated December 16, 2013, and the subsequent authorization of HMFH Architects, Inc. (HMFH). These services are subject to the limitations contained in Appendix A.

Existing Conditions

The subject project site consists of an approximate 6.9-acre parcel bounded by Harvard Street to the southwest, Stedman Street to the northwest, and residential properties to the northeast and southeast. Currently, the site is comprised of three areas: 1) the existing Edward Devotion School building located on the southwest end of the site, fronting onto Harvard Street, 2) a grassed playing field located in the central portion of the site, and 3) basketball and tennis courts located on the northeast end of the site.

The existing ground surface surrounding the existing Edward Devotion School building slopes downward gradually from about Elevation +65 adjacent to Harvard Street to about Elevation +50 adjacent to the grassed playing field. The existing ground surface across the grassed playing field slopes downward gradually from south to north, from about Elevation +51 to about Elevation +47 across an approximate horizontal distance of 260 feet. The existing ground surface across the basketball and tennis courts slopes downward gradually from east to west, from about Elevation +51 to about Elevation +46 across an approximate horizontal distance of 250 feet.

Proposed Development

Nine (9) preliminary, conceptual design plans are currently being considered for the site. Four (4) of the conceptual plans propose the demolition of the existing Edward Devotion School building, and the construction of a new 3- to 5-story structure within the northeast and/or central portions of the site, which are currently occupied by the basketball and tennis courts, and the grassed playing field. The remaining five (5) conceptual plans propose to demolish the 1954 and 1974 additions to the existing Edward Devotion School building, renovate the original 1910 building, and construct a 4- to 5-story addition abutting the north end of the 1910 building. Options 1 and 2 also propose an underground parking garage constructed as a separate structure from the proposed additions and/or new school buildings. The proposed additions and/or new structures are anticipated to be constructed with the lowest level slabs

GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERS
2269 Massachusetts Avenue
Cambridge, Massachusetts 02140
617 / 868-1420

McPHAIL ASSOCIATES, LLC

near the existing ground level in the grassed playing field at about Elevation +49.

Available Information

Information provided to McPhail Associates, LLC (McPhail) included the following:

- conceptual plans entitled "Concept Diagrams" dated February 14, 2014, and prepared by HMFH;
- a 20-scale survey plan entitled "Existing Conditions Plan" dated February 25, 2014, and prepared by LandTech Consultants, Inc. (LandTech); and
- a concept study entitled "Edward Devotion School: Concept Study" dated November 2012, and prepared by HMFH.

Elevations cited herein are in feet and are referenced to the Town of Brookline datum which is 5.78 feet above the National Geodetic Vertical Datum (NGVD).

Subsurface Exploration Program

A subsurface exploration program consisting of eight (8) borings was conducted at the site during the period of February 18 through 21, 2014. The borings were performed by Carr-Dee Corp. of Medford, Massachusetts under contract to McPhail. The boring logs prepared by Carr-Dee Corp. are contained in Appendix B. The approximate plan locations of the borings are as indicated on the enclosed Subsurface Exploration Plan, Figure 2.

The borings were observed by a representative of McPhail who performed field layout, prepared field logs, obtained and visually classified soil samples, monitored groundwater conditions in the open explorations and groundwater observations wells, made minor adjustments to the exploration locations and determined the required exploration depths based upon the actual subsurface conditions encountered.

The field locations of the borings were determined by taping from existing site features identified on the above-referenced survey plan provided by LandTech. The existing ground surface elevation at each boring location was determined by a level survey performed by McPhail utilizing vertical control indicated on the above-referenced survey plan provided by the LandTech.

The borings were performed using either a track-mounted or truck-mounted drill-rig and advanced utilizing 3.75-inch hollow-stem augers or NW casing and the wet rotary drilling method. Standard 1-3/8 inch I.D. split-spoon samples and standard penetration tests were generally obtained continuously through the fill and organic deposits, and at minimum 5-foot intervals of depth within the marine and glacial outwash deposits in general accordance with the standard procedures described in ASTM D1586.

To permit monitoring of the groundwater level at the site, a groundwater observation well was installed in the completed borehole B-3. The groundwater monitoring report for this groundwater observation well is

presented in Appendix C.

Laboratory Testing

At the completion of the subsurface exploration program, soil samples were returned to our laboratory for more detailed classification, analysis, and testing. The laboratory testing consisted of sieve analyses to determine the grain size distributions and confirm the visual classifications of the fill and glacial outwash deposits. Laboratory test procedures were in general accordance with applicable ASTM Standards. Results of the gradation testing appear on Figures 3 and 4 following the text of this report.

Subsurface Conditions

Detailed descriptions of the subsurface conditions encountered within the borings are documented on the boring logs contained in Appendix B. The generalized subsurface conditions across the site were inferred primarily from these explorations, but also from our experience in the area. The subsurface conditions encountered in the explorations are described below.

A fill deposit was encountered underlying the existing asphalt, concrete sidewalk, or grass surface across the site, extending to approximate depths of 3.5 to 10 feet below the existing ground surface. The fill deposit was observed to vary from a compact silt and sand with trace organics and gravel, a to dense to very dense sand and gravel with trace ash and cinders. The fill deposit within borings B-2 and B-7, from depths of 4 to 8 feet and 6 to 8 feet, respectively, was observed to consist predominantly of very loose to loose ash and cinders. Grain size distributions of typical samples of the fill are provided on Figure 3.

Underlying the fill deposit at borings B-2 and B-5, an organic deposit of 1 to 1.5 feet in thickness was encountered at depths of 8 and 4 feet, respectively, below the existing ground surface. Where encountered, the organic deposit was observed to generally consist of a stiff, dark brown organic silt to peaty sand.

A glacial outwash deposit was encountered underlying the fill and/or organic deposits at depths of 3.5 to 10 feet below the existing ground surface, corresponding to elevations ranging from about +54.9 to about +38.2. The glacial outwash deposit was observed to generally consist of a compact to very dense, gray to brown sand with trace gravel and silt, to a sand and gravel with trace silt. Occasional cobbles were also noted within the glacial outwash deposit during drilling. The upper 8 and 11 feet of the glacial outwash deposit at borings B-1 and B-3(OW), respectively, were observed to consist of a compact to dense sandy silt to silty sand with occasional gravel. The glacial outwash deposit was observed to extend to the bottom depths of the borings at about 14.6 to 24 feet below the existing ground surface. Grain size distributions of typical samples of the glacial outwash are provided on Figure 4.

The groundwater level in the observation well installed within the completed borehole B-3(OW) was observed at a depth of about 16.9 feet below the existing ground surface, corresponding to about Elevation +32.7. However, it is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations of existing drainage patterns. The groundwater monitoring report for the groundwater

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observation well is contained in Appendix C.

Preliminary Foundation Design Recommendations

Based on the anticipated scope of the proposed construction and the subsurface conditions encountered across the site, it is recommended that foundation support for the proposed additions and/or new structures consist of conventional spread footing foundations in conjunction with soil-supported slabs-on-grade. The foundations should bear directly on the natural, undisturbed glacial outwash deposit, or on structural fill placed directly over the surface of the natural, undisturbed glacial outwash deposit after removal of all existing surface treatments, topsoil, fill, and organics within the footprints of the proposed footings and to the lateral extent defined herein.

The footings should be proportioned utilizing a maximum allowable design bearing pressure of 3 tons per square-foot. All foundations should be designed in accordance with the 8th Edition of the Massachusetts State Building Code (Code). Recommended minimum footing widths for continuous and isolated spread footings are 24 and 36-inches, respectively. For foundations with a least lateral dimension smaller than 36 inches, the allowable bearing pressure should be reduced to 1/3 of the recommended allowable bearing pressure times the least footing dimension in feet.

All perimeter foundations and interior foundations located adjacent to unheated areas should be provided with a minimum 4-foot thickness of soil cover as frost protection. Interior footings below heated areas should be located such that the top of the foundation concrete is at least 6 inches below the underside of the lowest level slab.

Preparation of the subgrade for support of the spread footings should include the removal of all existing surface treatments, topsoil, fill, and organics within the footprints of the proposed footings down to the surface of the natural, undisturbed glacial outwash deposit. In areas where the existing fill and/or organics extend deeper than the proposed bottom of footing elevation, compacted structural fill should be placed from the surface of the natural glacial outwash deposit to the proposed bottom of footing elevation. The lateral limits of the excavation for footings supported on structural fill should extend beyond the outside edge of the perimeter footing a horizontal distance equal to the distance between the bottom of the proposed footing and the surface of the underlying natural glacial outwash deposit, plus two feet in every plan direction. Where the lateral limits of excavation recommended for structural fill cannot be achieved due to proximity to property lines and/or adjacent structures, lean concrete should be placed from the surface of the glacial outwash deposit to the proposed bottom of foundation elevation. The lateral limits of the excavation for foundations supported on lean concrete should extend beyond the outside edge of the foundation a horizontal distance of at least 6 inches in all plan dimensions. Lean concrete should have a minimum compressive strength of 1,000 pounds per square-inch.

The bottom of the footings should be located such that they are below a theoretical line drawn upward and outward at 2 to 1 (horizontal to vertical) from the bottom exterior edge of any existing foundations, structures, or utilities. Where new footings are located immediately adjacent to existing foundations, the bottom of the footings should bear at the same elevation as the existing foundations.

Structural fill may consist of suitable excavated on-site fill, glacial outwash, or an imported gravel fill containing less than 8 percent passing the No. 200 sieve. All structural fill placed within the footprint of the proposed additions and/or new structures for support of the footings and slabs-on-grade should be placed in lifts having a compacted thickness of 6 inches and be compacted to a minimum of 95 percent of its maximum modified Proctor dry density. Reuse of the on-site soils as structural fill is discussed in more detail in the "Foundation Construction Considerations" section of this report. Placement and compaction of all fill materials should be monitored on a full-time basis in accordance with the requirements of the Code.

The lowest level slabs of the proposed additions and/or new structures should be designed as slabs-on-grade. Preparation of the proposed addition and/or new structure building pads for support of the slabs-on-grade should include the removal of all surface treatments and topsoil, and proofrolling of the subgrade with at least four passes of a 10-ton vibratory drum roller. All soft or compressible areas detected by the proofrolling should be excavated and replaced with compacted gravel fill. Where very loose to loose ash and cinders, such as those encountered within the fill at boring B-2 from depths of 4 to 8 feet below the existing ground surface, underlie the footprint of the slab-on-grade, they should be removed and replaced with compacted structural fill. The limits of the ash and cinders encountered at boring B-2 may be further defined during the final subsurface exploration program.

The lowest level slabs which are located at or above finished site grades should be underlain by a polyethylene vapor barrier and a minimum 6-inch thickness of imported gravel fill. Should the lowest level slabs be located below finished site grades, they should be underlain by a polyethylene vapor barrier spread across the surface of a 9-inch thickness of compacted 3/4-inch crushed stone, which is underlain by filter fabric, such as Mirafi 140N or equivalent, spread across the excavated fill, marine, and/or glacial outwash subgrades.

Furthermore, should the lowest level slabs be located below finished site grades, the slabs should be provided with underslab drainage for protection against the intrusion of groundwater. The underslab drainage should consist of a series of 4-inch diameter perforated PVC pipes located within the 9-inch thick crushed stone drainage layer. In addition, any below-grade foundation walls should be provided with perimeter drainage in order to protect against the intrusion of groundwater. The perimeter drainage should consist of 4-inch diameter perforated PVC pipes having the highest invert a minimum of 12 inches below the underside of the lowest level slab. It is further recommended that underslab and perimeter drainage pipes be surrounded by a minimum 6-inch thickness of 3/4-inch crushed stone and a layer of filter fabric such as Mirafi 140N, or equivalent. Any below-grade perimeter foundation walls should also be damproofed with a trowelled-on bitumastic damproofing.

The underslab and perimeter drains should be gravity drained to a storm drain line which is not subject to surcharge. Further, all localized depressions in the lowest level slabs extending below grade (such as pits, etc.) should be provided with properly tied continuous waterstops in all construction joints and metallic waterproofing to protect against groundwater intrusion.

Below-grade foundation walls receiving lateral support at the top and bottom (i.e. restrained walls) should be designed for a lateral earth pressure corresponding to an equivalent fluid density of 60 pounds per cubic-foot. Similarly, drained cantilevered retaining walls, (i.e. receiving no lateral support at the top) should be designed for a lateral earth pressure corresponding to an equivalent fluid density of 40 pounds

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per cubic-foot. To these values must be added the pressures attributable to earthquake forces per Section 1610.2 of the Code.

Lateral forces can be considered to be transmitted from the structures to the soil by passive pressure against the foundation walls utilizing an equivalent fluid density of 120 pounds per cubic-foot providing that the walls are designed to resist these pressures. Lateral force can also be considered to be transmitted from the structures to the soil by friction on the base of footings using a coefficient of 0.4, to which a safety factor of 1.5 should be applied.

Seismic Design Considerations

For the purposes of determining parameters for structural seismic design, the site is considered to be classified as a Site Class D as defined in Section 1613.5.2 of the Code. Further, the bearing stratum on the proposed site is not considered to be subject to liquefaction during an earthquake based on the criterion of Section 1806.4 of the Code.

Foundation Construction Considerations

The primary construction considerations include the removal of existing site structures and utilities, preparation of foundation bearing surfaces, subgrade protection, reuse of on-site soils, construction dewatering, and off-site disposal of excess excavated soil.

Prior to construction of the proposed additions and/or new structures, it is recommended that all existing structures and utilities within the footprints of the proposed construction be removed in their entirety. Where the depth of demolished structures and/or utilities extends deeper than the proposed construction, grades should be raised with structural fill following the removal of any existing fill. Outside the footprints and lateral excavation limits of the proposed buildings, abandoned structures and utilities may be cut off and removed to a depth of at least 2 feet below finished grades or proposed utilities and backfilled with ordinary fill.

Footing excavations in the glacial outwash deposit and/or structural fill should be prepared utilizing a smooth-edged or "toothless" excavator bucket to avoid disturbance of the bearing surface, or should be hand-cleared of loose and disturbed material. Immediately following excavation to the final bearing surface, a minimum 3-inch thickness of compacted 3/4-inch crushed stone should be placed over the subgrade to protect the bearing surface from subsequent disturbance.

Excavated glacial outwash soils may be suitable for reuse as structural fill provided they are maintained in a relatively dry condition and can be properly compacted. Based on our experience in the area, cobbles and boulders are likely to be encountered in the glacial outwash deposit. Thus, prior to reusing these soils, it will be necessary to cull out all material in excess of 4 inches in its largest dimension. Excavated glacial outwash soils which consist predominantly of silt, such as those encountered within the upper portion of the glacial outwash deposit within borings B-1 and B-3(OW), and which may be encountered elsewhere across the site, are not suitable for reuse as structural fill.

As discussed previously, the fill and glacial outwash soils may contain a high silt content. Hence, it is emphasized that these excavated soils can become unsuitable for reuse as structural fill if they become too wet. It is recommended that stockpiles of excavated material intended for reuse be protected against increases in moisture content by securely covering the stockpiles prior to and during precipitation events. Therefore, the placement and compaction of the on-site soil should be completed during relatively dry and non-freezing conditions. If, due to any of the above conditions, the excavated fill and/or glacial outwash soils become unsuitable for reuse as structural fill, they may be utilized as ordinary fill in areas outside the building footprint and an imported granular fill consisting of a well-graded natural sand and gravel with a maximum of 8 percent by weight passing the No. 200 sieve be used. Protection of all materials from increases in moisture content is considered to be the responsibility of the Contractor.

Proper control of groundwater and surface water will be necessary to maintain a firm subgrade to support construction traffic. Based on the soil and groundwater conditions encountered in the borings, it is anticipated that groundwater and surface water can be controlled using conventional sumping. It is recommended that all pumped groundwater be recharged on-site. If pumped groundwater cannot be recharged on-site, it would be necessary to dispose of pumped groundwater into a nearby storm drain or combined sewer which would require the need for a temporary construction dewatering discharge permit.

Off-site disposal of excess excavated soil should be conducted in accordance with the current policies of the Massachusetts Department of Environmental Protection. Conformance with the existing environmental regulations and policies will necessitate undertaking chemical testing of representative samples of the excess soil for disposal purposes. McPhail Associates, LLC has submitted selected composite samples of the fill deposit from the above-referenced borings for laboratory chemical testing, and will prepare a Preliminary Chemical Testing Summary letter which summarizes these results.

Final Comments

The subsurface information obtained from the borings is considered sufficient for preliminary foundation design purposes. McPhail has been retained to perform the final phase of subsurface explorations, which will consist of ten (10) borings and five (5) test pits. The final phase of subsurface explorations should be performed once the final building location has been determined.

The final foundation engineering report would be prepared following completion of the final phase of subsurface explorations, and would provide final foundation design recommendations based on the specific project design. The final foundation engineering report would contain additional geotechnical design recommendations and foundation construction considerations. Furthermore, after the submission of the final foundation engineering report, it is recommended that McPhail be retained to provide final design phase geotechnical engineering services, including providing design assistance to the Architect and Structural Engineer during the final design phase of this project.

It is also recommended that McPhail be retained during the construction period to observe final preparation of the foundation bearing surfaces and to observe the placement and compaction of structural fill, if required, in accordance with the provisions of the Massachusetts State Building Code and the provisions of the Contract Documents. Our involvement during the construction phase of the work should minimize costly delays due to unanticipated field problems since our field engineer would be under the

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HMFH Architects, Inc.
March 3, 2014
Page 8

direct supervision of our project manager who was responsible for the subsurface exploration program and foundation design recommendations documented herein.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the recommendations presented herein, please do not hesitate to call us.

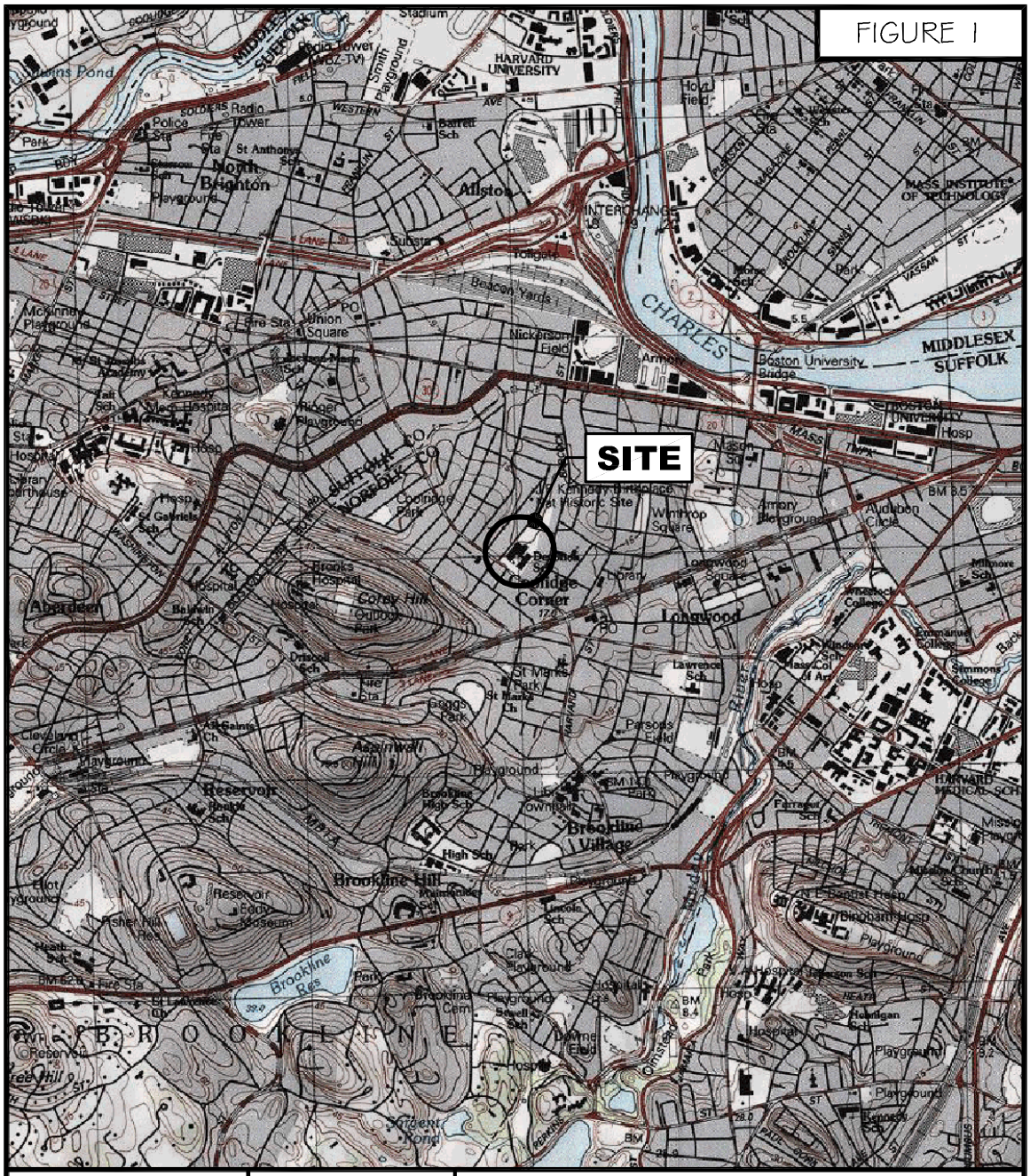
Very truly yours,

McPHAIL ASSOCIATES, LLC

Scott S. Dennis

Ambrose J. Donovan, L.S.P., P.E.

Enclosures
5697-PFER.wpd
SSD/ajd



McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)

N

SCALE 1:25,000

PROJECT LOCATION PLAN

EDWARD DEVOTION SCHOOL

BROOCKLINE MASSACHUSETTS

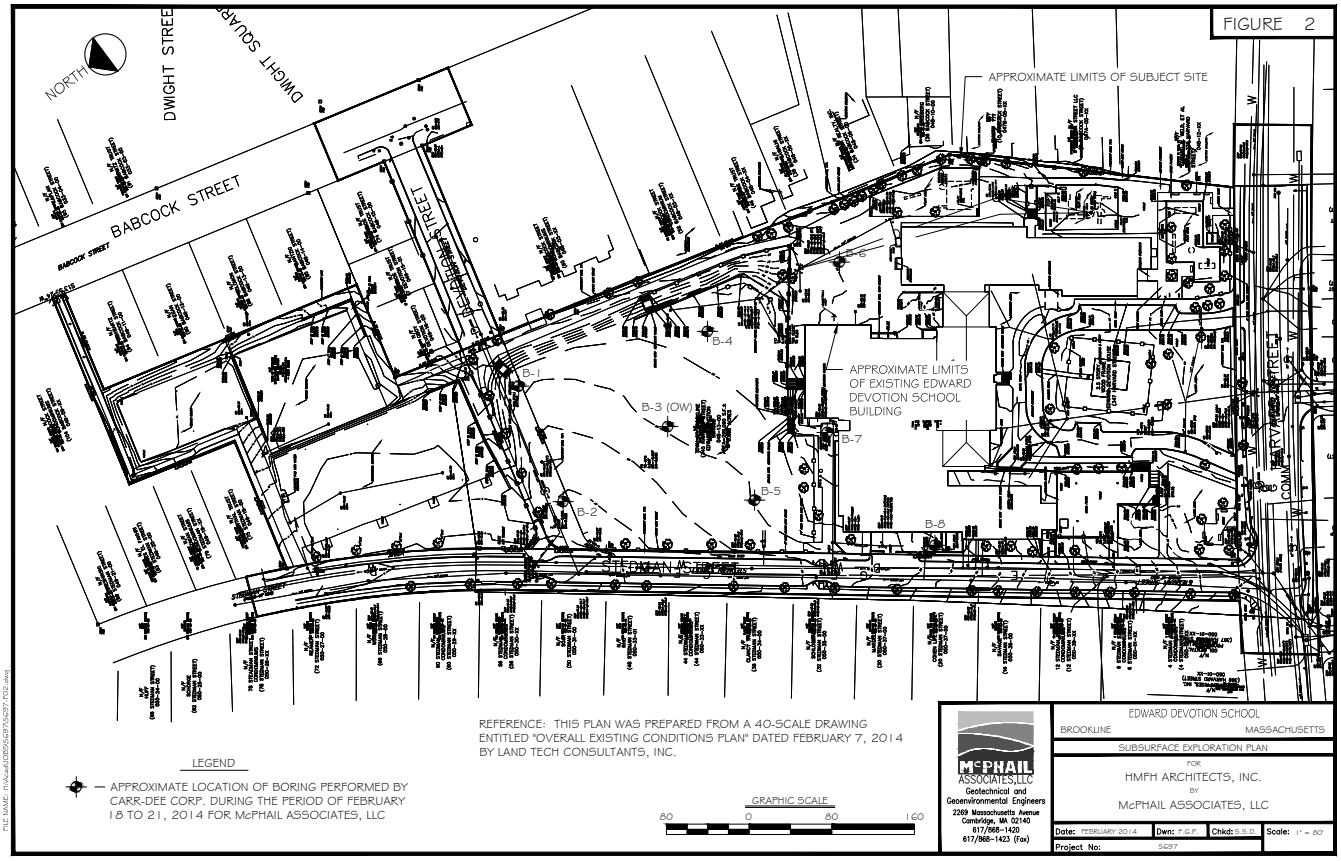
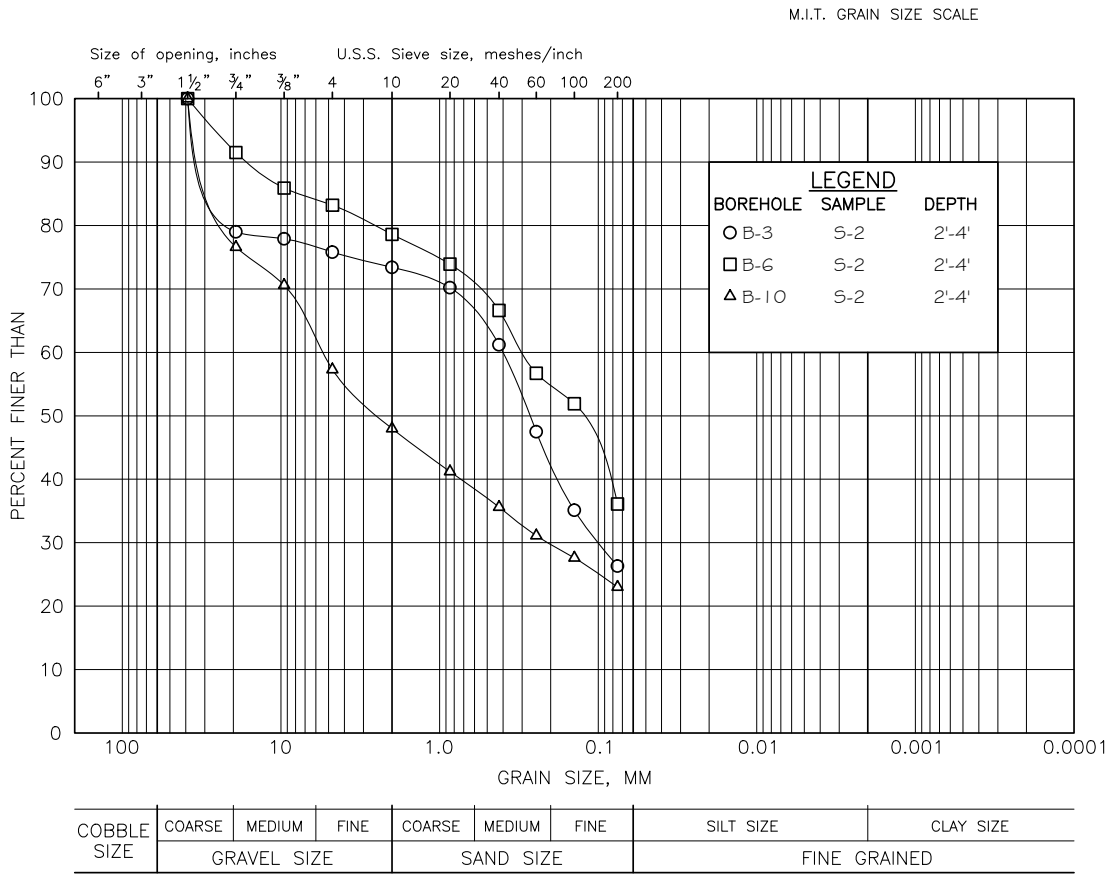


FIGURE 2
NORTH
DWIGHT STREET
DWIGHT SQUARE
BABCOCK STREET
BABCOCK STREET
STEDMAN STREET
APPROXIMATE LIMITS OF SUBJECT SITE
APPROXIMATE LIMITS OF EXISTING EDWARD DEVOTION SCHOOL BUILDING
B-1
B-2
B-3 (OW)
B-4
B-5
B-6
B-7
B-8
REFERENCE: THIS PLAN WAS PREPARED FROM A 40-SCALE DRAWING ENTITLED "OVERALL EXISTING CONDITIONS PLAN" DATED FEBRUARY 7, 2014 BY LAND TECH CONSULTANTS, INC.
LEGEND
— APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. DURING THE PERIOD OF FEBRUARY 18 TO 21, 2014 FOR McPHAIL ASSOCIATES, LLC
GRAPHIC SCALE
80 0 80 160
McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)
EDWARD DEVOTION SCHOOL
BROOKLINE MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN
FOR
HMFH ARCHITECTS, INC.
BY
McPHAIL ASSOCIATES, LLC
Date: FEBRUARY 2014
Dwn: P.G.P.
Chkd: S.S.D.
Scale: 1" = 80'
Project No: 5697

FILE NAME: H:\Acad\JOBS\5697\5697-F03_Sieve.dwg

PROJECT No. 5697



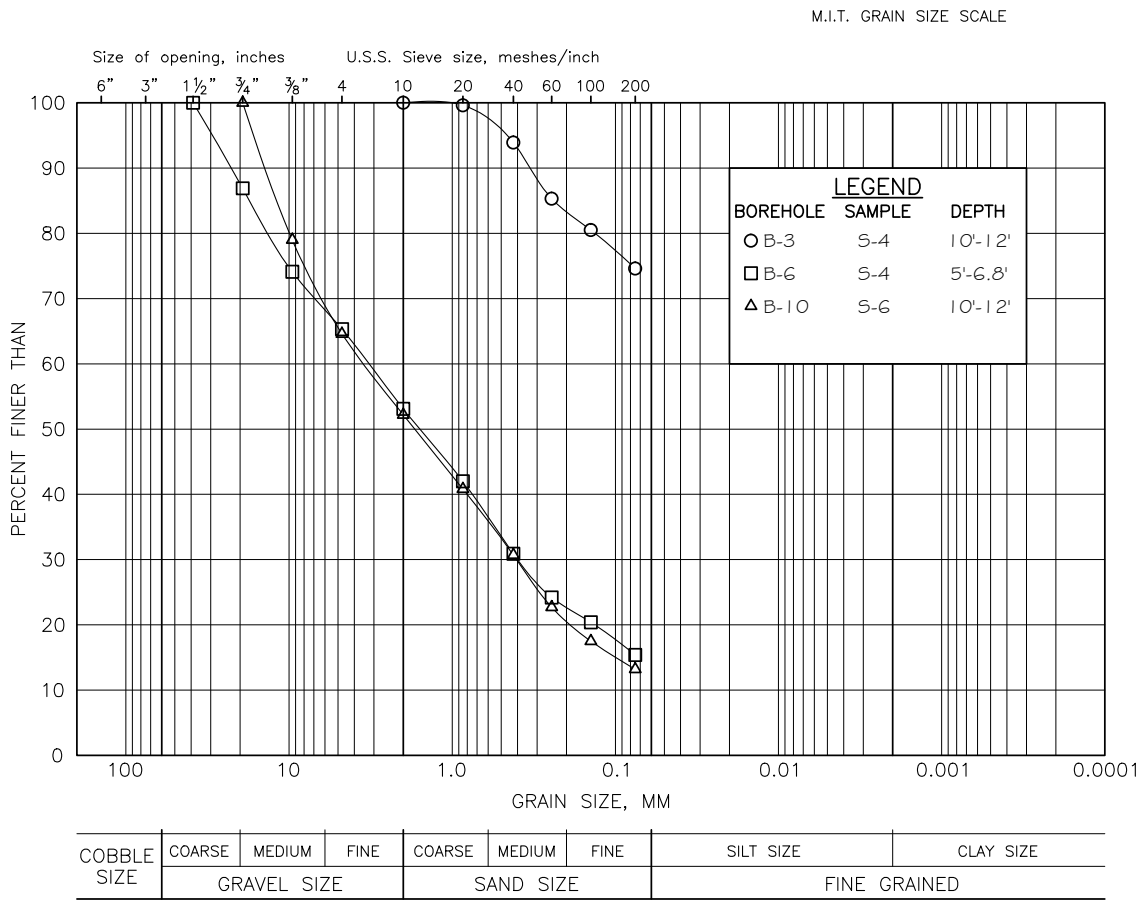
McPHAIL ASSOCIATES, LLC

GRAIN SIZE DISTRIBUTION
FILL

FIGURE 3

FILE NAME: H:\Acad\JOBS\5697\5697-F04_Sieve.dwg

PROJECT No. 5697



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GRAIN SIZE DISTRIBUTION
GLACIAL OUTWASH

FIGURE 4

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Appendix A

Limitations

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Limitations

This report has been prepared on behalf of and for the exclusive use of HMFH Architects, Inc. for specific application to the proposed construction to be located at the Edward Devotion School in Brookline, Massachusetts in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature or design of the proposed construction are planned, the conclusions and recommendations contained in this preliminary report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations presented in this preliminary report are based upon the data obtained from the borings performed at the approximate locations indicated on the enclosed plan. If variations in the nature and extent of subsurface conditions between the widely spaced explorations become evident during the course of construction, it will be necessary for a reevaluation of the recommendations of this preliminary report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.

It is recommended McPhail Associates, LLC be retained to provide design assistance to the Architect and Structural Engineer during the final design phase of this project. The purpose of this involvement is to review the structural foundation drawings and foundation notes for conformance with the recommendations herein, and to review or prepare the earthwork and specialty foundation specifications sections for inclusion into the Contract Documents for construction.

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Appendix B

Boring Logs prepared by Carr-Dee Corp.
B-1 through B-8

CARR-DEE CORP.

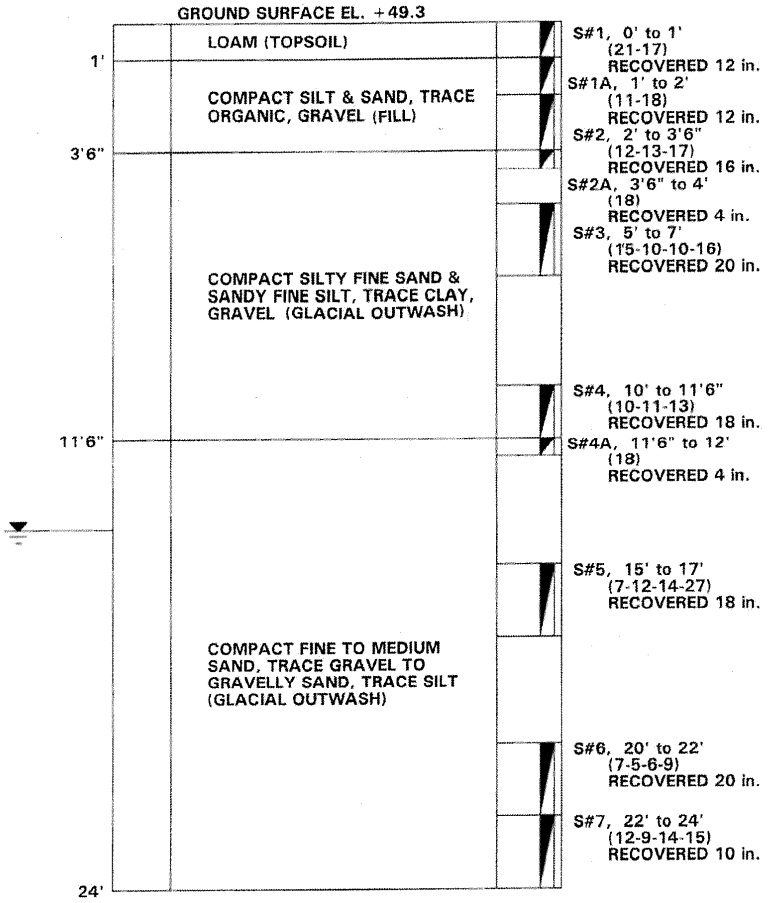
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 4 ft.

BORING 1

GROUND SURFACE EL. +49.3



WATER LEVEL 14'

SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 20'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-18-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 2

GROUND SURFACE EL. +47.2

Depth	Description	Sample
6"	LOAM (TOPSOIL)	S#1, 0' to 6' (29) RECOVERED 6 in.
	COMPACT SILT & SAND, SOME GRAVEL (FILL)	S#1A, 6" to 2' (18-21-12) RECOVERED 14 in.
		S#2, 2' to 4' (18-16-6-5) RECOVERED 11 in.
4'	VERY LOOSE ASH & CINDERS (FILL)	S#3, 4' to 6' (1-1-1-1) RECOVERED 12 in.
		S#4, 6' to 8' (1-2-1-1) RECOVERED 7 in.
8'	STIFF ORGANIC SILT & PEATY SAND (ORGANIC DEPOSIT)	S#5, 8' to 9' (4-6) RECOVERED 10 in.
9'	COMPACT FINE TO MEDIUM SAND, TRACE SILT TO SANDY SILT (GLACIAL OUTWASH)	S#5A, 9' to 10' (8-9) RECOVERED 10 in.
		S#6, 10' to 12' (8-8-11-16) RECOVERED 16 in.
		S#7, 15' to 17' (5-6-9-2) RECOVERED 14 in.
22'		S#8, 20' to 22' (5-6-8-10) RECOVERED 20 in.

WATER LEVEL 14'

SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 20'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-20-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

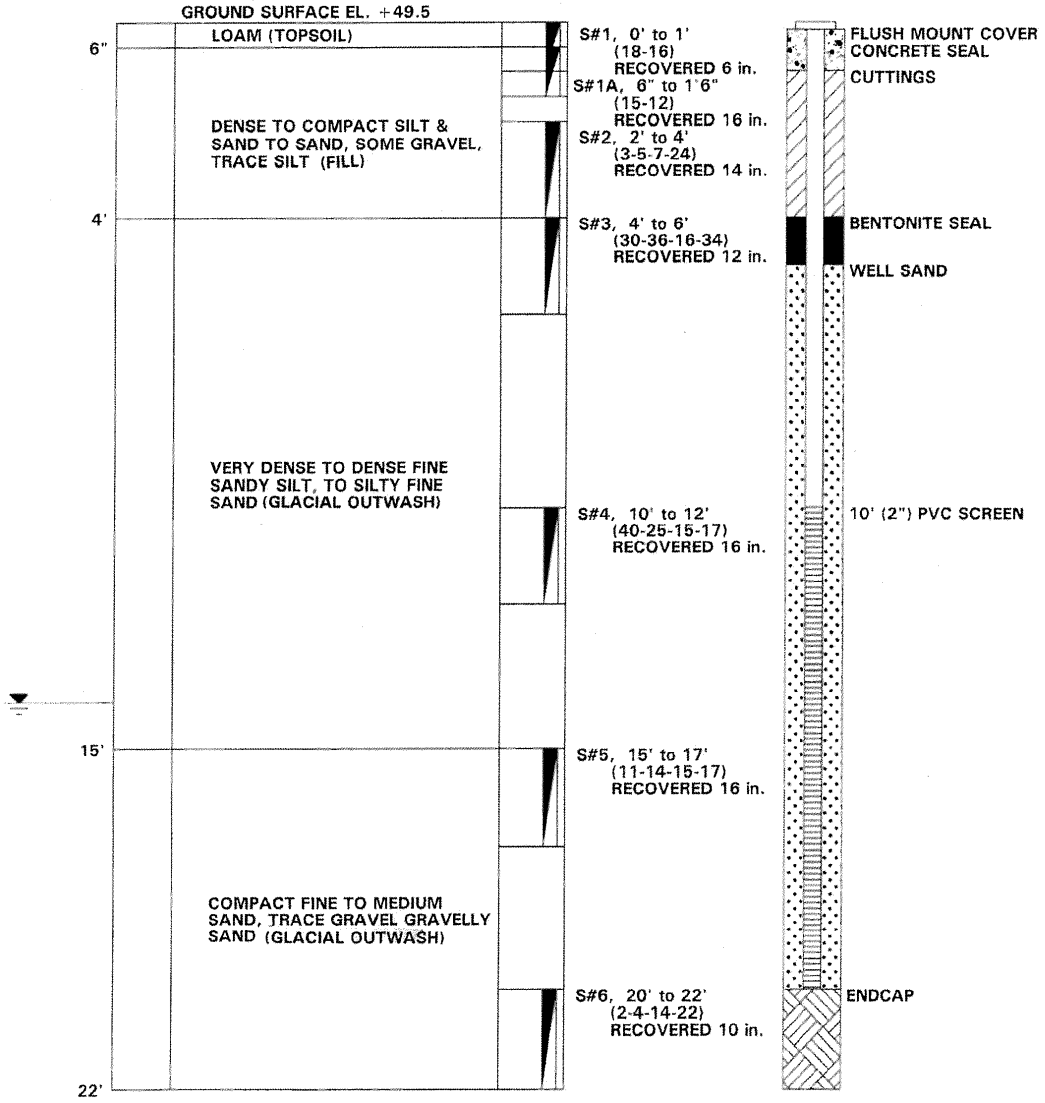
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 3-OW

GROUND SURFACE EL. +49.5



WATER LEVEL 14'

SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 20'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-18-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

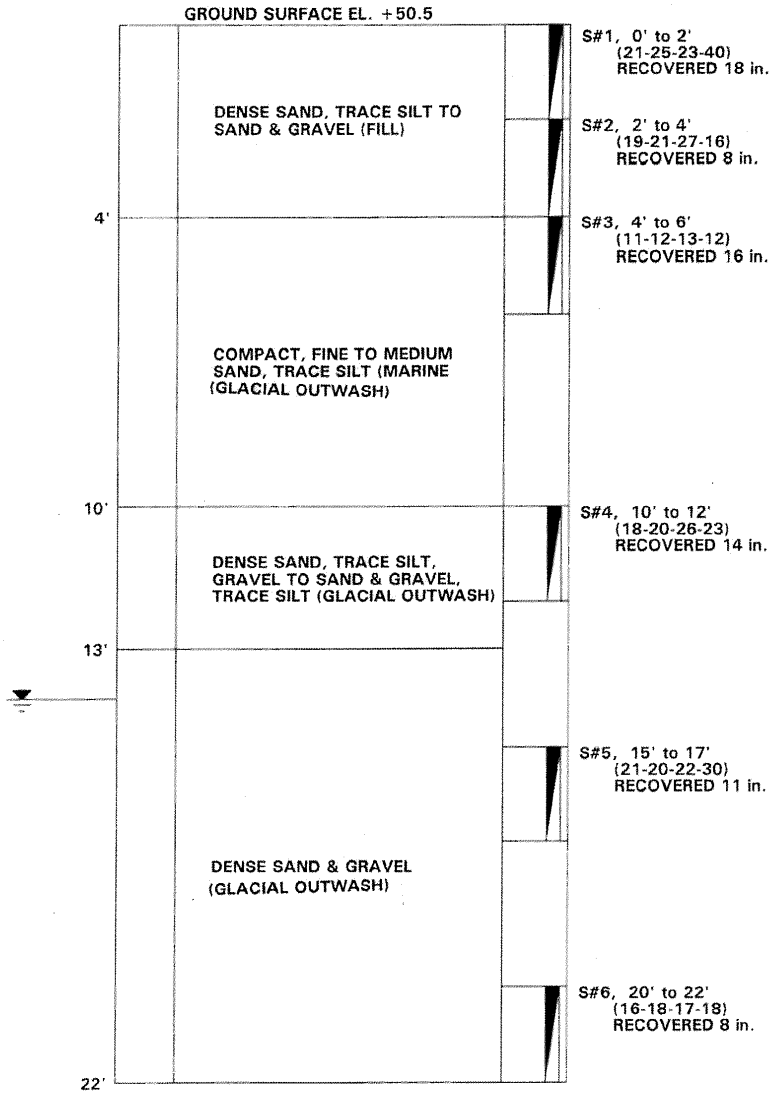
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 4

GROUND SURFACE EL. +50.5



WATER LEVEL 14'

SIZE OF CASING: NW, LENGTH: 20'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-19-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 5

GROUND SURFACE EL. +49.2

Depth	Description	Sample
6"	LOAM (TOPSOIL)	S#1, 0' to 6" (17) RECOVERED 6 in.
	SAND, GRAVEL, ASH, CINDERS (FILL)	#1A, 6" to 2' (18-22-22) RECOVERED 14 in.
		S#2, 2' to 4' (14-5-3-2) RECOVERED 12 in.
4'	STIFF ORGANIC SILT, SOME SAND (ORGANIC DEPOSIT)	S#3, 4' to 5'6" (7-8-7) RECOVERED 3 in.
5'6"	VERY DENSE TO COMPACT SAND & GRAVEL TO SAND, TRACE SILT, COBBLES NOTED @ 8'&13' (GLACIAL OUTWASH)	S#3A, 5'6" to 6' (12) RECOVERED 14 in.
		S#4, 6' to 8' (7-13-24-31) RECOVERED 16 in.
		S#5, 10' to 12' (67-32-32-34) RECOVERED 16 in.
		S#6, 15' to 17' (13-12-11-12) RECOVERED 16 in.
		S#7, 20' to 22' (26-24-32-41) RECOVERED 1 in.
22'		

WATER LEVEL 14'

SIZE OF CASING: NW, LENGTH: 15'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-19-20-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 6

GROUND SURFACE EL. +58.9

Depth	Description	Sample
6"	ASPHALT	
	COMPACT SILTY SAND, SOME GRAVEL (FILL)	S#1, 6" to 2' (3-5-9) RECOVERED 7 in.
		S#2, 2' to 4' (9-5-9-11) RECOVERED 9 in.
4'	VERY DENSE SAND & GRAVEL, COBBLES NOTED DURING DRILLING (GLACIAL OUTWASH)	S#3, 4' to 4'5" (100/5") RECOVERED 1 in.
		S#4, 5' to 6'10" (25-31-29-100/4") RECOVERED 8 in.
8'6"	COMPACT TO DENSE FINE SAND, TRACE SILT TO SILTY FINE SAND (GLACIAL OUTWASH)	S#5, 10' to 12' (9-9-8-11) RECOVERED 20 in.
		S#6, 15' to 16'6" (14-20-23) RECOVERED 18 in.
16'6"	VERY DENSE SAND & GRAVEL, TRACE SILT (GLACIAL OUTWASH)	S#6A, 16'6" to 17' (32) RECOVERED 6 in.
		S#7, 20' to 22' (42-36-52-28) RECOVERED 13 in.
22'		

NO WATER ENCOUNTERED
SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 20'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-21-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 7

GROUND SURFACE EL. +53.0

Depth	Description	Sample
4"	CONCRETE SIDEWALK	
	DENSE TO VERY DENSE SAND & GRAVEL, TRACE ASH & CINDERS (FILL)	S#1, 6" to 2' (6-17-26) RECOVERED 14 in.
		S#2, 2' to 4' (27-25-17-15) RECOVERED 9 in.
		S#3, 4' to 6' (38-26-28-24) RECOVERED 4 in.
6'	LOOSE ASH & CINDERS (FILL)	S#4, 6' to 8' (5-4-3-2) RECOVERED 12 in.
8'	STIFF SILT TO ORGANIC SILT, TRACE SAND, GRAVEL (FILL)	S#5, 8' to 10' (2-2-7-3) RECOVERED 10 in.
10'	VERY DENSE SAND, GRAVEL, COBBLES (GLACIAL OUTWASH)	S#6, 10' to 11'5" (23-35-100/5") RECOVERED 10 in.
14'7"		S#7, 14'6" to 14'7" (100/1") RECOVERED 0 in.

NO WATER ENCOUNTERED
SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 14'6"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-21-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

CARR-DEE CORP.

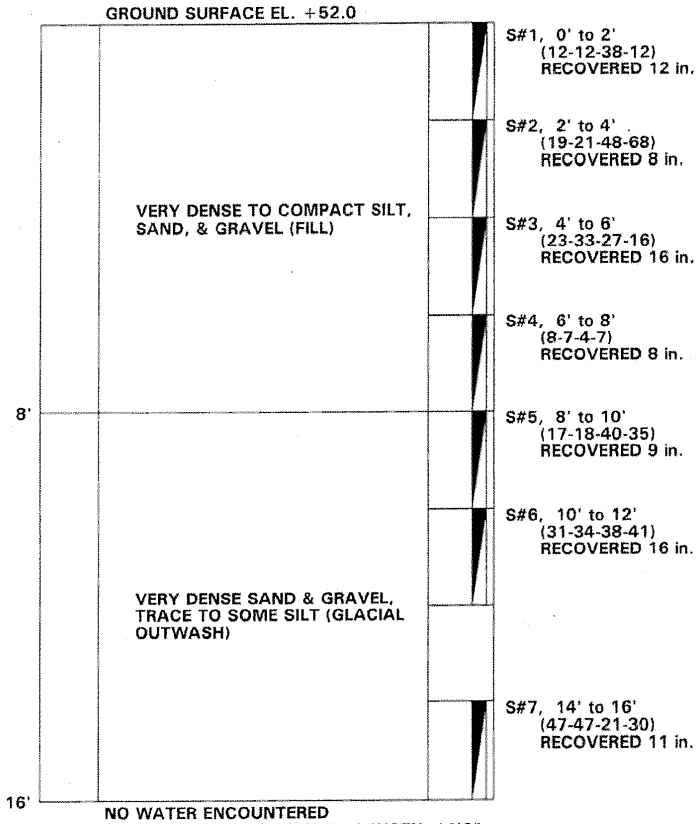
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOCIATES LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 2-24-2014 Job No.: 2014-21

Location: EDWARD DEVOTION SCHOOL, BROOKLINE, MA Scale: 1 in. = 3 ft.

BORING 8

GROUND SURFACE EL. +52.0



NO WATER ENCOUNTERED
SIZE OF AUGERS: 3-3/4" I.D., LENGTH: 14'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 2-20-21-2014

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches(±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

Sheet 1 of 1

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Appendix C

Groundwater Monitoring Report
B-3 (OW)

GROUNDWATER MONITORING REPORT

Well I.D.	B-3 (OW)	**Elevation Subtrahend (feet)**	+49.6	**Job. No.** **Job Name**	5697.2.00 Edward Devotion School	
Date	**Time**	**Elapsed Time (days)**	**Depth of Water from R-Box Top (feet)**	**Elevation of Water (feet)**	**Remarks**	**Read By**
2/18/2014	15:00	Initial	16.9	+32.7	Installed at 19.9 feet	TMC
2/19/2014	7:15	1	16.9	+32.7	Before developing	TMC
2/20/2014	7:15	2	16.9	+32.7		TMC
2/21/2014	7:15	3	16.9	+32.7		TMC

Appendix E

Environmental Report

Report 91

McPHAIL ASSOCIATES, LLC

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

EDWARD DEVOTION SCHOOL
345 HARVARD STREET

BROOKLINE MASSACHUSETTS

for

HMFH Architects, Inc.

March 4, 2014

Project No. 5697

McPHAIL ASSOCIATES, LLC

March 4, 2014

HMFH Architects, Inc.
130 Bishop Allen Drive
Cambridge, MA 02139

Attention: Mr. Pip Lewis

Reference: Edward Devotion School, 345 Harvard Street; Brookline, Massachusetts
Phase I Environmental Site Assessment Report

Ladies and Gentlemen:

This report documents the results of our Phase I Environmental Site Assessment for the Edward Devotion School located at 345 Harvard Street in Brookline, Massachusetts. Refer to the Project Location Plan, **Figure 1**, for the general site location.

This report has been prepared for and these services were performed in accordance with our proposal dated December 16, 2013 and the authorization of HMFH Architects, Inc. These services are subject to the limitations contained in **Appendix A**.

This environmental site assessment was conducted to assess the subject site with respect to the provisions contained in the following: (1) Massachusetts Oil and Hazardous Materials (OHM) Release Prevention and Response Act (MGL Chapter 21E); (2) ASTM E 1527-13 Standard Guide for Environmental Site Assessment: Phase I Environmental Site Assessment Process as refered to in 40 CFR Part 312 (the All Appropriate Inquiries Rule); and (3) Massachusetts Contingency Plan (MCP) 310 CMR 40.0000.

The objective of the Phase I Environmental Site Assessment, as defined in the ASTM E 1527-13 Standard, is to identify the potential presence of Recognized Environmental Conditions (RECs), Historical RECs (HREC) and/or Controlled RECs (CREC) at the subject site or at surrounding properties that may potentially pose a threat to the above referenced property.

Our scope of services consisted of the following, (i) a review of previous Phase I Reports, (ii) an assessment of the site history relative to the possible presence of oil and hazardous materials, (iii) a visual reconnaissance of the subject site and surrounding area, (iv) a search of information from the offices of the Town of Brookline for records of permits issued for the storage and/or use of oil or hazardous materials at the site, (v) a search of the Massachusetts Department of Environmental Protection (DEP) on-line database and files for records of incidents involving releases of oil and/or hazardous materials at and/or in the vicinity of the subject site, (vi) a database search of Federal records including the National Priorities List, the CERCLA List and the RCRIS Handlers List by EDR Inc., and (vii) assessing the above and documenting the results in a Phase I Environmental Site Assessment (ESA) Report.

Fronting onto Harvard Street to the southwest, the subject site consists of one (1) parcel of land containing the Edward Devotion School and is bounded by Babcock Street to the east, Stedman Street to the west, and residential properties to the north.

A visual reconnaissance of the subject site was conducted on February 25, 2014 by a representative of McPhail. Observations during our site reconnaissance included one end of a crawl space which runs beneath the eastern wing of the school. According to Mr. Hoogasian, the soil in the crawl space has tested positive for asbestos. The presence of asbestos in soil beneath the eastern wing of the school is considered to pose a conditional threat of impact to the subject site pending future renovations plans. If

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future site renovations include demolition and/or subgrade construction in the area of the crawlspace, the soil which contains asbestos is considered an REC with respect to the subject site.

A review of available historical records indicates that the subject site had been mainly occupied by the Edward Devotion School from the late 1800s to the today. Surrounding properties have been predominately depicted as residences during this time period.

A review of municipal records included a review of online files at the Town of Brookline Assessor's database and records provided by the Brookline Fire Department - Fire Prevention Division and the Brookline Building and Health Department and Clerks office. A data gap pertaining to the documentation of two 10,000-gallon USTs has been identified. Records indicated these tanks were installed in August 1974 and no additional documentation was observed. Additionally, there is a discrepancy between the tank capacities listed on the Fire Department permit and the listed tank capacities on provided site plans. This data gap is considered an REC with respect to the subject site. We recommend a Ground Penetrating Radar (GPR) survey to be completed in the vicinity of the known USTs to assess whether one or both of the 10,000-gallon USTs installed in 1974 are still present at the subject site.

The subject site is a DEP-listed site with the assigned RTN 3-14056. This DEP- listed site associated with the subject site has achieved a Permanent Solution in the form of a Class A-2 RAO and a level of No Significant Risk exists. This release sites is therefore not considered an REC with respect to the subject site, however it is considered an HREC since it is a former release that has occurred in connection with the subject property, and has been addressed to the satisfaction of the applicable regulatory authority. Therefore, this HREC is not considered to pose a threat of impact to the subject site.

Based on a review of the on-line DEP Release Site database, no RECs in connection with the subject site were identified.

A subsurface exploration program, consisting of the advancement of borings, was performed at the subject site in February 2014. Our study included laboratory testing of soil for disposal purposes. The soil samples were obtained as part of the above referenced subsurface exploration program and included a total of six (6) soil samples, including five (5) composite samples of the fill for chemical analyses for MCP total metals and polycyclic aromatic hydrocarbons (PAHs) and one (1) soil sample obtained from the boring B-7, which displayed high TVOC readings, was chemically tested for extractable petroleum hydrocarbons (EPH) with target analyses and volatile organic compounds (VOCs).

The results of the soil laboratory testing of identified that within the samples of the fill material, there were no concentrations that exceeded applicable MCP RCS-1 standards. However, the sample obtained from boring B-7 contained concentrations of EPH and VOCs above RCS-1 standards. Boring B-7 was performed in the vicinity of the school's USTs. The presence of EPH and VOC compounds in soil above applicable standards is considered an REC with respect to the subject site. We recommend additional soil and groundwater testing in the vicinity of B-7 and the current USTs to further assess this REC.

We have performed a *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at the Edward Devotion School located in Brookline, Massachusetts. This assessment has identified three (3) *recognized environmental conditions* in connection with the *subject site*.

In conclusion, we have performed an Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 for the Edward Devotion School located at 345 Harvard Street in

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Brookline, Massachusetts. Any exceptions to, or deletions from this practice are described in Section Data Gaps of this report.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the information presented herein, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

Julia A. Houlden

Ambrose J. Donovan L.S.P., P.E.

McPHAIL ASSOCIATES, LLC

TABLE OF CONTENTS

ITEM	PAGE
PURPOSE AND SCOPE	1
SITE AND LOCUS DESCRIPTION	3
VISUAL SITE RECONNAISSANCE	4
SITE HISTORY	6
EVALUATION OF DATA FAILURE	6
MUNICIPAL AND STATE RECORD REVIEW	7
ENVIRONMENTAL DATABASE REPORT	9
SITE REGULATORY STATUS	11
SITE RELEASE HISTORY	11
MASSACHUSETTS DEP RECORDS REVIEW	12
SUBSURFACE EXPLORATION	14
SUBSURFACE CONDITIONS	15
APPLICABLE MCP REPORTING CATEGORIES	16
RESULTS OF HEADSPACE SCREENING	16
SOIL ANALYTICAL TESTING	16
SUMMARY OF MCP NOTIFICATION REQUIREMENTS	17
DATA GAPS	17
SUMMARY AND CONCLUSIONS	18
ENVIRONMENTAL PROFESSIONAL STATEMENT	20

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FIGURES

Figure 1: Site Locus Map
Figure 2: Site Plan

TABLES

Table 1: PID Headspace Readings in Samples
Table 2: Analytical Results - Soil

APPENDICES

Appendix A: Limitations
Appendix B: Visual Site Reconnaissance Photographs & GIS Map
Appendix C: Historic Records
Appendix D: Municipal Records
Appendix E: EDR Radius Map Report
Appendix F: February 2014 Exploration Logs
Appendix G: Laboratory Analytical Data - Soil

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PURPOSE AND SCOPE

The purpose of this report by McPhail Associates, LLC is to present the results of a Phase I Environmental Site Assessment for the potential presence of Recognized Environmental Conditions at the Edward Devotion School located at 345 Harvard Street in Brookline, Massachusetts. Refer to the Project Location Plan (**Figure 1**) for the general site locus. The limits of the subject site, which define the limits of our assessment, are shown on the enclosed **Figure 2**.

These services were performed and this report was prepared in accordance with our proposal dated December 16, 2013 and the subsequent authorization of HMFH Architects, Inc., and are subject to the limitations in **Appendix A**.

The subject assessment was conducted for the above mentioned property in accordance with the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Assessments: Phase 1 Environmental Site Assessment Process (ASTM E 1527-13) as referenced in 40 CFR Part 312 (the All Appropriate Inquiries Rule). Standards utilized in our evaluation included the Massachusetts Oil and Hazardous Materials (OHM) Release Prevention and Response Act (MGL Chapter 21E) and the Massachusetts Contingency Plan (310 CMR 40.0000).

Our scope of services consisted of the following (i) a review of previous reports, (ii) an assessment of the site history relative to the possible presence of oil and hazardous materials, (iii) a visual reconnaissance of the subject site and surrounding area, (iv) a search of information from the offices of the Town of Brookline for records of permits issued for the storage and/or use of oil or hazardous materials at the site, (v) a search of the Massachusetts Department of Environmental Protection (DEP) on-line database and files for records of incidents involving releases of oil and/or hazardous materials at and/or in the vicinity of the subject site, (vi) a database search of Federal records including the National Priorities List, the CERCLA List and the RCRIS Handlers List by EDR Inc., and (vii) assessing the above and documenting the results in a Phase I Environmental Site Assessment (ESA) Report.

Excluded from our Phase I Environmental Site Assessment scope of work were a title search, an environmental lien search, an assessment for the presence of lead-based paint, mildew, mold, urea formaldehyde foam

insulation (UFFI), asbestos containing materials and other naturally occurring pollutants such as radon. No attempt was made to check on the compliance of present or past owners of the site with federal, state or local laws and regulations except as documented herein.

The objective of the Phase I Environmental Site Assessment, as defined in the ASTM E 1527-13 Standard, is to identify the potential presence of Recognized Environmental Conditions (RECs), Historical RECs (HREC) and/or Controlled RECs (CREC) at the subject site or at surrounding properties that may potentially pose a threat to the subject site.

The term REC is defined by ASTM E 1527-13 as "the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property; (1) due to a release to the environment, 2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment". The term HREC is defined by ASTM E 1527-13 as "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls". The term CREC is defined by ASTM E 1527-13 as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority..., with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls".

In summary, the results of our Phase I assessment identified three (3) RECs with respect to the subject site. The first REC has been identified due to the presence of asbestos in the soil in the crawl space beneath the eastern wing of the school. This is considered to pose a conditional threat of impact to the subject site pending future renovations plans. If future site renovations include demolition and/or subgrade construction in the area of the crawlspace, the soil which contains asbestos would be considered a REC with respect to the subject site. The second REC has been identified due to an exceedance of specific compounds identified during recent soil sampling at the subject site. Soil analytical testing identified extractable petroleum hydrocarbons and volatile organic carbons above applicable standards for the subject site. The third REC has been identified due to a data gap related to underground storage tank records.

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Our professional opinion is based solely on the scope of the work conducted and pertains to the subject site limits as shown on **Figure 2** and defined below.

SITE AND LOCUS DESCRIPTION

Fronting onto Harvard Street to the southwest, the subject site is bounded by Babcock Street to the east, Stedman Street to the west, and residential properties to the north. The subject site consists of one parcel of land that is occupied by a school, and athletic fields and courts with landscaped and paved areas.

The limits of the subject site are shown on **Figure 2**, which was prepared from a 40-scale plan of the subject site entitled "Overall Existing Conditions Plan" dated February 7, 2014 and prepared by Land Tech Consultants, Inc.

The subject site is located at longitude and latitude 42° 20' 41.64" north and 71° 7' 25.68" west, respectively, and at UTM coordinates 325,056.3 meters east and 4,690,041.5 meters north in Zone 19.

Site and Vicinity General Characteristics

The subject site is located in the Town of Brookline and consists of one parcel of land containing a school building as well as athletic fields and courts which are bounded by Harvard Street to the southwest, Stedman Street to the northwest and residential properties to the northeast and southeast.

Based on an on-line edition of the Massachusetts Geographic Information Systems DEP Priority Resources Map viewed on February 21, 2014, the subject site is not located within the boundaries of a Potentially Productive Aquifer or within a Zone II, Interim Wellhead Protection Area as defined by the Massachusetts Department of Environmental Protection (DEP). Further, there are no public or private drinking water supply wells, no Areas of Critical Environmental Concern, no fish habitats, no habitats of Species of Special Concern or Threatened or Endangered Species within specified distances of the subject site. There are no water bodies or wetland areas at the subject site. No areas designated as solid waste sites (landfills) are noted as being located within 1,000 feet of the site. Based on EDR's search of FEMA Flood Plain Maps, the subject site is not within a 100-year or 500-year flood plain. A copy of the GIS map is included in **Appendix B**.

Current Uses of the Property

As described above, the subject site is currently occupied by the Edward Devotion School, athletic fields and athletic courts. The remainder of the site contains landscaped and asphalt-paved areas.

Current Uses of Surrounding Properties

Properties surrounding the subject site are mainly utilized for residential properties and commercial properties. Properties surrounding the site to the east and west on Babcock Street and Stedman Street respectively, are mainly residential. Commercial retail storefronts predominantly occupy the properties to the south of the subject site, along Harvard Street.

VISUAL SITE OBSERVATIONS

A walk over and visual reconnaissance of the property was performed by representative of McPhail Associates, LLC on February 25, 2014, who was accompanied by Mr. Michael Kelly, a facilities worker for the Edward Devotion School and Mr. Russ Hoogasian, a representative with the Town of Brookline. Observations of readily visible portions of adjacent and nearby properties were also made at this time. However, in general, these observations were made from outside the boundaries of these properties. The extent of the subject site is shown on **Figure 2**. Photographs taken during our site visit on February 25, 2014 are included in **Appendix B**.

The subject site is currently occupied by a three-story school building with a subgrade level used mainly for parking. Additionally, the subject site contains athletic fields, athletic courts and landscaped and paved areas.

At the time of site reconnaissance, the majority of the athletic field and courts on the subject site were covered with a layer of snow. Limited observation of these areas is considered a data gap, however, it is not a significant gap based on the understood knowledge that these areas are used primarily as athletic fields and athletic courts.

The majority of the school building is occupied by classrooms and is used for educational purposes. Representative classrooms were observed and no evidence of the storage of oil or hazardous materials was observed. However, it is understood that there are limited quantities of chemicals used in classroom science experiments, which are reportedly stored in a

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locked cabinet. The school also contains a restaurant grade kitchen. Good housekeeping practices were observed in the kitchen. The sink area contained a grease trap which is reportedly cleaned throughout the year.

Additional areas were observed in the school, they included representative janitor and storage closets, utility areas and rooms, a boiler room, an elevator room, the generator room and its associated above ground storage tank. In general, no evidence of the presence of an REC was observed in these areas during our site reconnaissance.

Multiple, representative janitor and storage closets were observed. Generally good housekeeping was observed in these areas. Household cleaning supplies were observed as well as janitor's sinks. No evidence of RECs was noted in these areas.

The boiler room was observed to contain natural gas fired boilers to reportedly heat the school and hot water tanks. Additionally a sump was observed on in a separate room adjacent to the boiler room. Household cleaning supplies were also observed to be stored in this room. Good housekeeping was generally observed in the boiler room. Slight staining was observed in some areas, however it was observed to be located on concrete slab and is considered de minimus and is therefore not considered to pose a threat of impact to the subject site.

A generator room was observed on the subgrade basement parking level. According to Mr. Kelly, the generator is powered by a 275-gallon AST which was installed in October 2010. The AST was observed in the basement parking area was pad-mounted. Neither the generator or its associated AST displayed evidence of leaks or spills at the time of site reconnaissance.

An elevator room was also observed on the subgrade level. The elevator uses hydraulic oil and was observed to have an associated 5-gallon AST. No evidence of leaks or spills was observed at the time of site reconnaissance.

One end of a crawl space was observed, which runs beneath the eastern wing of the school. According to Mr. Hoogasian, the soil in the crawl space has tested positive for asbestos. The presence of asbestos in soil beneath the eastern wing of the school is considered to pose a conditional threat of impact to the subject site pending future renovations plans. If future site renovations include demolition and/or subgrade

construction in the area of the crawlspace, the soil which contains asbestos would be considered an REC with respect to the subject site.

SITE HISTORY

Our research into the history of the subject site included a review of a Sanborn Fire Insurance Maps dated 1898, 1925, 1950, 1957, 1965 and 1969, historic USGS Topographic Maps, historic Aerial Photographs, and a City Directory Search completed by EDR. Copies of the Sanborn Maps, USGS Topographic Maps, historic aerial photographs, and the City Directories are included in **Appendix C**.

Subject Site

According to the available Sanborn Maps and available historic information, the Edward Devotion School was founded in 1894 and is depicted on the 1989 Sanborn Map as a smaller building in the southeastern area of the subject site. Additionally, at this time the subject site also contained a dwelling and a stable in the southern area of the subject site and a building depicted as a Bell and Hose Tower on the northern portion of the subject site.

Sanborn Maps from 1925 through 1969 depicts the Edward Devotion School on the subject site with a similar footprint as the current school, with gradual additions made over time. The 1925 through 1965 Sanborns depict a Fire Department in the northeastern corner of the site where the Bell and Hose Tower was previously located.

Surrounding Properties

According to available Sanborn Maps the surrounding properties were predominantly depicted as dwellings. Stables were also depicted in the 1898 Sanborn Map and Apartment Buildings were depicted in the area on Maps from the 1960s.

EVALUATION OF DATA FAILURE

In accordance with ASTM E 1527-13, Article 8.3.2 and Article 8.3.2.1 the uses of the property shall be identified back to the property's first developed use, or back to 1940, whichever is earlier, and the maximum interval between historical sources is 5 years. During the time period between the initial development of the subject site to the present time, some intervals between historical sources exceeded 5 years; therefore, data failure was encountered. However, the indicated use of the subject

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site between sources was consistent and, therefore, the data failure is not considered to constitute a significant data gap.

MUNICIPAL AND STATE RECORD REVIEW

Our municipal record review focused on information related to the potential use, storage, generation, or disposal of oil and/or hazardous material (OHM) at the subject site and surrounding properties, and included on-line research and written inquiries of the Town of Brookline Assessors' information, Town of Brookline Clerk, Brookline Public Building Department, Brookline Environmental Health Department, and the Brookline Fire Department Fire Prevention Division. The Massachusetts DEP's UST Registry On-Line Database was also reviewed.

1. Town of Brookline Assessors' Office

According to the Town of Brookline Assessors on-line database, the subject site is identified as Parcel ID 048-13-00 which according to the Assessors' Office is owned by the Town of Brookline. A copy of the on-line Assessors' information is included in **Appendix D**.

2. Town of Brookline Clerk's Office

A request was made to the Town of Brookline Clerk's Office on February 25, 2014. There were no files on record for the subject site address at 345 Harvard Street at the Clerk's Office.

3. Brookline Public Building Department

A request was made to the Brookline Public Building Department on February 25, 2014. Reportedly, there were no files on record for the subject site, however, Russ Hoogasian, a representative of the Town of Brookline provided the "Report for Hazardous Materials Determination Survey at the Edward Devotion School" by Universal Environmental Consultants and dated August 2013. The scope of the report includes sampling for asbestos containing materials (ACM), lead based paint and other building materials which are excluded from our Phase I Assessment, detailed in the Limitations contained in Appendix A of this report.

4. Brookline Environmental Health Department

A request was made on February 25, 2014 to the Brookline Environmental Health Department for available records related to the Edward Devotion School located at 345 Harvard Street.

Available records included records of mold inspection and pest complaints in the building. Additionally, multiple asbestos removal documents and forms were viewed. Asbestos removal documentation pertained to various areas throughout the school building.

5. Brookline Fire Department - Fire Prevention Division

A written request for available records related to the historic storage or use of OHM was made to the Brookline Fire Department Fire Prevention Division (FPD) for the subject site on February 25, 2014.

Available records included notices of inspections and small fires. Additionally, permits for a 275-gallon above ground fuel oil tank from August 24, 2010 and permits for two 10,000-gallon underground storage tanks(USTs) from August 2, 1974 were viewed. The permits listed the two 10,000-gallon USTs as being located outside of the boiler room. No removal documentation or additional information was viewed regarding these tanks. The lack of information pertaining to these USTs and the discrepancy between the tank capacities listed on the Fire Department permit and the listed tank capacities on provided site plans, discussed herein, is considered a data gap and therefore an REC with respect to the subject site.

A Notice of Responsibility from the Department of Environmental Protection (DEP) was from October 16, 1992 was viewed. The Spill ID was listed as N92-1297 which is additionally listed in the EDR report in the Massachusetts Spills Database. According to this database this case was subsequently closed and is therefore not considered to pose a threat of impact to the subject site.

6. Massachusetts DEP's On-Line Database of Underground Storage Tanks (USTs)

Our review of the Massachusetts DEP's Underground Storage Tank (UST) Registry on-line Database on February 25, 2014 did not identify records of USTs at the subject site or in the immediate vicinity of the subject site.

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However, based on information and plans provided by the Town of Brookline, it is understood that one (1) UST containing 15,000 gallons of #4 Fuel Oil is currently located near the northwestern perimeter of the school. It is understood that this area previously contained two (2) USTs which contained 15,000 gallons of #4 Fuel Oil and 1,000 gallons of diesel oil.

ENVIRONMENTAL DATABASE REPORT

Research of Federal and State records was conducted by EDR Inc. of Milford, Connecticut, and is summarized in a database report dated February 10, 2014. The report includes a records search of federal and state database information indicating potential environmental matters within ASTM-established minimum search distances. A copy of the EDR database report is included in **Appendix E**.

The information provided by EDR indicates that the subject site is listed in several of the databases searched by EDR, including the State Hazardous Waste Site, Release, and Spills Databases. The subject site is an MCP listed site with a Release Tracking Number (RTN) 3-14056, discussed herein.

Based upon information provided by EDR, there are no U.S. Environmental Protection Agency (EPA) National Priority List (NPL) sites or Proposed NPL sites located within one-mile of the subject site according to the database update as of October 25, 2013. EDR reported no Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) sites located within 0.5-miles of the subject site based on the database update as of April 26, 2013.

EDR further reported no Corrective Action Report (CORRACTS) sites located within one mile of the subject site based on the database update as of September 9, 2013.

EDR reported one (1) RCRA Large Quantity Generator (LQG), two (2) RCRA Small Quantity Generators (SQG) and two (2) RCRA Conditionally Exempt Small Quantity Generator (CESQG) sites within 0.25-miles of the subject site based on the RCRA database updated September 10, 2013.

The closest Generator is a SQG listed as CVS Pharmacy which is located approximately 700 feet south-southeast of the subject site. This SQG site is listed with no violations. Based on the distance from subject site and the lack of violations found, this SQG site is not considered an REC with respect to the subject site

The remaining LQG, SQG and CESQG sites are all located at distances greater than 1,000 feet and are therefore not considered RECs with respect to the subject site.

Additionally, EDR reported five (5) RCRA Non-Generator (NonGen) sites located within 0.25-miles of the subject site. One (1) of the RCRA NonGen sites is located within 0.125-miles of the subject site. The NonGen site is listed as a Sunoco Service Station and is located approximately 300 feet southwest of the subject site. This site is listed with no violations found, therefore it is not considered an REC with respect to the subject site.

The remaining four (4) NonGen sites are located at distances greater than 1000 feet from the subject site and are therefore not considered to pose a threat of impact to the subject site.

EDR reported no state Solid Waste Facility/Landfill Sites within approximately 0.5-miles of the subject site based upon a state file update as of June 10, 2013.

EDR further reported no Manufactured Gas Plant (MGP) site located within one mile of the subject property.

EDR reported five (5) state listed Drycleaners within 0.25-miles of the subject site. The closest listed Drycleaners is located approximately 300 feet southeast of the subject site and is listed as Symphony Cleaners and is classified as actively using perc (tetrachloroethene). This site is considered downgradient of the subject site and is therefore not considered to pose a threat of impact to the subject site. The remaining state listed Drycleaners are located at distances greater than 0.125-miles from the subject site and are therefore not considered RECs.

EDR's list of "orphan sites," that is those sites with inadequate address information, did not indicate sites to be in close proximity to the subject site.

EDR reported that there are 204 State Hazardous Waste sites (SHWS) within one-mile of the subject site. In addition, EDR lists 30 State or Tribal leaking storage tanks as well as four (4) sites listed within the State and Tribal Institutional Control or Engineering Control Registries, all within 0.5-miles of the subject site. In general, most of the sites are not considered to pose a threat of impact based on their location and distance from the subject site, the type of release, and remedial activities

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undertaken. However, release sites located within close proximity of the subject site were assessed further for their potential to be RECs.

SITE REGULATORY STATUS

The current Massachusetts DEP database, searched on February 24, 2014 indicates that the subject site listed at 345 Harvard Street is a DEP-listed site with the assigned RTN of 3-14056. As discussed in the following section of this report, a level of No Significant Risk has been achieved for this release and a Condition of No Significant Risk exists in regard to the release associated with this site. Therefore, as defined by ASTM E 1527-13, this release site is considered an HREC with respect to the subject site.

SITE RELEASE HISTORY

The following is a summary of the DEP release documented on the subject site property and the associated response actions that were taken with respect to the release. As mentioned above, the release identified at the subject site under RTN 3-14056 achieved a Permanent Solution in the form of a Class A-2 Release Action Outcome (RAO), indicating that a level of No Significant Risk exists associated with RTN 3-14056. Therefore, given the current status of the release, this release is not considered an REC with respect to the subject site, however, it is considered an HREC with respect to the subject site. The following is a summary of the available information pertaining to the release associated with the subject site.

<u>345 Harvard Street; RTN 3-14056</u>

Based on a review of available information reviewed on February 20, 2014 from the Massachusetts DEP Waste Site/ Reportable Releases Online Database, it is understood that a release of approximately 30-gallons of #4 Fuel Oil occurred July 29, 1996. The release was reported to the DEP and assigned Release Tracking Number (RTN) 3-14056.

Contaminated soil was excavated from the release area. Confirmatory sampling collected from the excavation indicated that contamination was still present in the soil, therefore additional soil was excavated on August 15, 1996. Additional confirmatory samples were collected as well as a background soil sample from an area not impacted by the fuel oil release.

Approximately 80 tons of contaminated soil from the remedial excavations was disposed of offsite. Groundwater was not encountered during excavations.

Reportedly, confirmatory soil samples indicated low residual concentrations of PAHs and TPH remained in the soils at a depth of less than three (3) feet at the subject site. However, a risk assessment conducted by EMCON concluded that site conditions pose No Significant Risk and a Class A-2 RAO was submitted for the subject site. Since a Permanent Solution in the form of a Class A-2 RAO has been achieved for the subject site, the release associated with RTN 3-14056 is not considered an REC with respect to the subject site.

As discussed herein, the release associated with RTN 3-14056 has achieved a Permanent Solution and a level of No Significant Risk exists. Therefore, this release site is not considered an REC with respect to the subject site, however, it is considered an HREC. An HREC is a former release that has occurred in connection with the subject property, which has been addressed to the satisfaction of the applicable regulatory authority and/ or meets unrestricted use criteria as established by a regulatory authority. Therefore, this HREC is not considered to pose a threat of impact to the subject site.

MASSACHUSETTS DEP RECORDS REVIEW

As noted above, according to the EDR review of DEP databases, the majority of DEP listed disposal sites are either located at distances greater than 0.125-miles from the subject site, are down-gradient or cross-gradient with respect to the subject site, and/or have achieved a Response Action Outcome (RAO) compliance status in accordance with the Massachusetts Contingency Plan (MCP) which indicates that a Permanent Solution has been achieved, and a Condition of No Significant Risk exists, therefore these sites are not likely to pose a threat of impact to the subject site. However, four (4) release sites in close proximity to the subject site were further evaluated for their potential to affect the subject property.

1. <u>40 Babcock Street; RTN 3-29514</u>

This MCP site is located approximately 300 feet west of the subject site. Based on a "Utility Related Abatement Measure (URAM) Completion Report" prepared by Tighe and Bond, Inc., for National Grid dated January 2011, it is understood that soil samples were collected for extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) while investigating a natural gas leak along Babcock Street.

Reportedly, results from the analyses performed indicated concentrations of polycyclic aromatic hydrocarbons (PAHs) above the reportable concentration, RCS-1 in the soil. Tighe and Bond determined that the

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elevated concentrations of PAHs were likely attributable to urban fill and a URAM was proposed.

In September and October 2010, National Grid reportedly performed URAM activities. Soil was excavated as part of the URAM and removed by Clean Harbors Environmental Services. A total of 13 cubic yards of soil was excavated and disposed of offsite by Clean Harbors and the excavation was backfilled with clean material completing the URAM activities. Groundwater was not encountered.

Based on the location, distance from the subject site, nature of the release and completion of a URAM, the release area associated with RTN 3-29514 is not considered an REC with respect to the subject site.

2. 9 Babcock Street; RTN 3-15381

This MCP site is located approximately 350 feet to the southwest of the subject site. The site is listed with the DEP due to a release of approximately 50-gallons of diesel fuel to asphalt pavement from a saddle tank that triggered a 2-hour notification to the DEP on August 12, 1997. Absorbent materials were used to remediate the diesel fuel spill. A Class A-1 RAO was filed with the DEP in October 1997 indicating that a Permanent Solution had been achieved, the level of oil and hazardous material in the environment has been reduced to background, and a Condition of No Significant Risk was achieved. Based on our review of a report by Corporate Environmental Advisors, Inc., titled "Response Action Outcome Statement" dated October 7, 1997 and response actions conducted, this site is not considered to pose a threat of impact to the subject site. Therefore, this site is not considered to be an REC with respect to the subject site.

3. 5 Beals Street; RTN 3-29356

This release site is located approximately 350 feet west-southwest of the subject site. It is understood that a release of oil from two 330-gallon ASTs occurred at the release site. The release material migrated across the basement floor slab and into the subsurface soil through an opening in the floor. Reportedly, approximately 21 tons of soil was excavated from the impacted area and 14 confirmatory soil samples were collected from the excavation area. Groundwater was not encountered during excavation activities and confirmatory samples did not indicate the presence of petroleum hydrocarbons above detectable concentrations. According to the Immediate Response Action

Completion and Response Action Outcome Report by Common Sense Environmental, Inc., the release site associated with RTN 3-29356 has achieved a condition of No Significant Risk and a Permanent Solution in the form of an A-2 RAO is applicable. Based on the location and distanced from the subject site and that this release site has achieved a Permanent Solution, it is not considered an REC with respect to the subject site.

4. 57 Babcock Street; RTN 3-12759

This release site is located approximately 350 feet east-northeast of the subject site. It is understood that a release from a pad-mounted transformer occurred and was discovered on July 31, 1995. According to a report entitled, "Documentation Supporting Response Action Outcome Statement; Release from Pad-Mounted Transformer PM-87" by Environmental Science Services (ESS) and dated October 3, 1995, it is understood that upon examination it was determined that approximately 90-gallons of non-PCB containing transformer oil had released.

The transformer was removed and replaced on July 31, 1995 and absorbent materials were spread around the release area. All visibly stained soil was removed with a vactor truck from the area surrounding the pad. Initially, a total of two (2) cubic yards of soil was removed from the Site and four (4) samples were collected. Results of the analysis detected concentrations of TPH above the Method 1 Standard. On September 12, 1995, an additional one (1) cubic yard of soil was excavated and field screening indicated TPH was below the Method 1 Standard.

ESS determined that the release associated with RTN 3-12759 had been remediated to background conditions and that a Permanent Solution in the form of a Class A-1 RAO existed, therefore this release site is not considered an REC with respect to the subject site.

SUBSURFACE EXPLORATION

A subsurface exploration program consisting of borings was completed by McPhail at the site in February 2014. Eight (8) borings, were completed at the site February by Carr-Dee Corp. of Medford, Massachusetts under contract to McPhail. The approximate locations of the explorations are indicated on the enclosed **Figure 2**. Logs of the explorations, prepared by Carr Dee Corp., are contained in **Appendix F**.

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The explorations were monitored by a representative of McPhail Associates, LLC who performed field layout, prepared field logs, obtained and visually classified soil samples, performed headspace screening of soil samples for the presence of total volatile organic compounds (TVOC), monitored groundwater conditions in the open explorations and groundwater observation well, made minor adjustments to the exploration locations based on surface conditions, and determined the required exploration depths based upon the actual subsurface conditions encountered.

SUBSURFACE CONDITIONS

Subsurface explorations generally encountered a fill deposit underlying the existing asphalt, concrete sidewalk, or grass surface across the site, extending to approximate depths of 3.5 to 10 feet below the existing ground surface. The fill deposit was observed to vary from a compact silt and sand with trace organics and gravel, a to dense to very dense sand and gravel with trace ash and cinders. The fill deposit within borings B-2 and B-7, from depths of 4 to 8 feet and 6 to 8 feet, respectively, was observed to consist predominantly of very loose to loose ash and cinders. Grain size distributions of typical samples of the fill are provided on Figure 3.

Underlying the fill deposit at borings B-2 and B-5, an organic deposit of 1 to 1.5 feet in thickness was encountered at depths of 8 and 4 feet, respectively, below the existing ground surface. Where encountered, the organic deposit was observed to generally consist of a stiff, dark brown organic silt to peaty sand.

A glacial outwash deposit was encountered underlying the fill and/or organic deposits at depths of 3.5 to 10 feet below the existing ground surface, corresponding to elevations ranging from about +54.9 to about +38.2. The glacial outwash deposit was observed to generally consist of a compact to very dense, gray to brown sand with trace gravel and silt, to a sand and gravel with trace silt. Occasional cobbles were also noted within the glacial outwash deposit during drilling. The upper 8 and 11 feet of the glacial outwash deposit at borings B-1 and B-3(OW), respectively, were observed to consist of a compact to dense sandy silt to silty sand with occasional gravel. The glacial outwash deposit was observed to extend to the bottom depths of the borings at about 14.6 to 24 feet below the existing ground surface.

The groundwater level in the observation well installed within the completed borehole B-3(OW) was observed at a depth of about 16.9 feet

below the existing ground surface, corresponding to about Elevation +32.7. However, it is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations of existing drainage patterns. The groundwater monitoring report for the groundwater observation well is contained in Appendix C.

APPLICABLE MCP REPORTING CATEGORIES

The Massachusetts Contingency Plan (MCP) 310 CMR 40.0000 implemented on October 1, 1993 and most recently revised on December 14, 2007 established "... requirements and procedures for notifying the Department of releases and threats of release of oil and/or hazardous material." The MCP defines categories for soil and groundwater at sites under investigation. The MCP also establishes Reportable Concentrations for oil and hazardous materials in soil and groundwater for the defined categories. The soils at the subject site are classified as RCS-1 since the site is located within 500 feet of residential property. Groundwater at the site is classified as RCGW-2 since the site is not located in an MCP drinking water resource area.

RESULTS OF HEADSPACE SCREENING

Soil samples obtained from the explorations were screened for the presence of TVOCs. The TVOC screening results are summarized in **Table 1**.

The headspace screening was performed in accordance with DEP's "Jar Headspace Analytical Screening Procedure," Attachment II to the Interim Remediation Waste its Management Policy for Petroleum Contaminated Soils, #WSC-94-400. The screening was performed with an MiniRae-3000 Photoionization Detector equipped with a 10.6 eV lamp.

A total of 59 soil samples were screened for the presence of TVOC. The headspace screening indicated TVOC readings ranging from 0.0 parts per million (ppm) to 3.5 ppm with the exception of one soil sample obtained from boring, B-7, which indicated a TVOC reading of 117.9 ppm and was noted to have a hydrocarbon odor.

SOIL ANALYTICAL TESTING

Per our proposal, samples of soil obtained during our subsurface exploration program were submitted for laboratory analysis for common contaminants of concern associated with urban environments in order to characterize the soil for potential disposal during construction activities.

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The soil analytical results are included in **Appendix G** and are summarized in **Table 2**. The results of headspace screening, proximity to the groundwater table, and visual and olfactory observations were used to determine the selection of soil samples that were submitted to the laboratory for analytical testing.

The results of analytical testing were evaluated on the basis of a comparison with reporting standards as set forth in 310 CMR 40.0300 of the MCP.

A total of six (6) soil samples, including five (5) composite samples of the fill were submitted for chemical analyses for MCP total metals and polycyclic aromatic hydrocarbons (PAHs) and one (1) soil sample obtained from the boring B-7, which displayed high TVOC readings, was chemically tested for extractable petroleum hydrocarbons (EPH) with target analyses and volatile organic compounds (VOCs).

Within the samples of the fill material, there were no concentrations that exceeded applicable MCP RCS-1 standards. However, the soil sample obtained from boring B-7, contained concentrations of EPH and VOCs above RCS-1 standards. Boring B-7 was performed in the vicinity of the school's USTs. The presence of EPH and VOC compounds in soil above applicable standards is considered an REC with respect to the subject site.

SUMMARY OF MCP NOTIFICATION REQUIREMENTS

Based on our observations of conditions at or near the subject site and the results of laboratory analysis performed on samples of soil obtained from the subject site, the EPH and VOC compounds identified in soil were detected at levels that require notification of the DEP within 120 days.

DATA GAPS

In accordance with ASTM E 1527-13, the Phase I report shall identify and comment on any significant data gaps that affect the ability of the environmental professional to identify RECs. No User Questionnaire was completed for this Phase I Environmental Site Assessment. The User Questionnaire is contained in Appendix X.3 of ASTM E 1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. Since this questionnaire has not been completed, it is considered a data gap with regard to the subject site. However, based on a review of all other available resources and documents, this data gap is not considered to be significant.

SUMMARY AND CONCLUSIONS

A Phase I Environmental Site Assessment has been completed for the Edward Devotion School located at 345 Harvard Street in Brookline, Massachusetts. The purpose of this report was to assess the site for the presence of Recognized Environmental Conditions at the subject site or surrounding properties that may potentially pose a threat to the subject site. This Phase I Report was prepared in a manner that conforms with the ASTM 1527-13 standard for Phase I Environmental Site Assessment (ESA) reporting, as referenced in 40 CMR Part 312 (the All Appropriate Inquiries Rule).

Our assessment included a visual reconnaissance of the subject site and the surrounding areas, a review of the site history relative to the possible presence of oil and hazardous materials, a review of readily available municipal, state and federal records, a review of reports previously prepared for the subject site and a review of a database search completed by EDR Sanborn, Inc. of Milford, Connecticut in accordance with the applicable ASTM 1527-13 criteria.

Fronting onto Harvard Street to the southwest, the subject site consists of one (1) parcel of land containing the Edward Devotion School and is bounded by Babcock Street to the east, Stedman Street to the west, and residential properties to the north.

A visual reconnaissance of the subject site was conducted on February 25, 2014 by a representative of McPhail. Observations during our site reconnaissance included one end of a crawl space which runs beneath the eastern wing of the school. According to Mr. Hoogasian, the soil in the crawl space has tested positive for asbestos. The presence of asbestos in soil beneath the eastern wing of the school is considered to pose a conditional threat of impact to the subject site pending future renovations plans. If future site renovations include demolition and/or subgrade construction in the area of the crawlspace, the soil which contains asbestos is considered an REC with respect to the subject site.

A review of available historical records indicates that the subject site had been mainly occupied by the Edward Devotion School from the late 1800s to the today. Surrounding properties have been predominately depicted as residences during this time period.

A review of municipal records included a review of online files at the Town of Brookline Assessor's database and records provided by the Brookline Fire Department - Fire Prevention Division and the Brookline Building and

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Health Department and Clerks office. A data gap pertaining to the documentation of two 10,000-gallon USTs has been identified. Records indicated these tanks were installed in August 1974 and no additional documentation was observed. Additionally, there is a discrepancy between the tank capacities listed on the Fire Department permit and the listed tank capacities on provided site plans. This data gap is considered an REC with respect to the subject site. We recommend a Ground Penetrating Radar (GPR) survey to be completed in the vicinity of the known USTs to assess whether one or both of the 10,000-gallon USTs installed in 1974 are still present at the subject site.

The subject site is a DEP-listed site with the assigned RTN 3-14056. This DEP- listed site associated with the subject site has achieved a Permanent Solution in the form of a Class A-2 RAO and a level of No Significant Risk exists. This release sites is therefore not considered an REC with respect to the subject site, however it is considered an HREC since it is a former release that has occurred in connection with the subject property, and has been addressed to the satisfaction of the applicable regulatory authority. Therefore, this HREC is not considered to pose a threat of impact to the subject site.

Based on a review of the on-line DEP Release Site database, no RECs in connection with the subject site were identified.

A subsurface exploration program, consisting of the advancement of borings, was performed at the subject site in February 2014. Our study included laboratory testing of soil for disposal purposes. The soil samples were obtained as part of the above referenced subsurface exploration program and included a total of six (6) soil samples, including five (5) composite samples of the fill were submitted for chemical analyses for MCP total metals and polycyclic aromatic hydrocarbons (PAHs) and one (1) soil sample obtained from the boring B-7, which displayed high TVOC readings, was chemically tested for extractable petroleum hydrocarbons (EPH) with target analyses and volatile organic compounds (VOCs).

The results of the soil laboratory testing of identified that within the samples of the fill material, there were no concentrations that exceeded applicable MCP RCS-1 standards. However, the soil sample obtained from boring B-7 contained concentrations of EPH and VOCs above RCS-1 standards. Boring B-7 was performed in the vicinity of the school's USTs. The presence of EPH and VOC compounds in soil above applicable standards is considered an REC with respect to the subject site. We

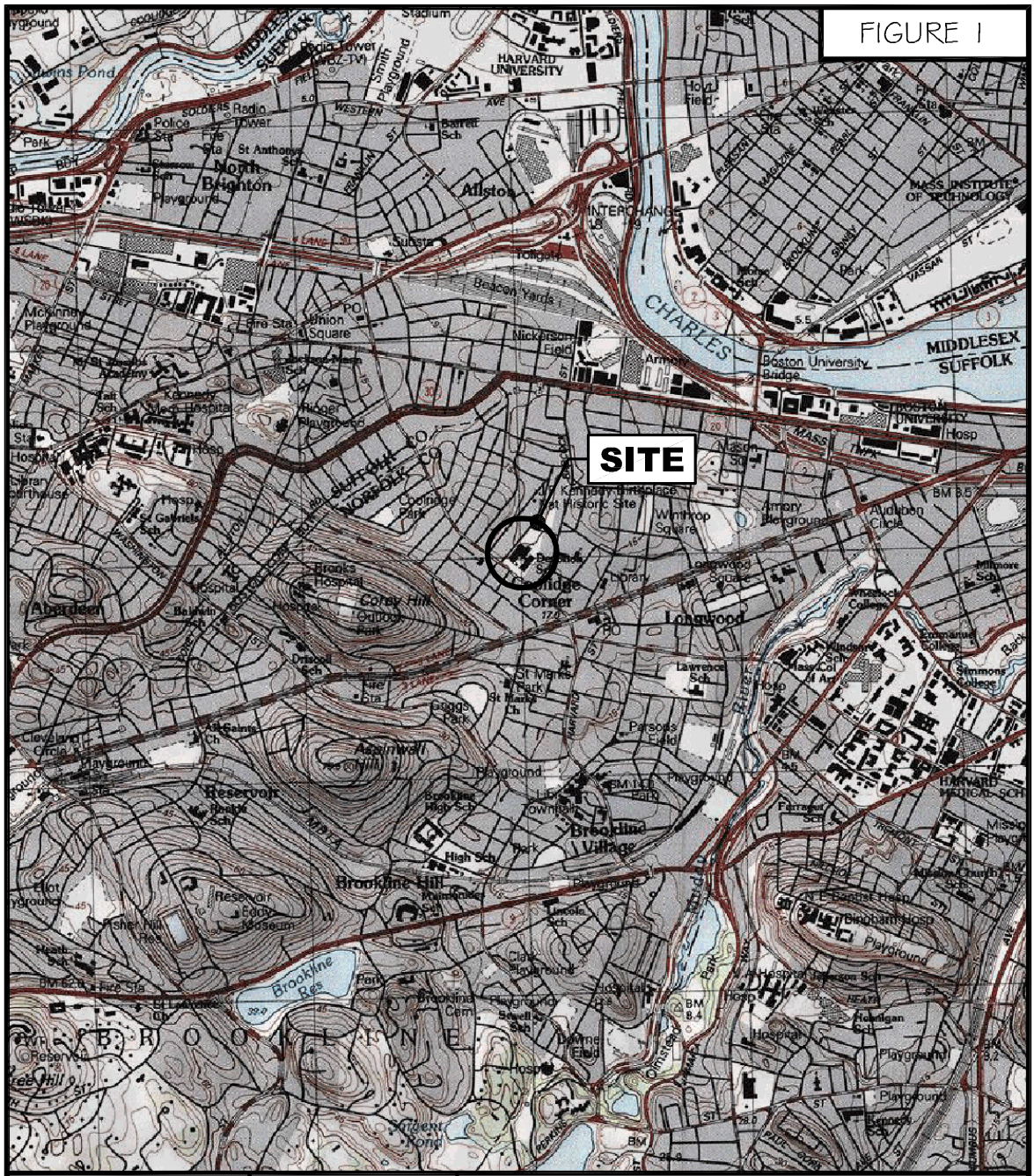
recommend additional soil and groundwater testing in the vicinity of B-7 and the current USTs to further assess this REC.

We have performed a *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at the Edward Devotion School located in Brookline, Massachusetts. This assessment has identified three (3) *recognized environmental conditions* in connection with the *subject site*.

ENVIRONMENTAL PROFESSIONAL STATEMENT

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312. Further, I have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Ambrose J. Donovan L.S.P., P.E.
Environmental Professional



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SCALE 1:25,000

PROJECT LOCATION PLAN

EDWARD DEVOTION SCHOOL

BROOCKLINE MASSACHUSETTS

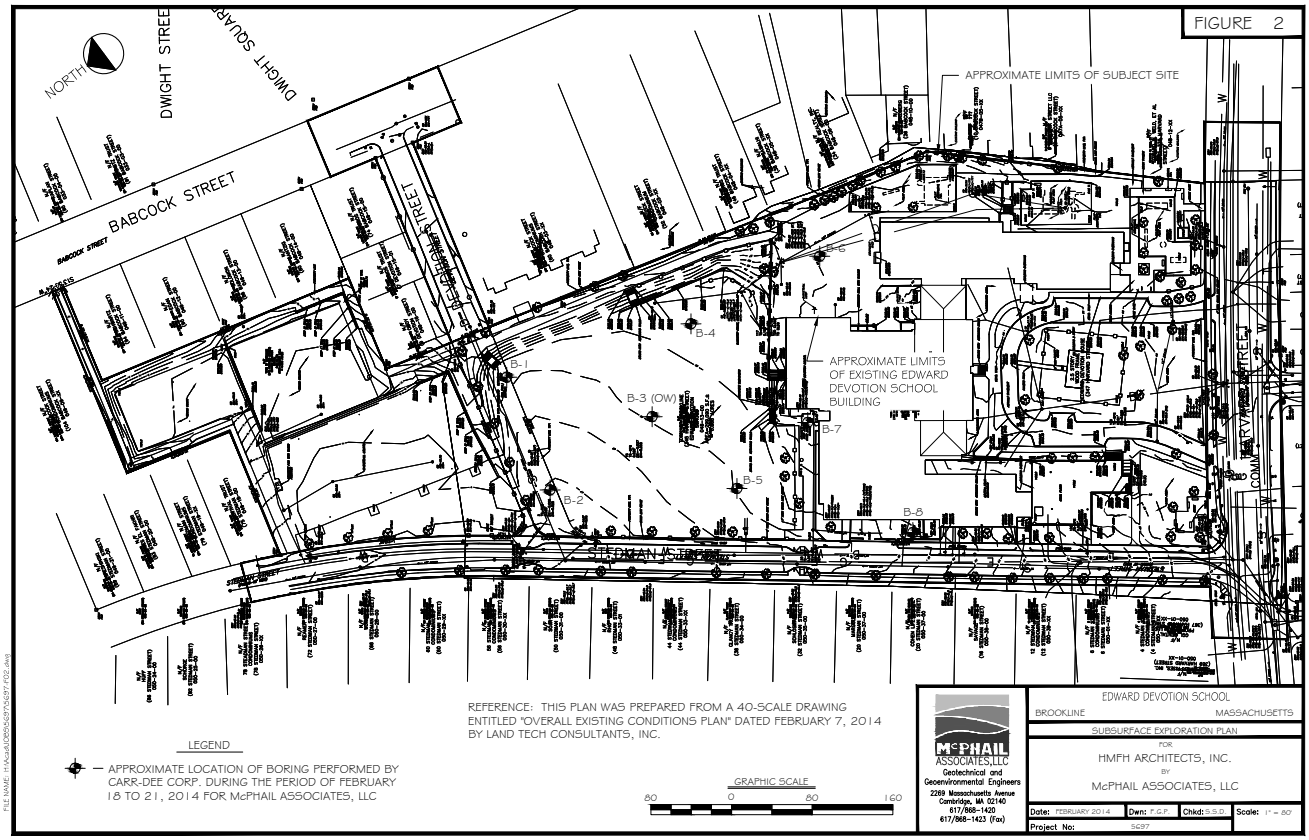
FIGURE 2
NORTH
DWIGHT STREET
DWIGHT SQUARE
BABCOCK STREET
APPROXIMATE LIMITS OF SUBJECT SITE
APPROXIMATE LIMITS OF EXISTING EDWARD DEVOTION SCHOOL BUILDING
B-1
B-2
B-3 (OW)
B-4
B-5
B-6
B-7
B-8
B-9
REFERENCE: THIS PLAN WAS PREPARED FROM A 40-SCALE DRAWING ENTITLED "OVERALL EXISTING CONDITIONS PLAN" DATED FEBRUARY 7, 2014 BY LAND TECH CONSULTANTS, INC.
LEGEND
APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. DURING THE PERIOD OF FEBRUARY 18 TO 21, 2014 FOR McPHAIL ASSOCIATES, LLC
GRAPHIC SCALE
80 0 80 160
McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (fax)
EDWARD DEVOTION SCHOOL
BROOKLINE MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN
FOR
HMFH ARCHITECTS, INC.
BY
McPHAIL ASSOCIATES, LLC
Date: FEBRUARY 2014
Dwn: T.G.P.
Chkd: S.S.D.
Scale: 1" = 80'
Project No: SG97

TABLE 1
Headspace Readings in Sample Jars

Edward Devotion School
Brookline, Massachusetts
Project No. 5697

EXPLORATION NO.	SAMPLE NO.	DEPTH [FEET]	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY PETROLEUM EVIDENCE
B-1	*BACKGROUND*			*0*	
	S-1	0-2	FILL	0.1	
	S-2	2-3.5	FILL	0.0	
	S-2a	3.5-4	MARINE SAND	0.0	
	S-3	5-7	MARINE SAND	0.0	
	S-4	10-11.5	MARINE SAND	0.0	
	S-4a	11.5-12	OUTWASH	0.0	
	S-5	15-17	OUTWASH	0.0	
	S-6	20-22	OUTWASH	0.0	
	S-7	22-24	OUTWASH	0.0	
B-2	*BACKGROUND*			*0*	
	S-1	0-2	FILL	0.1	
	S-2	2-4	FILL	0.0	
	S-3	4-6	FILL	0.0	
	S-4	6-8	FILL	0.0	
	S-5	8-9	ORGANICS	0.0	
	S-5a	9-10	OUTWASH	0.1	
	S-6	10-12	OUTWASH	0.3	
	S-7	15-17	OUTWASH	0.3	
	S-8	20-22	OUTWASH	0.2	
B-3(OW)	*BACKGROUND*			*0*	
	S-1	0-2	FILL	0.0	
	S-2	2-4	FILL	0.0	
	S-3	4-6	MARINE SAND	0.0	
	S-4	10-12	MARINE SAND	0.0	
	S-5	15-17	OUTWASH	0.0	
	S-6	20-22	OUTWASH	0.0	
B-4	*BACKGROUND*			*0*	
	S-1	0-2	FILL	0.0	
	S-2	2-4	FILL	0.1	
	S-3	4-6	MARINE SAND	0.0	
	S-4	10-12	OUTWASH	0.0	
	S-5	15-17	OUTWASH	0.2	
	S-6	20-22	OUTWASH	0.3	
B-5	*BACKGROUND*			*0*	
	S-1	0-2	FILL	0.0	
	S-2	2-4	FILL	0.0	
	S-3	4-5.5	FILL	0.1	
	S-3a	5.5-6	OUTWASH	0.1	
	S-4	6-8	OUTWASH	0.1	
	S-5	10-12	OUTWASH	0.3	
	S-6	15-17	OUTWASH	0.1	
	S-7	20-22	OUTWASH	0.0	

Equipment: hnu Model PI 101 Photoionization
Detector with 10.2 eV Probe, or
Thermo Environmental Model 580B
Organic Volatile Meter (OVM)
with 10.6 eV Probe

PPM = Parts Per Million

McPhail Associates, Inc.

Page 1 of 2
3/4/2014

TABLE 1
Headspace Readings in Sample Jars

Edward Devotion School
Brookline, Massachusetts
Project No. 5697

EXPLORATION NO.	SAMPLE NO.	DEPTH [FEET]	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY PETROLEUM EVIDENCE
B-6	*BACKGROUND*			*0*	
	S-1	0.5-2	FILL	3.5	
	S-2	2-4	FILL	3.0	
	S-3	4-4.4	FILL	0.0	
	S-4	5-6.8	OUTWASH	1.5	
	S-5	10-12	OUTWASH	0.2	
	S-6	15-16.5	OUTWASH	1.8	
	S-6a	16.5-17	OUTWASH	1.2	
	S-7	20-22	OUTWASH	0.4	
B-7	*BACKGROUND*			*0*	
	S-1	0.5-2	FILL	0.1	
	S-2	2-4	FILL	0.2	
	S-3	4-6	FILL	0.4	
	S-4	6-8	FILL	0.1	
	S-5	8-10	FILL	21.9	Hydrocarbon Odor
	S-6	10-11.4	OUTWASH	117.9	Hydrocarbon Odor
	S-7	14.5-14.6	OUTWASH	-	No Sample Recovery
B-8	*BACKGROUND*			*0*	
	S-1	0.5-2	FILL	0.1	
	S-2	2-4	FILL	1.1	
	S-3	4-6	FILL	0.1	
	S-4	6-8	FILL	0.1	
	S-5	8-10	OUTWASH	0.1	
	S-6	10-12	OUTWASH	0.1	
	S-7	14-16	OUTWASH	0.2	

Equipment: hnu Model PI 101 Photoionization
Detector with 10.2 eV Probe, or
Thermo Environmental Model 580B
Organic Volatile Meter (OVM)
with 10.6 eV Probe

PPM = Parts Per Million

TABLE 2
Analytical Results - Soil

Edward Devotion School
Brookline, Massachusetts
Project No. 5697

LOCATION	Massachusetts Reportable Concentration RCS-1-08	B-1	B-3	B-5	B-6 0'-4.5' FILL	B-10 0'-8' FILL	B-7 10'-11.4
SAMPLING DATE		2/18/2014	2/18/2014	2/19/2014	2/24/2014	2/20/2014	2/21/2014
LAB SAMPLE ID		L1403719-01	L1403719-02	L1403797-01	L1403996-01	L1403996-02	L1403996-03
SAMPLE TYPE		FILL	FILL	FILL	FILL	FILL	FILL
SAMPLE DEPTH (ft.)		0'-3.5'	0'-4'	0'-5.5'	0'-4.5'	0'-8'	10'-11.4'
General Chemistry							
Solids, Total		80.8	85.6	82	90.2	68.6	78.4
MCP Total Metals							
Arsenic, Total	20	4.2	5.2	3.9	2.6	15	-
Barium, Total	1000	33	24	27	7.5	50	-
Cadmium, Total	2	0.72	0.59	0.53	ND(0.42)	0.92	-
Chromium, Total	30	15	13	11	7.3	22	-
Lead, Total	300	25	21	36	14	17	-
Mercury, Total	20	ND(0.085)	ND(0.08)	0.102	ND(0.08)	ND(0.093)	-
Selenium, Total	400	ND(2.4)	ND(2.2)	ND(2.4)	ND(2.1)	ND(2.8)	-
Silver, Total	100	ND(0.48)	ND(0.45)	ND(0.48)	ND(0.42)	ND(0.55)	-
MCP Volatile Organics by 5035 High							
Methylene chloride	0.1	-	-	-	-	-	**ND(10)**
1,1-Dichloroethane	0.4	-	-	-	-	-	**ND(1.6)**
Chloroform	0.4	-	-	-	-	-	**ND(1.6)**
Carbon tetrachloride	10	-	-	-	-	-	ND(1)
1,2-Dichloropropane	0.1	-	-	-	-	-	**ND(3.6)**
Dibromochloromethane	0.005	-	-	-	-	-	**ND(1)**
1,1,2-Trichloroethane	0.1	-	-	-	-	-	**ND(1.6)**
Tetrachloroethene	1	-	-	-	-	-	**ND(1)**
Chlorobenzene	1	-	-	-	-	-	**ND(1)**
Trichlorofluoromethane		-	-	-	-	-	ND(4.2)
1,2-Dichloroethane	0.1	-	-	-	-	-	**ND(1)**
1,1,1-Trichloroethane	30	-	-	-	-	-	ND(1)
Bromodichloromethane	0.1	-	-	-	-	-	**ND(1)**
trans-1,3-Dichloropropene	0.01	-	-	-	-	-	**ND(1)**
cis-1,3-Dichloropropene	0.01	-	-	-	-	-	**ND(1)**
1,1-Dichloropropene		-	-	-	-	-	ND(4.2)
Bromoform	0.1	-	-	-	-	-	**ND(4.2)**
1,1,2,2-Tetrachloroethane	0.005	-	-	-	-	-	**ND(1)**
Benzene	2	-	-	-	-	-	ND(1)
Toluene	30	-	-	-	-	-	ND(1.6)
Ethylbenzene	40	-	-	-	-	-	ND(1)
Chloromethane		-	-	-	-	-	ND(4.2)
Bromomethane	0.5	-	-	-	-	-	**ND(2.1)**
Vinyl chloride	0.6	-	-	-	-	-	**ND(2.1)**
Chloroethane		-	-	-	-	-	ND(2.1)
1,1-Dichloroethene	3	-	-	-	-	-	ND(1)
trans-1,2-Dichloroethene	1	-	-	-	-	-	**ND(1.6)**
Trichloroethene	0.3	-	-	-	-	-	**ND(1)**
1,2-Dichlorobenzene	9	-	-	-	-	-	ND(4.2)
1,3-Dichlorobenzene	1	-	-	-	-	-	**ND(4.2)**
1,4-Dichlorobenzene	0.7	-	-	-	-	-	**ND(4.2)**
Methyl tert butyl ether	0.1	-	-	-	-	-	**ND(2.1)**
p/m-Xylene	400	-	-	-	-	-	ND(2.1)
o-Xylene	400	-	-	-	-	-	ND(2.1)
cis-1,2-Dichloroethene	0.3	-	-	-	-	-	**ND(1)**
Dibromomethane		-	-	-	-	-	ND(4.2)
1,2,3-Trichloropropane		-	-	-	-	-	ND(4.2)
Styrene	3	-	-	-	-	-	ND(2.1)
Dichlorodifluoromethane		-	-	-	-	-	ND(10)
Acetone	6	-	-	-	-	-	**ND(37)**
Carbon disulfide		-	-	-	-	-	ND(4.2)
Methyl ethyl ketone	4	-	-	-	-	-	**ND(10)**
Methyl isobutyl ketone	0.4	-	-	-	-	-	**ND(10)**
2-Hexanone		-	-	-	-	-	ND(10)
Bromochloromethane		-	-	-	-	-	ND(4.2)
Tetrahydrofuran		-	-	-	-	-	ND(4.2)
2,2-Dichloropropane		-	-	-	-	-	ND(5.2)
1,2-Dibromoethane	0.1	-	-	-	-	-	**ND(4.2)**
1,3-Dichloropropane		-	-	-	-	-	ND(4.2)
1,1,1,2-Tetrachloroethane	0.1	-	-	-	-	-	**ND(1)**
Bromobenzene		-	-	-	-	-	ND(5.2)
n-Butylbenzene		-	-	-	-	-	ND(1)
sec-Butylbenzene		-	-	-	-	-	ND(1)
tert-Butylbenzene		-	-	-	-	-	ND(4.2)
o-Chlorotoluene		-	-	-	-	-	ND(4.2)
p-Chlorotoluene		-	-	-	-	-	ND(4.2)
1,2-Dibromo-3-chloropropane		-	-	-	-	-	ND(4.2)
Hexachlorobutadiene	6	-	-	-	-	-	ND(4.2)
Isopropylbenzene		-	-	-	-	-	ND(1)
p-Isopropyltoluene		-	-	-	-	-	1.8
Naphthalene	4	-	-	-	-	-	**38**
n-Propylbenzene		-	-	-	-	-	ND(1)
1,2,3-Trichlorobenzene		-	-	-	-	-	ND(4.2)
1,2,4-Trichlorobenzene	2	-	-	-	-	-	**ND(4.2)**
1,3,5-Trimethylbenzene		-	-	-	-	-	5.7
1,2,4-Trimethylbenzene		-	-	-	-	-	15
Diethyl ether		-	-	-	-	-	ND(5.2)
Diisopropyl Ether		-	-	-	-	-	ND(4.2)
Ethyl-Tert-Butyl-Ether		-	-	-	-	-	ND(4.2)
Tertiary-Amyl Methyl Ether		-	-	-	-	-	ND(4.2)
1,4-Dioxane	0.2	-	-	-	-	-	**ND(100)**
SUM		-	-	-	-	-	60.5
Extractable Petroleum Hydrocarbons							
C9-C18 Aliphatics	1000	-	-	-	-	-	**2070**
C19-C36 Aliphatics	3000	-	-	-	-	-	1280
C11-C22 Aromatics		-	-	-	-	-	2230
C11-C22 Aromatics, Adjusted	1000	-	-	-	-	-	**2140**
Naphthalene	4	-	-	-	-	-	**9.95**
2-Methylnaphthalene	0.7	-	-	-	-	-	**62.9**
Acenaphthylene	1	-	-	-	-	-	**ND(2.04)**
Acenaphthene	4	-	-	-	-	-	**4.15**
Fluorene	1000	-	-	-	-	-	5.97
Phenanthrene	10	-	-	-	-	-	7.36
Anthracene	1000	-	-	-	-	-	ND(2.04)
Fluoranthene	1000	-	-	-	-	-	ND(2.04)
Pyrene	1000	-	-	-	-	-	ND(2.04)
Benzo(a)anthracene	7	-	-	-	-	-	ND(2.04)
Chrysene	70	-	-	-	-	-	ND(2.04)
Benzo(b)fluoranthene	7	-	-	-	-	-	ND(2.04)
Benzo(k)fluoranthene	70	-	-	-	-	-	ND(2.04)
Benzo(a)pyrene	2	-	-	-	-	-	**ND(2.04)**

McPhail Associates, Inc.

Page 1 of 2
3/4/2014

TABLE 2
Analytical Results - Soil

Edward Devotion School
Brookline, Massachusetts
Project No. 5697

Indeno(1,2,3-cd)Pyrene	7	-	-	-	-	-	ND(2.04)
Dibenzo(a,h)anthracene	0.7	-	-	-	-	-	**ND(2.04)**
Benzo(ghi)perylene	1000	-	-	-	-	-	ND(2.04)
MCP PAHs							
Acenaphthene	4	ND(0.16)	ND(0.15)	ND(0.16)	ND(0.29)	ND(0.19)	-
Fluoranthene	1000	0.44	0.12	ND(0.12)	ND(0.22)	ND(0.14)	-
Naphthalene	4	ND(0.2)	ND(0.19)	ND(0.2)	ND(0.36)	ND(0.24)	-
Benzo(a)anthracene	7	0.2	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Benzo(a)pyrene	2	0.19	ND(0.15)	ND(0.16)	ND(0.29)	ND(0.19)	-
Benzo(b)fluoranthene	7	0.24	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Benzo(k)fluoranthene	70	ND(0.12)	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Chrysene	70	0.22	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Acenaphthylene	1	ND(0.16)	ND(0.15)	ND(0.16)	ND(0.29)	ND(0.19)	-
Anthracene	1000	ND(0.12)	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Benzo(ghi)perylene	1000	ND(0.16)	ND(0.15)	ND(0.16)	ND(0.29)	ND(0.19)	-
Fluorene	1000	ND(0.2)	ND(0.19)	ND(0.2)	ND(0.36)	ND(0.24)	-
Phenanthrene	10	0.2	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Dibenzo(a,h)anthracene	0.7	ND(0.12)	ND(0.11)	ND(0.12)	ND(0.22)	ND(0.14)	-
Indeno(1,2,3-cd)Pyrene	7	ND(0.16)	ND(0.15)	ND(0.16)	ND(0.29)	ND(0.19)	-
Pyrene	1000	0.36	0.11	ND(0.12)	ND(0.22)	ND(0.14)	-
2-Methylnaphthalene	0.7	ND(0.24)	ND(0.23)	ND(0.24)	ND(0.44)	ND(0.29)	-
SUM		1.85	0.23	-	-	-	

McPHAIL ASSOCIATES, LLC

APPENDIX A

Limitations

McPHAIL ASSOCIATES, LLC

Limitations

The purpose of this report was to assess the physical characteristics of the property identified as the Edward Devotion School, located at 345 Harvard Street in Brookline, Massachusetts, with regard to the provisions contained in Massachusetts General Laws Chapter 21E and the Massachusetts Contingency Plan, 310 CMR 40.0000. In addition, the site assessment was performed in general conformance to ASTM E1527-13 Standard Practice - Phase I Environmental Site Assessment.

No attempt was made to check on the compliance of present or past owners of the site with federal, state or local laws and regulations except as otherwise documented herein. Further, our scope of services did not include a title search, documentation of the presence at the subject site of lead-based paint, mold, mildew, asbestos containing materials or naturally occurring pollutants such as radon gas.

The site observations were made under the conditions stated in this report. The conclusions presented in the text are based solely on the scope of work conducted and on the observations stated in the report.

This study and report have been prepared on behalf of and for the exclusive use of HMFH Architects, Inc., solely for use in an environmental assessment of the above referenced property. This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party nor used in whole or in part by any other party without prior written consent of McPhail Associates, LLC This report has been prepared in accordance with current generally accepted geoenvironmental practices. No other warranty, expressed or implied, is made.

Appendix F

Existing Conditions Structural Report

Existing Conditions Structural Report 124

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EDWARD DEVOTION SCHOOL
Brookline, Massachusetts

Existing Conditions Structural Report
March 10, 2014

INTRODUCTION

Foley Buhl Roberts & Associates, Inc. (FBRA) is collaborating with *HMFH Architects, Inc. (HMFH)* in the review and evaluation of structural issues/conditions at the Edward Devotion School in Brookline. The purpose of this report is to identify and describe the structural systems of the various wings of the facility and to comment on the structural issues/conditions observed. General comments relating to potential renovations, alterations and additions to the school (governed by the Massachusetts Existing Building Code (MEBC – 8th Edition)) are presented as well. The evaluation of potential renovation/addition schemes is addressed in a separate structural narrative.

The Edward Devotion School is located at 345 Harvard Street in Brookline, MA. The present school consists of the original building, along with the 1954 and 1974 additions on the east and west sides, respectively. The Edward Devotion School is the largest elementary school in Brookline and is home to over 700 Pre-K through 8th Grade students. The facility was constructed on a sloping site (downwards to the north and west, approximately one story) and has a gross floor area of approximately 162,051 square feet on three levels. Increased enrollments have created overcrowded conditions in the school and building systems are in need of replacement.

Structural conditions at the Edward Devotion School were originally reviewed at the site by FBRA on February 24, 2012, in conjunction with a previous study. A subsequent visit to the facility was conducted on February 4, 2014 to further review structural conditions and to determine if previously noted conditions had significantly changed. Our observations of the existing floor and roof structure were limited, as many areas were obscured by finishes.

The following documents were reviewed in the preparation of this Existing Conditions Structural Report:

> *Alterations & Additions to Edward Devotion School:* Structural Drawings S-1 through S-11, prepared by John R. Nichols and Paul W. Norton Structural Engineers, Boston, Massachusetts, dated September 30, 1952.
>
> *Alterations & Additions to Edward Devotion School:* Plot Plan, prepared by Somes, Griswold, Boyden, Wilde & Ames Architects, Boston, Massachusetts, dated February 9, 1953.
>
> *Additions & Alterations to The Edward Devotion School:* Structural Drawings S-1 through S-5 and selected Architectural Drawings, prepared by the joint venture of Peirce & Pierce and Korslund, LeNormand & Quann, Inc., Boston, Massachusetts, dated February 14, 1974. These drawings appear to be a progress set and are incomplete.

No exploratory demolition or structural materials testing was performed in conjunction with this review. A preliminary evaluation of subsurface soils and groundwater conditions was recently conducted by McPhail Associates, LLC; comments and recommendations are summarized in their *Preliminary Foundation Engineering Report* dated March 3, 2014.

GENERAL DESCRIPTION

The Edward Devotion School was founded in 1894, on land bequeathed to the Town of Brookline by Edward Devotion. Edward Devotion's dwelling (Circa 1680) remains on the property, in the forecourt of the school, and is one of the oldest colonial structures in Brookline.

The original school building (Central Wing) is a concrete and steel framed structure with areas of wood framed floor and a wood roof, supported by (unreinforced) brick masonry bearing walls and by steel beams and columns (in limited locations). The date of this construction is unknown; however, it is thought to be circa 1913. The building is presumably supported on a spread footing (perhaps granite block) foundation.

Several additions to the original building were constructed in 1954. A split-level, concrete and steel framed, two and three-story classroom addition (south section and north sections, respectively) was constructed to the east of the original school. The southern section of the 1954 East Wing was constructed over the footprint of the original wing (Circa 1892) and re-used certain, existing foundation walls. The existing slab on grade was locally demolished to accommodate new interior spread footings, supporting the columns of the new addition. The Ground Floor of this section was structured with reinforced concrete slabs and beams (supported at the building perimeter by the existing foundation walls), creating a 6+/- feet deep crawl space. The Ground Floor of the northern section was similarly framed over a 4+/- feet deep crawl space; however, all foundations/walls were new construction. A new, steel framed Gymnasium was also constructed in 1954, located on the north (back) side of the original school building (Central Wing). Limited renovations to the original building were also conducted. Localized renovations to the original West Wing (Circa 1898) were undertaken in 1954 as well.

The original West Wing was subsequently damaged by fire and replaced with new construction in 1974. The 1974 West Wing is a three-story, concrete (cast-in-place and precast plank) and steel framed structure with an enclosed parking level below and a Mechanical Penthouse at the roof level. Foundations for the West Wing are conventional spread footings. Two Cafeterias are located at the First Floor of this wing and open classroom spaces are located at the Second and Third Floors above. An elevator was installed in this wing, adjacent to the original school building. A new floor was constructed in the double-height assembly space in the original building at this time as well, creating a Library at the Second Floor (Entry) level and a large group assembly/instruction space above, at the Third Floor.

Story heights vary throughout the different wings of the school. At the 1954 East Wing, typical story heights range from 9'-3" (lower roof, north section) to 13'-6". Story heights at the 1974 West Wing vary from 10'-0" in the Garage to 13'-6" (Second Floor to Third Floor). The Second and Third Floor levels of the original school align with those in the East and West Wings (13'-6" story height).

STRUCTURAL SYSTEMS DESCRIPTION

Original Building (Central Wing)

Structural Materials: No original Structural Drawings were available; however, based on historical information and the Building Code in effect at the (assumed) time of construction, material strengths are expected to be the following:

Concrete:	2,500+/- psi compressive strength
Steel Reinforcing:	16,000+/- psi allowable tension stress
Structural Steel:	16,000+/- psi allowable tension stress (bending)

EDWARD DEVOTION SCHOOL
Brookline, Massachusetts

Existing Conditions Structural Report
March 10, 2014

Page 3 of 10

Wood:	1,200+/- psi allowable bending stress

Design Live Loads: No original Structural Drawings were available; however, the Building Law of the City of Boston (Early 1900's) required the following loads:

Roofs:	40 psf (No provision for drifting snow)
Classrooms	60 psf
Stairs:	70 psf
Balconies:	70 psf
Assembly Areas:	125 psf

As details of the existing structure could not be determined in the field and no original Structural Drawings were available, FBRA was not able to run structural calculations to determine/confirm the design live loads. A program of structural investigations would need to be conducted (beyond the scope of this report) to make such a determination. Note that buildings constructed during this era were not designed for lateral (wind and seismic) loading.

Expansion Joints: There are no internal expansion joints in the building; however, the 1974 West Wing is separated from the original building by a 1" expansion joint (inadequate width, with respect to current Building Codes). The 1954 East Wing appears to be structurally connected to the original building.

Roof Construction: The front (south) section of the roof is sloped and is wood framed, with wood (board) sheathing, rafters, beams and trusses. Snow guards (rail type) are present at the roof perimeter. A wood framed, copper clad clock tower was constructed at the east-west center of this roof section. There are double, masonry chimneys at the east and west ends of the front roof. To the north, the roof is generally flat; presumably wood framed as well. The masonry boiler flue is at the northern edge of this roof section, at the interface of the roof and the 1954 Gymnasium addition.

Upper Floor Construction (Second and Third Floors): Original Floor construction at these levels appears to be a mixture of concrete slab and wood framed construction, supported masonry bearing walls. The 1974 Third Floor construction (infilled over the present Library) is steel framed, with a 3" thick concrete slab on steel forms, supported by open web steel joists (spaced at 2'-6" o.c.) which span to wide flange steel beams. Steel beams are supported on the original (unreinforced) masonry bearing walls and new, interior steel columns.

First Floor Construction: Original First Floor construction appears to be a concrete slab, with areas of wood framing, similar to the levels above. A new floor was constructed over the old Gymnasium, when the larger Gymnasium was added in 1954. This infilled construction consists of a 4" thick, one-way, reinforced concrete slab, supported by steel beams. Steel beams rest on the original masonry bearing walls and two, interior steel columns.

Lowest Level Floor Construction: Floor construction at the Boiler Room, Mechanical Rooms and the small Gymnasium is presumably a concrete slab on grade (thickness unknown).

Exterior Wall Construction is a solid brick masonry barrier wall. Wall thickness varies; actual thicknesses were not determined at the site.

Subsurface Soils: No original subsurface soils information was available; however, foundations for the 1954 and 1974 additions are conventional spread footings. The above-referenced, *Preliminary Foundation Engineering Report* indicates that the soil profile consists of fill deposits (composed of various materials - silts, sands, gravel, ash and cinders) varying in depth from 3.5

to 10 feet. Fill deposits are underlain by organic deposits (1 to 1.5 feet thick) or by a glacial outwash deposit. The outwash deposit generally consists of sands of varying densities, with trace gravel and silt, and extends 14.6 to 24 feet below grade. Groundwater was observed in one location (an Observation Well in Boring B-3) and was found to be 16.9 feet below ground surface (Elevation +32.7 feet). Groundwater levels are expected to vary seasonally.

Foundations: Foundations for bearing walls and individual columns are assumed to be conventional spread footing construction (perhaps granite block).

Drainage: The presence of a perimeter foundation drainage system could not be determined.

Fire Resistance*:* Typical reinforced concrete floor construction likely has a fire resistance rating of at least one hour. Details of the enclosure/protection for steel beams and columns were not determined; accordingly, the fire resistance rating of these elements is unknown. Combustible wood framing (partial floors and roof) has no fire resistance rating, except to the extent that it is protected by the original plaster ceiling construction. The building is partially sprinklered.

Lateral Load Resistance: The original Edward Devotion School building was designed and constructed prior to the introduction of seismic design codes. Wind loads were not considered in the design of low-rise buildings of this era. Accordingly, there is no defined lateral load resisting system. Interior and perimeter masonry walls (unreinforced) provide lateral force resistance; however, the construction of these walls does not meet current Code requirements. Lateral force resistance and unreinforced masonry wall issues will need to be addressed in conjunction with a future renovation of the building.

1954 East Wing

Structural Materials: Material strengths are noted on the original Structural Drawings; to be as follows:

Concrete:	2,500 psi compressive strength – foundations
	3,000 psi compressive strength – floors, roof & columns
	2,000 psi compressive strength – slabs on steel bar joists
Steel Reinforcing:	18,000 psi allowable tension stress (ASTM A 305)
Structural Steel:	20,000 psi allowable bending stress (assumed)

Design Live Loads: Design live loads are listed on the Structural Drawings as follows:

Roofs:	30 psf (No provision for drifting snow)
Classrooms	50 psf
Stairs and corridors:	50 psf
Library:	100 psf

Representative structural calculations generally confirm these design live loads. Floor design loads are appropriate and meet present Building Code requirements, except a 100 psf live load is currently required for stairs and First Floor corridors (80 psf live load required at upper level corridors). The roof design snow load is below the flat roof snow load required by the 8th Edition of the Massachusetts State Building Code (35 psf); however, a recent Amendment to the Building Code (fully effective July 1, 2014) has now reduced the flat roof snow load to 31 psf. Buildings of this era were not designed for lateral (wind and seismic) loading.

Expansion Joints: There are no internal expansion joints in the 1954 wing; it appears that this wing is structurally connected to the original building.

EDWARD DEVOTION SCHOOL
Brookline, Massachusetts

Existing Conditions Structural Report
March 10, 2014

Page 5 of 10

Roof Construction: Typical flat roof construction over at the south section consists of a 2" concrete slab supported by steel bar joists spaced at 20" o.c. Steel bar joists are supported by wide flange steel beams and steel columns (6" WF and 5" Lally Columns). Clerestory roof construction at the northern section consists of 4½" deep, prefabricated roof panels, spanning 13'-4" to wide flange steel beams. The lower roof of this section (above the Third Floor) is framed with 1½" deep steel roof deck typically spanning 5'-2" to wide flange steel beams. Lowest roof construction in the north section (at the Third Floor level) is similar to that used at the south section. Roof construction at the Gymnasium addition consists of an acoustical steel roof deck spanning in the east-west direction to clear spanning steel beams.

Upper Floor Construction (Second and Third Floors) typically consists of a 2" concrete slab supported by steel bar joists spaced at 20" o.c. Steel bar joists are supported by wide flange steel beams and steel columns (6" WF and 5" Lally Columns).

First Floor Construction in the north and south sections typically consists of a 5" thick, one-way reinforced concrete slab spanning 13'-4" to reinforced concrete beams. Concrete beams are supported by reinforced concrete columns and foundations walls.

Crawl Space Floor Construction consists of a 4" thick, reinforced concrete slab on grade in the north section and an existing slab on grade (4"+/- thick) in the south section.

Exterior Wall Construction is a 4" brick veneer, with an (unreinforced) concrete block (CMU) backup wall.

Subsurface Soils: The above-referenced, *Preliminary Foundation Engineering Report* indicates that the soil profile consists of fill deposits (composed of various materials - silts, sands, gravel, ash and cinders) varying in depth from 3.5 to 10 feet. Fill deposits are underlain by organic deposits (1 to 1.5 feet thick) or by a glacial outwash deposit. The outwash deposit generally consists of sands of varying densities, with trace gravel and silt, and extends 14.6 to 24 feet below grade. Groundwater was observed in one location (an Observation Well in Boring B-3) and was found to be 16.9 feet below ground surface (Elevation +32.7 feet). Groundwater levels are expected to vary seasonally.

Foundations: Spread footing foundations in this wing were proportioned on the basis of a four tons per square foot (4.0 TSF) allowable bearing capacity.

Drainage: Perimeter foundation drainage was provided along the north and east sides of this wing, as indicated on the referenced Plot Plan.

Fire Resistance*:* Reinforced concrete First Floor construction has a fire resistance rating of at least 1 hour. The Structural Drawings indicate that a rated ceiling was installed below the upper floor and roof construction, providing a 1 hour rating. Details of the enclosure/protection of the supporting columns were not determined. The building is partially sprinklered.

Lateral Load Resistance: The 1954 wing was designed and constructed prior to the introduction of seismic design codes. Wind loads were not considered in the design of low-rise buildings of this era. Accordingly, there is no defined lateral load resisting system. Interior and perimeter masonry walls (unreinforced) provide lateral force resistance; however, the construction of these walls does not meet current Code requirements. Lateral force resistance and unreinforced masonry wall issues would need to be addressed in conjunction with a future renovation of the building.

1974 West Wing

Structural Materials: Material strengths are not noted on the original Structural Drawings (there are no General Notes or Specifications). The following strengths are assumed:

Concrete:	3,000 psi	compressive strength
Steel Reinforcing:	40 ksi	yield strength
Structural Steel:	36 ksi	yield strength

Design Live Loads: Design live loads are not noted on the Structural Drawings; however, the 1974 addition was constructed in accordance with the Massachusetts School House regulations, which stipulated the required design live loads. Representative structural calculations generally confirm that the floor design is consistent with the structural requirements at the time of construction. Note that seismic design was not required for buildings designed and constructed under these regulations.

Expansion Joints: There are no internal expansion joints in the 1974 wing. A 1" expansion joint separates this wing from the original building (inadequate width, with respect to current Building Code requirements).

Roof Construction: Typical flat roof construction in the 1974 wing consists of a 1½" deep steel roof deck spanning 4 to 5 feet to open web steel bar joists. Steel joists typically span 30+/- feet in the east-west direction and are supported by wide flange steel beams. Steel beams are supported by interior and perimeter wide flange steel columns (8" or 10").

Upper Floor Construction (Second and Third Floors): Typical floor construction at these level consists of a 3" deep concrete slab on 28 gauge steel forms, spanning 2'-6" feet to open web steel bar joists. Steel joists typically span 30+/- feet in the east-west direction and are supported by wide flange steel beams. Steel beams are supported by interior and perimeter wide flange steel columns (8" or 10").

First Floor Construction over the Parking Garage consists of 10" deep precast, prestressed concrete plank (with a 2" concrete topping), typically spanning 30+/- feet to interior reinforced concrete beams and reinforced concrete foundation walls at the building perimeter. Beams are supported on (circular) reinforced concrete columns in the Parking Garage.

Parking Garage Floor Construction consists of a 5" thick concrete slab on grade reinforced welded wire fabric. The slab is pitched for drainage.

Exterior Wall Construction is a 4" brick veneer, with an 8" thick (unreinforced) concrete block (CMU) backup wall. Rigid insulation (1" thick) was provided in the cavity leaving an air space of approximately ¾". Windows in this wing are continuous; steel relieving angles have been provided to support the brick veneer over the windows.

Foundations: Foundations are conventional spread footings. The design allowable bearing capacity is not noted on the original Structural Drawings.

Drainage: It is not known if perimeter foundation drainage was provided; there is no indication of a drainage system on the Structural Drawings.

Fire Resistance: Precast, prestressed concrete plank First Floor construction has a fire resistance rating of at least 1 hour. At the upper floor and roof levels, steel beams and columns have apparently been protected by applied fireproofing. It is not clear in the documents, how the

open web steel bar joists are protected (ceiling construction does not appear to be fire rated). The 1974 construction is sprinklered.

Lateral Load Resistance: The 1974 wing was designed and constructed prior to the introduction of seismic design codes. There is no clearly defined lateral load resisting system. Interior and perimeter masonry walls (unreinforced) provide lateral force resistance; however, the construction of these walls does not meet current Code requirements. Lateral force resistance and unreinforced masonry wall issues would need to be addressed in conjunction with a future renovation of the building.

STRUCTURAL CONDITION/COMMENTS

Structural Conditions at the Edward Devotion School were reviewed at the site (to the extent possible) on February 24, 2012 and again on February 4, 2014. Generally speaking, floor and roof construction appears to be in satisfactory condition; there is no evidence of structural distress that would indicate significantly overstressed, deteriorated or failed structural members.

Foundations appear to be performing adequately; there are no signs of significant, total or differential settlements.

Floors and roofs appear to have been constructed in general accordance with the original framing drawings.

Structural/structurally related conditions observed during our 2012 and 2014 site visits are noted below:

1. Building Exterior: Conditions observed include the following:

    - Repointing of the brick veneer is required at various locations. Stone joints of the original building (Central Wing) generally appear to be in satisfactory condition.

    - Control joints were observed in the brick facades of both 1954 and 1974 construction. Control joints generally appear to be performing as intended. A crack in the veneer was observed below a window at the southeast corner of the 1954 East Wing, where no control joint was provided.

    - Relieving angles in the 1974 addition (West Wing) generally appear to be in satisfactory condition; however, painting is recommended. Weep holes have been provided and appear to be functioning properly. Caulking at control joints has failed in a number of locations; re-caulking is required to prevent water infiltration.

    - Site walls and entry stairs constructed with the 1974 addition have cracked and deteriorated - repair is required. Railings attached to these walls do not meet Building Code requirements and have deteriorated/failed in a number of locations. Conditions have continued to deteriorate since our initial review in 2012 and will continue to do so at an increasing rate, if not addressed.

    - There are a few areas where the face of the brick veneer has spalled.

    - Steel windows of the 1954 wing are rusting and should be further evaluated. These windows would be replaced in a major renovation of the building. Caulking around the windows has deteriorated or failed in a number of locations.

- A column supporting the south entry canopy of the 1954 wing has rusted at the top; however, this condition does not appear to be structurally significant.

- Areaways and below grade exterior stairwells should be cleaned of debris and plant material to ensure that they drain properly.

2. Roof: Access to the roof was gained through a stairway in the 1974 addition. A membrane roof was observed in most locations and appears to be in satisfactory condition (age unknown). The various roofs drain to internal drains (limited locations); typically, there are no parapets at any of the wings. Roof drainage issues should be further studied in conjunction with future renovations to the school. The slate roof of the original building appears to be in satisfactory condition – evaluation by slate roof specialist is recommended.

3. Reportedly, there were structural/stability issues with the clock tower in the early 2000's that have been rectified. Water stains were observed on the wood framing in a number of locations; however, the presence of moisture damage to members was not determined. Further review of the clock tower construction is recommended, in conjunction with future renovations to the school.

4. Foundation Drainage: As noted earlier, foundation drainage does not appear to have been provided at the original building or the 1974 West Wing construction. Water issues were briefly discussed with school personnel; water infiltration through the exterior foundation wall is occurring in the Sprinkler Room at the First Floor Level of the original building. This condition appears to be related to a downspout, which is discharging roof runoff directly into the ground adjacent to this room. Groundwater/drainage issues should be further reviewed/studied in conjunction with future renovations to the school.

5. Snow Drifting: Snow drift loading on the original building was not likely considered in the original structural design, at the junction of the front (sloping) roof and the flat roof to the north. Similarly, it does not appear that snow drift loading was considered at the lower roofs in the northern section of the 1954 East Wing. The structural evaluation of these conditions is beyond the scope of this report, but will need to be addressed if the school is renovated in the future. The 1974 West Wing addition was designed under the School House Structural Regulations in effect at the time, which required design for snow drift loading. The original Structural Drawings reflect that the roof was designed for increased loads due to drifting where required (i.e. adjacent to the rooftop Mechanical Penthouse).

6. Floor Loading Issues: The original design live loads (where known) for the framed floors of the various wings are appropriate and meet current Code requirements. There do not appear to be any issues relating to excessive loading. Floor construction is performing as intended. Loading in the Library (original building – former assembly space) appears to be reasonable and likely does not exceed the original (assembly) design load. However, since this area was not originally designed to be a Library, book loading should be controlled and monitored on a continuing basis.

7. Interior Masonry Walls: Interior (non-bearing) masonry walls are typically in satisfactory condition. A crack was observed at the southern end of the stairway connecting the north and south (offset) levels of the 1954 addition. Elsewhere, plaster cracking was observed in the east stairwell of the original building. Neither of these conditions appear to be structurally related. Generally, the anchorage/bracing of interior masonry walls as

well of the height-to-thickness ratios will need to be evaluated (per Code) if the school is renovated in the future. Masonry walls in the original building (interior and perimeter walls) will need to be anchored to the roof construction and the wood framed floor construction (limited areas in the latter case).

8. There are a number of level changes in the original school (Central Wing) which present accessibility issues. Modifications to framing may be required to address such issues if the building undergoes a significant renovation in the future.

RENOVATIONS AND ADDITIONS – MEBC REQUIREMENTS

General comments relating to potential renovations, alterations and additions to the Edward Devotion School are presented in this section. Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (MSBC – 8th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2009 *International Building Code (IBC)* and the 2009 *International Existing Building Code (IEBC)*, respectively.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods.

Regardless of the compliance method chosen, the MEBC currently requires that buildings with unreinforced masonry walls be evaluated with respect to the provisions of Appendix A1 of the IEBC (applicable to this project). An assessment of masonry shear stresses, wall slenderness, parapets, wall anchorage, diaphragm anchorage, etc. is required; and the existing building must be capable of resisting at least 75% of the seismic loading required by the Code for new construction.

The *Prescriptive Compliance Method* (IEBC Chapter 3) duplicates Sections 3403 through 3411 of Chapter 34 in the IBC and prescribes specific minimum requirements for construction related to additions, alterations, repairs, fire escapes, glass replacement, change of occupancy, historic buildings, moved buildings and accessibility. A complete structural evaluation of the building is required by the Massachusetts Amendments. If the impact of the proposed alterations and additions to structural elements carrying gravity loads and lateral loads is minimal (less than 5% and 10% respectively), seismic upgrades to an existing building are generally not required, except for buildings with masonry walls in Massachusetts (as in this case), which must comply with the requirements of IEBC Appendix A1.

The *Work Area Compliance Method* (IEBC Chapters 4 through 12) is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations, in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings. A complete seismic evaluation of the existing building is required for the following: Level 2 alterations where the demand to capacity ratio of lateral load resisting elements has been increased by more than 10%, all Level 3 alterations, a change in occupancy to a higher category and where structurally attached additions (vertical or horizontal) are planned. A full renovation of the Edward Devotion School (i.e. any individual wing) would be classified as a Level 3 alteration. As the building has interior and exterior masonry walls, compliance with the requirements of IEBC Appendix A1 is also required.

The *Performance Compliance Method* (IEBC Chapter13) duplicates Section 3412 of Chapter 34 in the IBC and provides for evaluating a building based on fire safety, means of egress and

general safety (19 parameters total). This method allows for the evaluation of the existing building to demonstrate that proposed alterations, while not meeting new construction requirements, will maintain existing conditions to at their current levels (at a minimum) or improve conditions, as required. A structural investigation and analysis of the existing building is required to determine the adequacy of the structural systems for the proposed alteration, addition or change of occupancy. A report of the investigation and evaluation, along with proposed compliance alternatives must be submitted to the code official for approval.

As the 1974 addition is separated from the original building by an expansion joint, it is considered structurally independent and the MEBC provisions would apply separately to each building. The 1954 addition, while not structurally separated from the original building has a limited interface and could be structurally separated by constructing and independent steel support frame adjacent to the original building and cutting in a new expansion joint.

Additions:

The design and construction of any proposed addition to the Edward Devotion School would be conducted in accordance with the Code for new construction. Additions should be structurally separated from the existing, adjacent construction by an expansion (seismic) joint to avoid an increase in gravity loads or lateral loads to existing structural elements.

Renovations/Alterations:

Where proposed alterations to existing structural elements carrying gravity loads result in a stress increase of over 5%, the affected element will need to be reinforced or replaced to comply with the Code for new construction. Proposed alterations to existing structural elements carrying lateral load (i.e. masonry walls) which result in an increase in the demand - capacity ratio of over 10% should be avoided, if possible. Essentially, this means that removal of, or major alterations to the existing, unreinforced masonry walls in any of the wings should be minimized. Although the 1954 and 1974 additions have complete, gravity load carrying steel frames and the masonry walls are non-bearing, the removal or alteration of the masonry walls (particularly perimeter walls) would reduce the lateral load resistance capacity.

End of Existing Conditions Structural Report

Appendix G

Civil, MEP-FP Existing Conditions Report

Civil Existing Conditions Report 141

Fire Protection Existing Conditions Report 147

Plumbing Existing Conditions Report 149

Mechanical Existing Conditions Report 153

Electrical Existing Conditions Report 175

CIVIL- EDWARD DEVOTION SCHOOL

Nitsch Engineering has performed research of the existing site conditions and anticipated site permitting requirements for Devotion School located on Harvard Street in Brookline, Massachusetts. Nitsch Engineering's research included conversation with Peter Ditto, Director of Engineering/Transportation, and Frederick Russell, Director of Water and Sewer. Information included in this report is also based on compiled record drawings, MassGIS data, and other documentation gathered by Nitsch Engineering. The record drawings includes a plan entitled, "Overall Existing Conditions Plan: The Edward Devotion School, 345 Harvard Street, Brookline, MA," dated February 25, 2014, prepared by LandTech Consultants. A summary of our observations and findings is described below.

General Site Description

The existing Devotion School is located at 345 Harvard Street in Brookline, Massachusetts. The site is approximately 6.86 acres including the existing main building, parking areas, play fields, tennis courts, basketball courts, and associated walkways. The site is bounded by existing residences to the north, existing residences and businesses to the east, Harvard Street to the south and southwest, and Stedman Street, existing residences, and businesses to the west. The site slopes steadily west to Stedman Street, with the east edge of the site at approximate El. 64, the building at approximate El. 60, and the west edge of the site at approximate El. 46. The eastern perimeter of the site surrounding the play fields, basketball court and tennis courts appears to have a fairly steep but brief slope to the west.

Existing Site Utilities

Storm Drainage

Stormwater from the site appears to be collected by five separate drainage systems, with a separate one collecting runoff from Devotion Street.

Survey drawings from 2014 indicate that there is a stormwater main along Harvard Street that collects drainage from the south side of the building site. The building roof drainage is collected by a series of roof drains. There is a separate stormwater main along Stedman Street that collects drainage from the northwest portion of the building site. It collects roof drainage as well as site drainage from multiple catch basins. There is a stormwater main along Devotion Street that appears to collect runoff from multiple catch basins in the street. Drainage eventually ties into a drainage main in Stedman Street. Survey drawings indicate multiple catch basins within the basketball and tennis court site and it is unclear where the drainage discharges. Drainage is collected from multiple catch basins and potentially roof drains at the southeast portion of the site; it is unclear where drainage discharges.

According to information provided by the Town of Brookline, stormwater potentially discharges to the Charles River, Leverett Pond, Hall's Pond, Muddy River, Willow Pond, Sawmill Brook, and the Sargent Pond.

Sewer

The sewer system is maintained by the Sewer Division of the Town of Brookline's Department of Public Works. Sewage is conveyed into the Massachusetts Water Resources Authority (MWRA) collection and treatment system.

Survey drawings indicate the building is serviced by multiple sewer lines. A service exits the building at the northwest and ties into the sewer main in Stedman Street. A sewer main in Devotion Street also appears to tie into the main in Stedman Street. Survey drawings indicate another sewer line runs along Harvard Street.

Conversations on 2/24/2014 indicate that utilities from Devotion Street are active, and will need to be maintained or relocated. .

Water

Water for the Town of Brookline is obtained from the Quabbin Reservoir through the MWRA. The water system is maintained by the Water Division of the Department of Public Works.

Water to the existing building appears to be serviced from multiple water lines. An existing 8-inch water main in Stedman Street services the building with three connections along the west face of the building. An additional water line appears to service the Edward Devotion House. Survey drawings indicate a water line extending from Stedman Street, through a driveway north of the basketball courts, and servicing a water fountain. A water service extends from Stedman Street to the Devotion Playground north of the existing building; however it is unclear where the water service connects. It is possible this water line services water fountains at the playing fields. Survey drawings indicate the 8-inch water main in Stedman Street is serviced by a 10-inch main in Harvard Street.

Survey drawings indicate two Siamese fire connections along Stedman Street at the west face of the building. A third Siamese fire connection appears to be located on the south face of the building. It appears there are four hydrants along Stedman Street that are serviced by the 8-inch water main.

Oil and Natural Gas

Survey drawings indicate two gas mains in both Harvard and Stedman Street. Gas appears to service the Edward Devotion House from the main in Harvard Street. A gas line extends from Stedman Street and services the existing school building along the west face. The size of existing gas services are not shown on the record drawings.

Survey drawings indicate an underground fuel tank located north of the existing building.

Electrical

Survey drawings indicate that electrical service to the school is served through a single underground line extending to the southwest corner of the existing building from a line that runs along Stedman Street. This line appears to tie into an electric manhole in Stedman Street. Overhead wires extend along Stedman Street and across the Devotion playground. A telecommunications line services the building at the northwest face from a utility pole in Stedman Street. RCN and fiber optic lines service the building at the west face from a separate utility pole in Stedman Street.

Conversations on 2/24/2014 indicate that there are no utility capacity issues in the area.

Site Conditions and Operations

Soils

Based on the Natural Resources Conservation Service (NRCS) Norfolk and Suffolk Counties Soil Survey, Issued December 17, 2013, the site of the Devotion School property is classified as Urban land and Canton-Urban land complex. Canton-Urban land complex is described as having no frequency of flooding or ponding and depth to water table of more than 80 inches. This soil is mainly made up of fine sandy loam and gravelly loamy sand. The NRCS does not provide soil descriptions for the Urban land soil.

The NRCS classifies the Canton-Urban land soil as HSG 'B'. Urban land is not provided with an HSG classification. NRCS describes the soil group as follows:

Group B: Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Pavement

Based on observations made from Google Maps, the asphalt pavement in parking areas, driveways, and service drives adjacent to the school appear to be in fair condition with some cracking and degradation.

Concrete pavement in pedestrian walkways across the site appears to be in good condition.

Vehicle Access

The site currently has four vehicular access points. The site is accessed from Harvard Street and three points along Stedman Street. Access from the Harvard Street entrance appears to be utilized mostly by parents and buses for pick-up and drop-off. Parking spaces along the driveway loop appear to be set aside for handicap vehicles and visitors. Entrance and exit points along Stedman Street provide access to the underground parking garage, which may be utilized by faculty and visitors. The loading dock may also be accessed from Stedman Street. One entrance point along Stedman Street at the northern portion of the site appears to provide access to the tennis and basketball courts.

Public metered parking is allowed along Stedman Street and Harvard Street.

Emergency access to the site is available from both Stedman and Harvard Street.

Conversations at a meeting held on February 24, 2014 indicate that there is difficulty with emergency vehicle access and plowing behind the school. There are no vehicular access points directly north of the building.

Pedestrian Access

Pedestrian access to the site is available from various locations. Pedestrian crosswalks were observed at the intersection of Harvard and Stedman Street, and at multiple locations along Stedman Street.

A pedestrian walkway extends from Devotion Street to Stedman Street. Pedestrian walkways also appear to extend north of the existing building, and along the south portion of the building.

Handicap walkways generally appear to meet slope requirements for accessibility. Assessment of existing pedestrian ramps onsite is required to determine if ramps conform to ADA requirements for walkway slopes.

Conversations at a meeting held February 24, 2014 indicate that there is a security concern of public pedestrian access to the school through Devotion Street.

Preliminary Permitting Considerations

Wetlands Protection Act (310 CMR 10.00)

The Wetlands Protection Act ensures the protection of Massachusetts' inland and coastal wetlands, tidelands, great ponds, rivers, and floodplains. It regulates activities in coastal and wetlands areas, and contributes to the protection of ground and surface water quality, the prevention of flooding, and storm damage and the protection of wildlife and aquatic habitat.

A review of the Massachusetts Department of Environmental Protection (DEP) wetland layers available on the Oliver Map provided by Massachusetts Geographic Information System (MassGIS) indicates that there are no wetlands located onsite.

Surface Water Supply Protection (310 CMR 22.20)

The Massachusetts DEP ensures the protection of surface waters used as sources of drinking water supply from contamination by regulating land use and activities within critical areas of surface water sources and tributaries and associated surface water bodies to these surface water sources.

A review of the Massachusetts DEP resource layers available on the MassGIS, appear to indicate the site is NOT located within a Surface Water Supply Protection Zone.

Natural Heritage & Endangered Species Program

A review of Natural Heritage and Endangered Species Program (NHESP) data, dated October 1, 2008, published in the 13th Edition of the Massachusetts Natural Heritage Atlas and available on the Oliver Map provided by MassGIS Online, indicates that the Devotion School site is NOT a Priority Habitat of Rare Species or an Estimated Habitat of Rare Wildlife. No such areas appear within close proximity to the site.

The Oliver Map provided by MassGIS Online indicates the site is located in an area of Protected Open Space. Protected Open Space includes recreational land such as town parks, playing fields, and school fields.

Flood Plain

Based on the Flood Insurance Rate Map (FIRM), Community Panel Numbers 25021C0051E and 25021C0053E, dated July 17, 2012, the site is located mostly within Zone X (Areas determined to be outside the 0.2% annual chance floodplain).

USEPA NPDES

Construction activities that disturb more than one acre are regulated under the United States Environmental Protection Agency's (EPA) National Pollution Discharge Elimination System (NPDES) Program. In Massachusetts, the USEPA issues NPDES permits to operators of regulated construction sites. Regulated projects are required to develop and implement stormwater pollution prevention plans in order to obtain permit coverage.

Sewer Connection Permit (314 CMR 7.00)

New connections to sanitary sewers, increases in flow to existing sanitary sewers, and discharges from businesses that are not considered to be "industrial wastewater" are subject to state requirements based on their expected discharge volume:

- Discharges ≤ 15,000 gallons per day (gpd) will need only local approvals (no approvals by MassDEP)
- Discharges >15,000 gpd but ≤ 50,000 gpd must file a one-time certification statement with MassDEP within 60 days after the connection starts to be used
- Discharges of > 50,000 gpd must obtain a MassDEP permit before construction

According to the Code of Massachusetts Regulations Division of Water Pollution Control 314 CMR 7.15, projected sewer flows from school buildings are estimated as follows:

- School with cafeteria but no gymnasium or showers = 15 gpd per person
- School with cafeteria, gymnasium and showers = 20 gpd per person

The existing enrollment for the school is 842 students and 188 staff. The proposed enrollment for the school is 1,010 students and 208 staff. The existing and proposed sanitary sewer discharges are greater than 15,000 gallons per day, but fewer than 50,000 gallons per day; therefore a one-time certification statement must be filed with MassDEP within 60 days after the sanitary sewer connection starts to be used.

Zoning

The Devotion School is located within Zoning District T-5: Two-Family and Attached Single-Family. Under the Town of Brookline Zoning By-Laws, schools are permitted in all zoning districts.

Modifications to the school are expected to require Site Plan Review through the Town of Brookline Planning Board. Per Section 9.11 of the Zoning By-Law:

"A project plan application for an education use in a residence district shall be filed for any proposed development, which is an outdoor structure, exterior alteration, or addition, greater than 10,000 square feet, or any project which the Planning Director and Building Commissioner determine shall have major impacts on the surrounding neighborhood."

The application shall be filed with the Planning Director at least forty-five (45) days prior to the application for a building permit. Site Plan Review typically begins at the end of the Design Development phase of the project, and extends 2-4 months depending on the site and community constraints.

The following is a list of requirements under Zoning By-Law Articles V and VI:

Maximum Building Height: 35 feet
Minimum Frontage: 20 feet
Minimum Lot Area: 5,000 square feet
Minimum Front Yard: 25 feet
Minimum Side Yard: 20 feet
Minimum Rear Yard: 40 feet
Minimum Open Space: 30% of gross floor area (Landscaped)
Parking: One (1) space per 450 square feet of gross floor area

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Brookline, MA
Fire Protection Existing Conditions Systems Report
J#831 037 00.00
L#43240/Page 1/February 18, 2014

FIRE PROTECTION

Executive Summary:

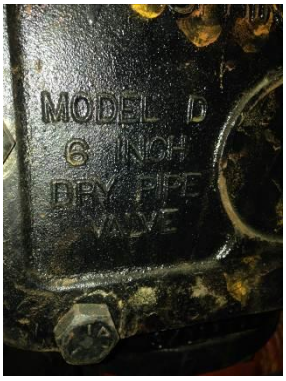
Portions of the school are protected by an automatic sprinkler system; however the building is not fully sprinklered. The majority of the equipment and systems installed appear to have been well maintained and are generally in fair to good condition.

Massachusetts code requires that any new school building or substantially renovated school building, 12,000 square feet or more must be sprinklered. If proposed scope of work is considered a major renovation then the building must be protected throughout.

Existing Conditions:

There are existing two separate 6" fire services. One service is provided for the building standpipe system. A second service is provided for the building's automatic sprinkler system. Services are protected with a double check valve assembly.

Fire Service & Double Check Valve Assembly



Dry Alarm Valve

The building is partially protected with automatic sprinklers. Sprinklers are located in the original building basement, garage, corridor, and at room egress doors. The 1975 building addition is not protected with sprinklers.

- The sprinkler system is a dry type system.
- Sprinklers in non-ceiling areas are upright type. Sprinklers in ceiling areas are pendent type.
- Sprinkler piping is black steel with threaded or coupling joints.
- Standpipes consisting of 2-1/2" hose valves are provided in the stairways.

TEL 508-998-5700 FAX 508-998-0883 email: info@g-g-d.com

Typical Upright Sprinklers

Pendent Type Sprinkler

Typical Sprinkler at Room Egress Door

Standpipe Valve

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Brookline, MA
Plumbing Existing Conditions Systems Report
J#831 037 00.00
L#43239/Page 1/February 18, 2014

PLUMBING

Executive Summary:

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the Building.

The majority of the plumbing systems are original to the building and its additions. Portions of the system have been updated as part of building renovation and upgrade projects. The plumbing systems, while continuing to function, have served their useful life. The school plumbing systems could continue to be used with maintenance and replacement of failed components; however other non-dependent decisions will likely force the plumbing upgrade. Due to its age, a complete new water piping systems are recommended.

The plumbing fixtures are in fair condition. Attempts have been made to make toilet room fixtures accessible; however, the majority of fixtures do not meet current accessibility codes. In general, the fixtures appear to have served their useful life. Fixtures in newly renovated toilet rooms are in good condition. Current Access Code requires accessible fixtures wherever plumbing is provided. In terms of the water conservation fixtures, their use is governed by the provisions of the Plumbing and Building Code. Essentially, the code does not require these fixtures to be upgraded, but where new fixtures are installed, as may be required by other codes or concerns, the new fixtures need to be water conserving type fixtures. Replacement of older fixtures is recommended.

Cast iron is used for sanitary and storm drainage. Rainwater from roof areas is collected by interior rain leaders which appear to discharge to a below grade drainage system. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper. In general, the drainage piping can be reused where adequately sized for the intended new use.

New high efficiency domestic water heating system with thermostatic mixing valves is recommended.

Fixtures:

The water closets are predominately wall hung vitreous china with manually operated flush valves. Some toilet rooms have been renovated with wall hung water closets with battery operated sensor flush valves.

Urinals are wall hung vitreous china with manually operated flush valves. Some toilet rooms have been renovated with wall hung urinals with battery operated sensor flush valves.

Lavatories are wall hung vitreous china. Lavatory faucets vary between hot and cold handle faucets, single lever metering faucets, and battery sensor faucets.

Electric water coolers are wall hung, with stainless steel bowls. Some coolers are damaged and inoperable.

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Devotion School
Brookline, MA
Plumbing Existing Conditions Systems Report
J#831 037 00.00
L#43239/Page 2/February 18, 2014

Janitor's sink are generally trap standard mounted, enameled cast iron sinks. Faucets are equipped with vacuum breakers.

Art room sinks are epoxy resin sinks. They are not fitting with sediment traps.

Kitchen area fixtures are in fair condition. The pot washing sink is fitted with an in-floor recessed grease interceptor. Kitchen does not have a dishwasher.

Typical Toilet Room Fixtures

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Brookline, MA
Plumbing Existing Conditions Systems Report
J#831 037 00.00
L#43239/Page 3/February 18, 2014

Water Systems:

The main domestic water service is 4" in size and includes a 4" meter. Valves and meter are in good condition. The main domestic cold-water distribution is 4" in size.

Piping, where exposed, appears to be copper with sweat joints. The majority of the piping is insulated.

There is a 2-1/2" reduced pressure backflow preventer (Watts #909) for the boiler water make-up system.

Domestic hot water is generated through a heat exchanger supplied by the heating boilers. There are two large storage tanks in the Mechanical room. There is a gas fired water heater located in a Storage room adjacent to the Gym. This water heater is used during summer use when boilers are not used.

The hot water systems are recirculated. There is a mixing valve on the system. Mixing valves appear antiquated.

Water Service and Meter

Hot Water Storage Tanks

Summer Water Heater

Gas:

Gas service enters the garage area. Gas system is elevated pressure; 2 PSI.

Gas piping is black steel with a combination of screwed and welded joints and fittings depending on size. Elevated gas piping is welded.

Natural gas is provided for kitchen cooking equipment.

Gas Service & Meter

Drainage Systems:

Cast iron is used for sanitary and storm drainage. Where visible, the cast iron pipe appears to be in fair condition. Smaller pipe sizes appear to be copper.

In general, the cast iron drainage piping can be reused even in a major renovation where adequately sized for the intended new use.

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Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 1/February 18, 2014

HVAC

Heating Plant:

The building is primarily heated by a gas-fired low-pressure steam boiler plant. There are two gas-fired low-pressure steam boilers located in the lower level boiler room that provide heating to the building. The boilers were manufactured by HB Smith (Model - Mills 450-21 Section) with Industrial Combustion Co. gas burners (6968 MBH gas input, 4177 MBH LPS Steam output). The boilers originally operated using fuel oil, and were converted to dual fuel. The boilers currently operate only on natural gas.

The boilers were installed circa 1953 and the burners were installed circa 1976, therefore, are approximately 61 and 38 years old respectively. The boilers and burners appear to be in poor physical condition and have exceeded their expected useful service life.

The steam boilers provide low pressure steam to hot water converters for space heating and domestic hot water heating needs of the building.

There are three fuel oil heating steam heat exchangers that were previously used to heat the old No. 6 fuel oil system. The fuel oil heaters are located on the wall of the Boiler room.

There are two steam to hot water heat exchangers located in the adjacent mechanical room which serve space perimeter radiation, hot water reheat coils, terminal heating equipment, and hot water heating for unit ventilators.

The boilers are vented by a common steel breeching system that terminates through a masonry chimney to the outdoors. Each boiler is equipped with an induced draft fan (manufactured by Auburn – Stocker Model 18B-200); the breeching and combustion fans appear to be originally installed equipment circa 1976. It appears that all code required Boiler safety devices are installed.

Existing Steam Boilers

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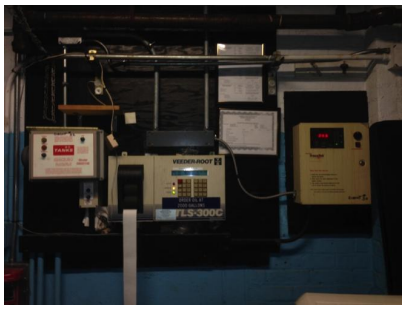
Existing Steam Boiler Control Panels (left) and Boiler Induced Draft Fan (right)

It is our understanding that the fuel oil system has been removed from service. The existing Veeder Rooter fuel oil monitoring system and fuel oil pumps have been abandoned in place. The fuel oil pumps are in poor physical condition.



Existing Fuel Oil Monitoring Panel (left) and Fuel Oil Pumps (right)

There are two steam to hot water heat exchangers (converters) located in the adjacent Mechanical room which serve space perimeter radiation, hot water reheat coils, terminal heating equipment, and hot water heating for unit ventilators. The heat exchangers were installed in 1976, and are past their expected service life.

How Water Converter (left) and Abandoned Fuel Oil Heaters (right)

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Consulting Engineers Inc.

Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 3/February 18, 2014

There is a large steam condensate return and boiler feed water tank and pump unit located adjacent to the boilers. The tank insulation has been removed, likely as part of an asbestos abatement project. The unit has three feedwater pumps. The tank appears to be originally installed equipment, circa 1953, and appears to be in poor physical condition. The 1976 design drawings do not indicate that the existing feedwater tank was to be replaced. The triplex feed water pumps appear to have been replaced since the original installation; however the pumps also appear to be in poor condition with visible signs of corrosion.

Existing Steam Condensate Receiver (left) and Boiler Feed Pumps (right)

There is a steam condensate return duplex pumpset unit located under the stairs in the Boiler room that lead to the adjacent Mechanical room. The condensate receiver was manufactured by Skidmore. The unit appears to be in poor condition with visible signs of corrosion.

Existing Duplex Condensate Receiver

Hot water is distributed from hot water converters to terminal heating equipment located throughout the building by four (4) end suction base mounted pumps. The pumps were manufactured by Weinman. The pumps appear to have been installed in 1976, with some pump and motor repairs occurring after the original installation. In general, the pumps are in poor condition and beyond their expected service life.

The pumps are constant flow and are not equipped with variable speed drives. The pumps have estimated capacities as follows based on design drawings and field observations:

- P-1 – 76 GPM, 5 HP serving HW Fin Tube Radiation heating
- P-2 – 48 GPM, 3 HP serving Hot Water Heating/Reheat Coils
- P-3 & P-4 (P-3A) – 7.5 HP HP Primary/Standby pumps serving Classroom UV's & AHUs

Existing Hot Water Pumps

There is an insulated hot water expansion tank suspended from the ceiling. The expansion tank appears to have been installed circa 1976.

Existing Expansion Tank

Some of the building areas were previously air conditioned by a steam fired absorption chiller plant (which is described in following sections of report). There is a base mounted end suction chilled water pump located across from the hot water pumps in the Mechanical room. This chilled water pump has been abandoned in place. The chilled water pumps previously supplied chilled water to a 2-pipe change-over piping distribution system that served the unit ventilator and air handling equipment cooling coils. The pump has an approximate capacity of 253 GPM, 10 HP based on 1976 design drawings. There are manual change-over valves and chilled water distribution piping that was previously used to divert chilled water to a two-pipe dual temperature loop. Only the hot water piping loop is currently used for hot water heating.

Existing Chilled Water Pump (left) and Change-over Valves (right)

In general, the majority of the piping distribution system and associated valving appears to be have been installed circa 1976, with some piping from the 1953 building being re-used at that time. In general the steam, condensate, hot water and chilled water piping appears to be in fair to poor condition, with the hot water and chilled water piping appearing to be in better condition than the existing steam and condensate piping. Piping insulation also appears to range from fair to poor condition. Some sections of piping are un-insulated, and insulation at fittings within the Mechanical room has been removed in some sections of piping (likely as part of an abatement project).

The Boiler room is provided with exhaust air ventilation from an inline exhaust fan (EF-6 – approx. 8,000 CFM per design drawings). The exhaust fan was installed circa 1976 and appears to be in poor to fair condition. There is also a combustion air ductwork distribution system that serves the Boiler room.

Automatic Temperature Controls:

The building HVAC automatic temperature control system is a combination pneumatic and direct digital control (DDC) system. The DDC system appears to be a "first generation" DDC system that was manufactured by Andover Controls.

There are four (4) pneumatic air compressors. It is our understanding that the largest air compressor is not functional, and new air compressors have been installed as required to maintain adequate air pressure in the pneumatic air tubing.

Existing ATC System Pneumatic Compressors

Existing ATC DDC Control Panels

Cooling Plant (Abandoned):

There is an existing, abandoned steam absorption chiller plant located in a Mechanical room located adjacent to the parking garage. The chiller was installed in 1976, was manufactured by Trane (ModelC3F-3 S/N L5A5861) and has a capacity of approximately 325 tons.

The steam absorption chiller was decommissioned several years ago and all of the chiller's lithium bromide solution was removed and disposed in 2010.

On the mezzanine level in the Mechanical room there are chilled water and condenser water pumps located next to the emergency generator. The pumps (P-4 & P-5) were manufactured by Weinman, appear to have been installed in 1976, and have a capacity of 270 GPM, 7.5 HP and 1300 GPM, 20 HP respectively.

There is a steam condensate return pump that previously served the steam condensate return from the chiller. The condensate pump appears to still be in service for the parking garage steam heating equipment.

Existing Absorption Chiller (left) and Chilled Water, Condenser Water Pumps (right)

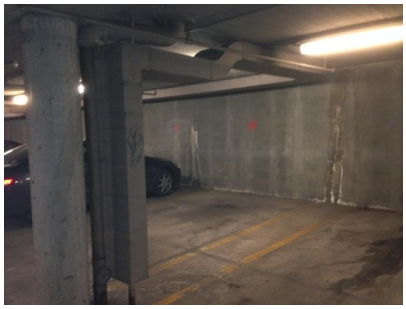
Existing Steam Condensate Pump

Parking Garage Heating and Ventilation:

The parking garage is heated by a steam make-up air heating coil and two steam ceiling suspended cabinet unit heaters. The adjacent stairwells are heated by steam cabinet unit heaters.

Exhaust air is provided by an exhaust air fan that is connected to sheetmetal exhaust ductwork routed through the parking garage at ceiling level. Low exhaust branch ducts and grilles are routed down columns. In some cases the original installed low exhaust grilles are still installed; however in most cases the low exhaust ducts and grilles have been damaged or cut and removed (likely due to previously being damaged).

There does not appear to be a functioning gas monitoring system installed. The existing exhaust and make-up air ventilation system does not appear to be working effectively as there is generally a strong odor of vehicle exhaust in the garage at times.



Existing Garage Exhaust Duct (left) and Steam Make-Up Air Heater (right)

Existing Damaged Garage Exhaust Ductwork and Grilles

The fire protection water service room is heated by two (2) ceiling suspended horizontal electric unit heaters. The unit heaters appear to be in good condition.

The electric room transformer vault is heated and ventilated based on our review of 1976 design drawings. During our site visit we were unable to observe these systems as the room was locked, and is only accessible by the Utility Company, NStar.

Penthouse Mechanical Room and Rooftop Equipment and Systems:

There is a cooling tower located on the roof adjacent to the mechanical penthouse equipment room. The cooling tower was installed circa 1976, is approximately 38 years old and appears to be in poor condition with visible signs of corrosion. The cooling tower has a capacity of approximately 325 tons. The unit is no longer in operation since the chiller was decommissioned.

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Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 9/February 18, 2014

Existing Cooling Tower

There are two (2) large central station air conditioning air handling units located in the Penthouse Mechanical room. The units are equipped with steam heating coils and chilled water cooling coils. The units currently only provide heating and ventilation to the building areas. The units were manufactured by Trane (Climate Changer Model), and were installed circa 1976 along with the associated ductwork and piping. The units appear to be in poor physical condition and have exceeded their estimated useful service life. The units have estimated capacity as follows based on design drawings: AC-1 = 20,360 CFM & AC-2 = 15,625 CFM. Each unit also has an associated base mounted centrifugal utility set return fan (RA-1 = 17090 CFM & RA-2 = 15265 CFM (per design drawings). The return fans were also installed circa 1976, and have exceeded their expected service life.

Existing Air Handling Unit (left) and Return Air Fan (right)

Existing Exhaust Ductwork and Louver Plenum (left) and Existing Exhaust Fans (right)

Existing Roof Exhaust Fan (left) and Existing Mechanical Room Exhaust Fan (right)

There are (4) four base mounted centrifugal exhaust air fans located within the Penthouse Mechanical room. The exhaust fans appear to be originally installed equipment and have exceeded there expected useful service life. The fans were installed circa 1976, and have capacities as follows per design drawings:

- EF-2 – 3,590 CFM (Toilet Exhaust)
- EF-3 - 600 CFM (Dishwasher Exhaust)
- EF-4 – 6,000 CFM (Kitchen Exhaust Fan)
- EF-5 – 11,625 CFM (Unit ventilator classroom exhaust)

There are inline exhaust air fans that serve the Mechanical room.

The exhaust fans are ducted to a common exhaust air plenum. Per current code, the kitchen exhaust fan should be ducted separately to the outdoors. The dishwasher exhaust fan no longer serves the dishwasher as the dishwasher has been converted to a teaching work room.

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Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 11/February 18, 2014

There are several roof mounted exhaust air fans. Four of the exhaust air fans appear to have been installed circa 1976 (RF-1 =410 CFM, RF-2=900 CFM, RF-3 = 300 CFM & RF-4=4,000 CFM per design drawings). The exhaust fans appear to be originally installed equipment and have exceeded there expected useful service life.

The air handling and fan equipment located in the Penthouse Mechanical room appears to be controlled by a combination pneumatic and direct digital control system, as manufactured by Andover Controls. As previously noted, the DDC system appears to be a "first generation" DDC control system.

There are several roof mounted air-cooled condensing units located on the roof of the building that are connected to ductless split system AC units located throughout the building. In general these units appear to have been installed within the past 5-10 years and in general the majority of units appear to be in good condition. There was one older condensing unit observed that appeared to be of an older vintage and in need of replacement.

Existing ATC Control Panels (Penthouse) and Existing Generator Vent and Intake Air Roof Vent (right)

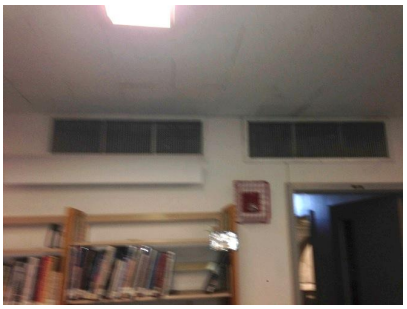
Existing Air Cooled Condensing Unit (left) and Existing DCU Air Cooled Condensing Units (right)

Library/Media Center:

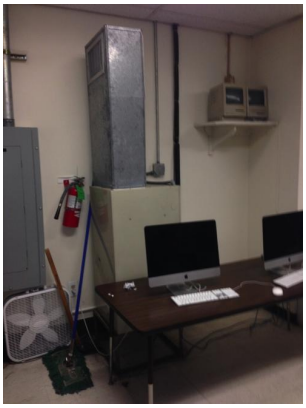
The Library/Media Center is heated and ventilated by an indoor air handling unit that delivers tempered air to the space via a galvanized sheetmetal distribution system to ceiling mounted diffusers. There are also zone duct mounted hot water heating coils in the supply ductwork. The majority of return air is removed from the space by two large sidewall return registers. The ductwork distribution system was installed circa 1976, and is approximately 38 years old and past its expected service life.

The Library/Media Center is also heated by supplemental fin tube radiation that is located along the perimeter exterior walls.

The Computer Room adjacent to the Library/Media Center is air conditioned by a vertical up flow air handling unit with split system DX (direct expansion) R-22 cooling coil that is connected to a roof mounted air cooled condensing unit. The system was manufactured by Carrier and appears to be in fair condition. The unit is floor mounted and is located within the Computer room.



Library Ceiling Supply Diffuser (left) and Library Sidewall Return Registers (right)



Library Fin Tube Radiation (left) and Computer Room AC Air Handling Unit (right)

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Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 13/February 18, 2014

Assembly Hall/Stage:

The Auditorium/Stage area is heated and ventilated by an indoor air handling unit that delivers tempered air to the space via a galvanized sheetmetal distribution system to ceiling mounted diffusers. There are also zone duct mounted hot water heating coils in the ductwork. Return air is primarily removed from the space by return registers located under the stage. The ductwork distribution system was installed circa 1976, and is approximately 38 years old and past its expected service life.

The Assembly Hall is also heated by supplemental fin tube radiation that is located along the perimeter exterior walls.

The Assembly Hall/Stage area is partially air conditioned by wall mounted ductless AC units that are connected to a roof mounted air-cooled condensing units. The systems were manufactured by Sanyo and appear to be in fair condition.

Existing Ductless AC Units

Existing Sidewall Register

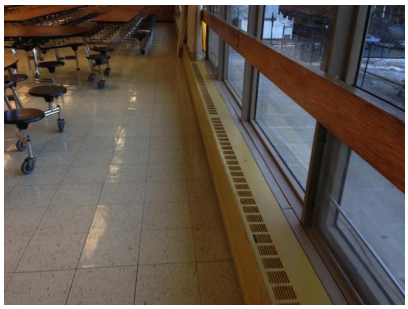
Cafeteria:

The Cafeteria is heated and ventilated by a combination of two (2) ceiling mounted horizontal unit ventilators installed at perimeter exterior areas of the Cafeteria and an indoor air handling unit that delivers tempered air to the space via a galvanized sheetmetal distribution system to ceiling mounted diffusers located in the interior areas of the Cafeteria. There are also zone duct mounted hot water heating coils in the supply ductwork. The Unit Ventilators and ductwork distribution system were installed circa 1976, and is approximately 38 years old and past its expected service life.

The Cafeteria is also heated by supplemental fin tube radiation that is located along the perimeter exterior wall.

The Faculty Dining area is heated and ventilated by a classroom unit ventilator and by the central indoor heating and ventilation unit system.

Ceiling Horizontal Unit Ventilator (left) and Unit Ventilator Louver at Overhang (right)



Cafeteria Fin Tube Radiation (left) and Transfer Grille (right)

The Kitchen has a stainless steel exhaust hood that is exhausted by a centrifugal utility set exhaust fan located in the Penthouse Mechanical room. The exhaust fan and ductwork do not appear to meet all current NFPA 96 code requirements. The Kitchen is heated by supplemental wall mounted fin tube radiation heating and supply air registers served by the central heating and ventilation air handling unit.

Kitchen Exhaust Hood (left) and Fin Tue Radiation Heating (right)

The Kitchen service corridor is exhausted by a sidewall propeller fan, which is used to remove heat generated by the refrigerator/freezer condensing units that are located in the service corridor. The Servery area has a large stand mounted propeller fan installed to help cool the area due to high temperatures from cooking operations.

Kitchen Service Corridor - Wall Propeller Fan (left) and Servery Area - Propeller Fan Stand (right)

Gymnasium:

The Gymnasium is heated and ventilated by a two indoor steam heating and ventilation units. One unit is located on a mezzanine level in the Boiler room and the other unit is located in ta fan room located adjacent to the Library. Both units appear to have been installed circa 1953 and are in poor physical condition and have exceeded their expected service life. The units have an approximate capacity of 3,000 CFM each based upon review of 1953 existing H&V design drawings. Exhaust air is removed from the gymnasium low wall exhaust grilles that are connected to an exhaust air fan located in the fan room adjacent to the Library.

Gym Heating & Ventilation Unit (in Boiler Room) (left) & Gym Exhaust Fan (left)

Gym Exhaust Grille

Auxiliary Gymnasium:

The Auxiliary Gymnasium is heated by a combination of a ceiling suspended unit ventilator, steam fin tube radiation and a steam unit heater. It appears that the unit ventilator and fin tube radiation heating are originally installed equipment circa 1953 and that the steam unit heater was installed in subsequent years, likely as a result of under-performing steam heating equipment operation. There is also a low wall exhaust air grille located in the auxiliary gymnasium. The heating and ventilation systems appear to be in poor condition and past their expected service life.

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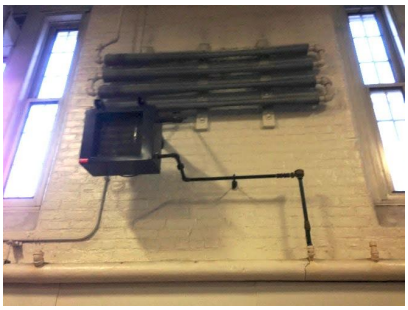
Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 17/February 18, 2014



Wall Mounted Fin Tube Radiation and Unit Heater

Unit Ventilator (left) and Exhaust Grille (right)

Administration:

The Administration offices are heated and ventilated by a combination of wall mounted classroom unit ventilator, fin tube radiation and heating and ventilation ceiling diffusers that are served by the central indoor heating and ventilation unit. There is also a zone duct mounted hot water heating coil in the supply ductwork. Exhaust air is removed by ceiling exhaust resisters that are connected to the central exhaust air fan system. The systems were installed circa 1976, and are approximately 38 years old and past its expected service life.

One of the offices had an electric heater installed.

Thermostat (left) and Electric Heater (right)

Ceiling Supply Diffuser and Exhaust Register (left) and Unit Ventilator (right)

Classrooms:

The majority of classrooms are heated and ventilated by vertical type classroom unit ventilators installed at the perimeter exterior walls of classrooms. There are some classrooms, typically located in interior locations that are heated and ventilated by the central heating and ventilation unit or ceiling mounted horizontal type classroom unit ventilators. Classrooms are typically exhausted by exhaust air fan systems. The Unit Ventilators and ductwork distribution systems appear to be originally installed equipment, installed circa 1953 or 1976, dependent upon location of classrooms, and are approximately 61 or 38 years old respectively and past their expected service life. Some classrooms also have supplemental hot water fin tube radiation installed; the fin tube radiation also appear to be originally installed equipment.

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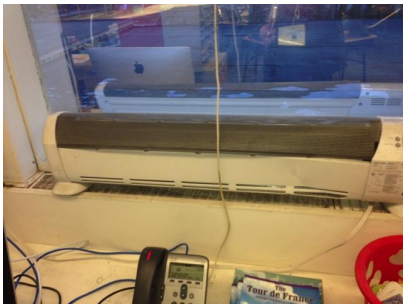
Devotion School
HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 19/February 18, 2014

Typical Classroom Unit Ventilator

Several classrooms are air conditioned by wall mounted or ceiling suspended ductless AC split system units that are connected to outdoor roof mounted air-cooled condensing units. The AC systems generally appear to be in fair condition.

Heating and Ventilation Grille (left) and Ductless AC Unit (right)



Electric Heater (left) and Baseboard Fin Tube Radiation (right)

Classroom Thermostat and Thermometer (left) and Thermostat (right)

Art Classroom:

The Art Classroom is heated and ventilated by a Classroom Unit Ventilator. The Unit Ventilator is in poor condition and is originally installed equipment and beyond its expected service life.

The Kiln is exhaust by a small kiln exhaust air fan system. The kiln does not have a canopy hood exhaust.

The Art Classroom is air conditioned partially by a window AC unit that appears to be in poor condition.

Kiln w/ Exhaust Kit

Art Classroom Unit Ventilator

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HVAC Existing Conditions Systems Report
J#831 037 00.00
L#43225/Page 21/February 18, 2014

Window AC Unit

Entryways, Stairwells, and Corridors:

Entryways, stairwells, and corridors are typically heated by cabinet unit heaters. There are also locations where hot water fin tube radiation is installed. In general, the heating equipment is originally installed equipment, approximately 38 years old or greater and past its expected service life.

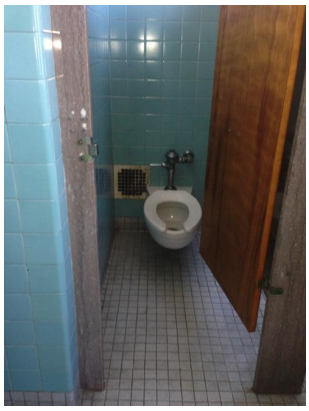
Existing Cabinet Unit Heater

Existing Cabinet Unit Heater

Existing Fin Tube Radiation at Stairwell

Restrooms:

The majority of restrooms are exhausted by via a galvanized sheetmetal distribution system, typically through sidewall exhaust air grilles to roof mounted exhaust air fans or penthouse centrifugal utility fan exhaust systems, dependent on the location of the restroom. The exhaust air systems appear to be originally installed systems, circa 1953 or 1976, dependent upon location. The exhaust air systems have exceeded their expected service life.



Existing Bathroom Exhaust Grille

Existing Bathroom Exhaust Grille

Custodial Closets:

Some of the custodial closets observed did not appear to be exhausted.

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Devotion School
Brookline, MA
Electrical Existing Conditions Systems Report
J#831 037 00.00
L#43211/Page 1/February 18, 2014

ELECTRICAL

Executive Summary

In general, the electrical systems have reached their life expectancy and are in poor condition. Life safety lighting and exit signs are fed from the generator and are not compliant with today's codes.

The fire alarm system is in fair condition and will require replacement due to voice evacuation requirements of present code.

Lighting systems in general have been upgraded with lamps and ballasts to conserve energy. T8 lamps have been installed in most spaces. Light fixtures however are in poor/fair condition in the majority of the building. The fixtures are original to respective addition construction period in most locations and should be upgraded.

The power for the facility is in poor condition, a new power distribution system should be provided.

The communications system wiring infrastructure for tel/data has been upgraded to accommodate desired use but is not up to present standards. A classroom intercom/paging system has been upgraded but is not up to present standards. The central clock system is not operational. There is a dedicated headend room and remote IDF closets with a fiber optic back bone that is in fair condition.

Electrical Distribution System

The service voltage is 120/208V rated at 3000 amps. The switch is in poor condition and beyond its useful life. The motor control center in the Boiler Room is in poor condition.

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There is a dedicated NSTAR transformer vault for the facility. The vault was locked for restricted access. The vault is accessed through the parking garage.

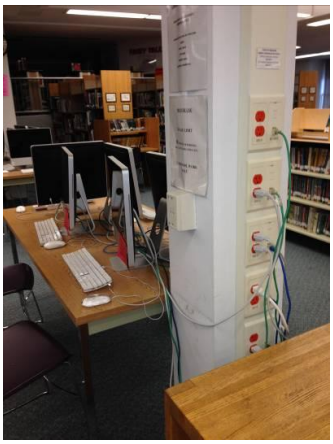
The vault is accessed through the parking garage.

There are sub-panels located throughout the facility and they are generally in corridors or closets and are circuit breaker type and are in poor condition where original to respective addition. Panels have been added within the last 10 years and are in fair condition.

Branch Circuits/Wiring Devices

This quantity of receptacles appears minimal in most spaces. Additional receptacles for computers have been added in classrooms typically done using surface wiremold.

Kitchen receptacles are not on GFCI circuits to meet present code.



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Devotion School
Brookline, MA
Electrical Existing Conditions Systems Report
J#831 037 00.00
L#43211/Page 3/February 18, 2014

Interior Lighting System

Lighting in corridor varies but is generally recessed 2'x2' acrylic fluorescent fixtures. The T8 lamps and energy saving ballasts have been retrofitted into existing fixtures.

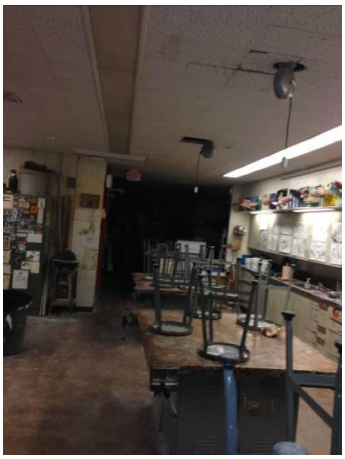
Classroom lighting typically consists of 1'x4' blade fixtures. The lighting system should be upgraded in all classrooms. The fixtures have gone through a T8 lamp and ballast upgrade. The fixtures are controlled by occupancy sensors.

Lighting in mechanical spaces consists of fluorescent industrial fixtures.

Cafeteria lighting consists of wraparound fluorescent fixtures.

Kitchen lighting consists of 2'x4' surface fluorescent fixtures. The fixtures have lenses and are in fair condition.

Continuous recessed fluorescent fixtures are present in Arts Classroom.



Lighting in auditorium is recessed incandescent downlighting around perimeter and fluorescent linear fixtures for house lighting.

Garage lighting consists of fluorescent surface fixtures.

Theatrical spot lights are in poor condition. The system should be upgraded with new border lights and dimmer racks.

Gym lighting consists of high bay fluorescent fixtures. The fixtures were replaced approximately 5 years ago. The fixtures are equipped with T8 lamps.

Media center lighting typically consists of recessed fluorescent troffers and linear fluorescent fixtures. The fixtures have gone through a T8 lamp and ballast upgrade.

Emergency Lighting System

The emergency lighting system throughout the facility is fed via the emergency generator. There is no separation of life safety and optional standby loads. The emergency generator is located near the electrical room. The generator is well beyond its useful life. It should be replaced. The generator appears to be 200kW and is manufactured by Empire. The rating tag was painted.

Exit signs are illuminated as required by code.

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Devotion School
Brookline, MA
Electrical Existing Conditions Systems Report
J#831 037 00.00
L#43211/Page 5/February 18, 2014

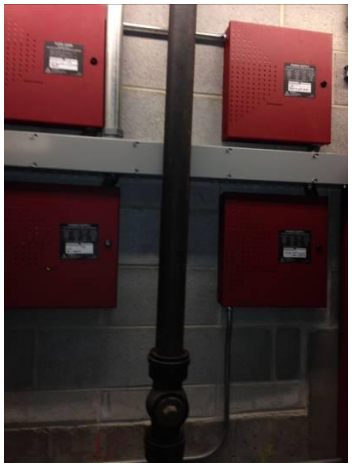
Emergency lighting is normally "off". There were no area protection relays observed.

Site Lighting System

The lighting at the site consists of building mounted flood lighting around perimeter. The site lighting system should be upgraded with dark sky compliant lighting.

Fire Alarm System

The fire alarm panel is manufactured by Notifier with 29 zones. The system is conventional type. The fire alarm notification alarms are not code compliant in accordance with present code. There are door holders in corridors as required by code.



Field power supplies have been installed for horn/strobe coverage throughout the facility.

There is smoke detection throughout the school including Media Center.

The fire alarm annunciator is located in the main vestibule.

Data/Telephone/Classroom Intercom/Clock System/Security System

The master clock system is operational but beyond its life expectancy. Classroom clocks have been replaced with battery type where system clocks have failed.

There is a local sound system in Auditorium.

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Devotion School
Brookline, MA
Electrical Existing Conditions Systems Report
J#831 037 00.00
L#43211/Page 7/February 18, 2014

In the classrooms there are two data drops for teacher computers. All data wiring is CAT 5. The voice/data infrastructure should be updated to present standards. The CAT 5 is installed in Wiremold. The location of data outlets appears fine.

There are dedicated data closets. There is a wall mounted patch panel in one classroom.

There is a Cisco wireless data network presently being installed throughout the facility.

The classroom intercom system is manufactured by Rauland.

There are paging speakers throughout the facility connected through the Rauland intercom system.

A closed circuit TV system is present. The coverage in the building covers corridors and entrance locations and cafeteria.

The telephone system has been upgraded to Voice-Over-IP manufactured by Cisco.

Appendix H

Hazardous Materials

Hazardous Materials Survey 185

PBC Report 205

REPORT
FOR
HAZARDOUS MATERIALS DETERMINATION
SURVEY
AT THE
EDWARD DEVOTION SCHOOL
BROOKLINE, MASSACHUSETTS

PROJECT NO: 213 201.00

Survey Dates:
August 8-30, 2013

CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS

UEC universal environmental consultants

September 9, 2013

Mr. Tony Guigli
Town of Brookline
Building Department
333 Washington Street, 3rd floor
Brookline, MA 02445

Reference: Report for Hazardous Materials Determination Survey
Edward Devotion School, Brookline, MA

Dear Mr. Guigli:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for hazardous materials determination survey at the Edward Devotion School, Brookline, MA.

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

Ammar M. Dieb
President

UEC:\213 201\REPORT.DOC

Cc: Mr. Pip Lewis, HMFH Architect

Enclosure

1.0 INTRODUCTION:

UEC has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including residential, commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of twenty years of experience.

As part of the proposed renovation and demolition project, UEC was contracted by the Town of Brookline to conduct the following determination services at the Edward Devotion School, Brookline, MA:

- Asbestos Containing Materials (ACM) Inspection and Sampling;
- Lead Based Paint (LBP) Determination Inspection;
- Polychlorinated Biphenyls (PCB's)-Electrical Equipment and Light Fixtures Assessment;

The building consists of three construction dates 1924, 1952 and 1976. A crawl space exists under the 1952 building. Two underground oil tanks were observed.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation. Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with the Environmental Protection Agency (EPA) standard.

Bulk samples were collected by an EPA accredited and a Massachusetts licensed asbestos inspector Mr. Leonard J. Busa (AI-030673) and analyzed by Massachusetts licensed laboratory Asbestos Identification Laboratory, Woburn, MA.

The scope of work also included a determination survey for LBP at various areas. The inspection was to assess the extent of LBP present and not an inspection for health, safety or hazard exposure to building occupants or to develop abatement or management documents. The inspection for LBP was a determination inspection with only representative sampling using an RMD X-Ray Fluorescence (XRF) analyzer, serial number LPA 1032. The inspector has successfully completed the manufacturer's training requirements.

LBP survey performed was a lead paint determination of painted surfaces and did not include the evaluations of lead in dust, soil, and water. No paint chip sampling by Atomic Absorption Spectrophotometry (AAS) was included in the scope of work. The survey was not a Comprehensive Lead Inspection or Independent Clearance Inspection and will not result in a Certificate of Lead-Safe Status or Certificate of Conformance. LBP survey and testing was conducted by a licensed Massachusetts Master Lead Inspector Brenda Eastman (I3691).

Samples results, logs and floor plans are attached.

2.0 FINDINGS:

Asbestos Containing Materials:

The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed.

All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent in accordance with EPA regulations.
All suspect materials that contain any amount of asbestos must be considered asbestos if it is scheduled to be disturbed per the requirements of the Department of Environmental Protection (DEP) regulations. No additional suspect and

accessible ACM were found during this survey. However, hidden ACM may be found during renovation and demolition activities.

Number of Samples Collected

Two hundred ninety five (295) bulk samples were collected from the following suspect materials:

Samples 1-16: Exterior/Interior of school for Damproofing and Glue;
Samples 17-103: 1924 Building;
Samples 104-141: 1952 Building;
Samples 142-235: 1976 Building;
Samples 236-251: 1924 Building;
Samples 252-294: 1952 Building;
Sample 295: 1924 Building.

Sample Number, Type and Location of Material

1. Damproofing on foundation wall at front of building 1924
2. Damproofing on foundation wall at front of building 1924
3. Damproofing on backside of brick behind wall plaster at faculty room building 1924
4. Damproofing on backside of brick behind wall plaster at second floor building 1924
5. Damproofing on foundation wall by classroom 148 building 1952
6. Damproofing on foundation wall by classroom 143 building 1952
7. Damproofing on foundation wall by classroom 141 building 1952
8. Damproofing on foundation wall by classroom 139 building 1952
9. Flashing protruding from foundation wall by classroom 130 building 1952
10. Damproofing on backside of brick at stairwell by entrance to crawl space building 1952
11. Damproofing on backside of brick behind wall plaster at classroom 147 building 1952
12. Damproofing on foundation wall by classroom 111 building 1976
13. Damproofing on foundation wall by classroom 111 building 1976
14. Adhesive on Styrofoam board behind brick building 1976
15. Adhesive on Styrofoam board behind brick building 1976
16. Thick black paper on Styrofoam board behind brick building 1976

17. Hard joint insulation at room 129
18. Off white vinyl floor tile at gymnasium storage room
19. Black mastic for off white vinyl floor tile at gymnasium storage room
20. Hard thick leveler under off white vinyl floor tile at gymnasium storage room
21. Thin soft grey leveler under carpet on plywood at main corridor
22. Thin soft grey leveler under carpet on cement at auditorium
23. Carpet glue on cement at auditorium
24. Cement floor at auditorium
25. Off white vinyl floor tile on plywood at storage room by room 327-B
26. Mastic for off white vinyl floor tile on plywood at storage room by room 327-B
27. Off white vinyl floor tile at room 129
28. Mastic for off white vinyl floor tile at room 129
29. New chocolate vinyl floor tile at nurse office
30. New brown vinyl floor tile at nurse office
31. Newer white/grey vinyl floor tile on plywood at library computer room
32. Mastic for newer white/grey vinyl floor tile on plywood at library computer room
33. Unknown vinyl floor tile under carpet at classroom 131 A-B
34. Mastic for unknown vinyl floor tile under carpet at classroom 131 A-B
35. Carpet glue at classroom 131 A-B
36. Black mastic on cement floor under carpet at classroom 135
37. Red linoleum floor covering on stairs at rear stairs down to main gymnasium
38. Adhesive for red linoleum floor covering on stairs at rear stairs down to main gymnasium

39. Terrazzo floor at stairwell by 132
40. Black paper under hardwood floor at main gymnasium
41. Paper/mastic under hardwood floor at main gymnasium
42. Paper/mastic under hardwood floor at main gymnasium
43. Paper/mastic under hardwood floor at main gymnasium
44. Paper/mastic under hardwood floor at main gymnasium
45. Paper/mastic under hardwood floor at main gymnasium
46. Soft grey glazing caulking for window in wood door at main gymnasium
47. Dark brown adhesive for vinyl baseboard at stairwell by library
48. Hard beige glazing caulking for window in metal door at bottom of stairs
49. Black glue in fiberglass ceiling batting insulation at room 228
50. Pink framing caulking on interior door at bottom of stairs
51. Paper backing for small round light fixture at room 132 bathroom
52. Mud around access hatch on old chimney at basement
53. Grey brick in old chimney at basement
54. White/grey brick in old chimney at basement
55. Beige brick in old chimney at basement
56. 1'x 1' Acoustical ceiling tile type I at third floor main corridor
57. 1'x 1' Acoustical ceiling tile type I at library
58. 1'x 1' Acoustical ceiling tile type II at room 127-D
59. 1'x 1' Acoustical ceiling tile type III above type I at second floor main corridor
60. Glue daub for 1'x 1' acoustical ceiling tile type III above type I at second floor main corridor
61. 1'x 1' Acoustical ceiling tile type III above type I at main corridor by room 327
62. Glue daub for 1'x 1' acoustical ceiling tile type III above type I at main corridor by room 327
63. Newer 2'x 4' suspended acoustical ceiling tile at first floor main corridor
64. Ceiling plaster at third floor main corridor above ceiling tile
65. Ceiling plaster at room 129
66. Ceiling plaster debris on floor at first floor main corridor
67. Rough ceiling plaster at hall to music room
68. Ceiling plaster at hall outside main gymnasium
69. Wall plaster at room 228
70. Wall plaster at library
71. Wall plaster at room 129
72. Wall plaster at stairwell by room 301
73. Ceiling plaster at auxiliary gymnasium storage 031-A
74. Soft ceiling plaster at janitor closet by room 335
75. Gypsum wall at storage room by room 327
76. Rough coating on gypsum wall at storage room by room 327
77. Rough coating on gypsum wall above ceiling at room 328
78. Gypsum wall at room 328
79. Skim coat joint compound at room 328
80. Fireproofing at second floor main corridor
81. Ceiling plaster at boiler room
82. Plaster soffit over boiler #2 at boiler room
83. Plaster soffit over boiler #2 at boiler room
84. Hard joint insulation at boiler room
85. Duct insulation for boiler #1 at boiler room
86. Duct insulation for boiler #2 at boiler room
87. Breeching insulation at rear of boiler #2 at boiler room
88. Tank insulation at boiler room
89. White sealant on fiberglass insulated pipe at boiler room
90. Mud on ribs of metal jacketed boiler #2 at boiler room
91. Mud on ribs of metal jacketed boiler #2 at boiler room
92. Mud over mud drum of metal jacketed boiler #2 at boiler room
93. Insulation at front of original tank at boiler room
94. Black/beige residue on original tank at boiler room

95. Mud in seams of original tank at boiler room
96. Exterior framing caulking on old door at main entrance
97. Exterior framing caulking on window at front of school
98. Exterior framing caulking on window at rear of school
99. Unit vent grille caulking
100. Exterior decorative block at front of school
101. Exterior grey caulking around raised portion of decorative block at front of school
102. Exterior vertical grey caulking where buildings 1924 and 1952 meet
103. Exterior black patching between brick wall/cement where buildings 1924 and 1952 meet

104. 9”x 9” Vinyl floor tile at room 336 storage
105. Mastic for 9”x 9” vinyl floor tile at room 336 storage
106. Brown leveler for 9”x 9” vinyl floor tile at room 336 storage
107. Brown leveler under carpet at room 339
108. Carpet glue at room 339
109. Mastic for 9”x 9” vinyl floor tile under carpet at second floor main corridor
110. Brown leveler for 9”x 9” vinyl floor tile under carpet at second floor main corridor
111. Mastic for 9”x 9” vinyl floor tile under linoleum at room 236
112. Brown leveler under carpet at room 140
113. Black mastic on brown leveler under carpet at room 140
114. Hard red leveler at perimeter of room 140
115. Grey leveler under carpet at room 143
116. Grey leveler under carpet at main corridor by room 237
117. Old linoleum floor covering at room 236
118. Brown adhesive for old linoleum floor covering at room 236
119. Insulation inside wood fire door at closet door 137
120. Black damproofing for sink at room 141
121. Wall plaster at classroom 147
122. Adhesive on wall plaster at classroom 147
123. Skim coat on wall plaster at classroom 147
124. Rough ceiling plaster at stairwell by classroom 138
125. Rough ceiling plaster above 1’x 1’ acoustical ceiling tile at main corridor by room 139
126. Wall plaster at classroom 139
127. Painted gypsum ceiling above 1’x 1’ acoustical ceiling tile at room 143
128. Skim coat on painted gypsum ceiling above 1’x 1’ acoustical ceiling tile at room 143
129. Painted gypsum ceiling at room 243
130. 1’x 1’ Acoustical ceiling tile type I at room 143
131. Glue daub for 1’x 1’ acoustical ceiling tile type II above type I at room 336
132. Glue daub for 1’x 1’ acoustical ceiling tile type II above type I at room 140
133. Glue daub for 1’x 1’ acoustical ceiling tile type II above type I at room 143
134. Acoustical ceiling tile type II on type I at room 143
135. Exterior original framing caulking under window sill
136. Exterior hard grey glazing caulking on window
137. Exterior hard grey glazing caulking on window
138. Exterior thick glazing caulking on window
139. Exterior off white newer framing caulking on window
140. Exterior pink unit vent grille framing caulking
141. Exterior unit vent grille framing caulking

142. Hard joint insulation at custodian room by room 113
143. Hard joint insulation at garage
144. 1’x 1’ Acoustical ceiling tile type I at room 210
145. 1’x 1’ Acoustical ceiling tile type I at lobby
146. 2’x 4’ Suspended acoustical ceiling tile at gymnasium lobby
147. 2’x 4’ Suspended acoustical ceiling tile at kitchen
148. 2’x 4’ Suspended acoustical ceiling tile at hall by room 109

149. Wall joint compound at room 207
150. Wall joint compound at room 314
151. Wall joint compound at room 325
152. Hard plaster at café entrance
153. Wall plaster on joint compound at hall outside room 202
154. Cementitious beige/grey material on beam at third floor hall by room 324
155. Wall joint compound at room 214
156. Vinyl baseboard at room 214
157. Adhesive for vinyl baseboard at room 214
158. Fireproofing at hall by room 324
159. Fireproofing at hall by room 109
160. Fireproofing at hall by café lobby
161. Fireproofing at room 111-A
162. Fireproofing at hall by room 206
163. Pink framing caulking for interior door at girl's room by room 114
164. Pink framing caulking for interior door at gym lobby ramp down to garage
165. Vertical pink caulking in brick at café
166. Vertical pink caulking in brick at center stairwell
167. Glazing caulking for window in wood door at rooms 309/310
168. Glazing caulking for window in wood door at main hall double door assembly
169. Interior window glazing caulking at room 207
170. Interior window glazing caulking at room 311
171. Red sealant in seams of duct at area 305
172. Adhesive for slate window sill at café lobby
173. Adhesive for slate window sill at room 310
174. Adhesive for slate window sill at room 206
175. Hard joint insulation in pipe chase at first floor boy's room
176. Pink framing caulking on interior door at entrance to generator room
177. Glue tab for fiberglass insulated chiller unit at generator room
178. Muffler exhaust of generator at generator room
179. Generator exhaust header at generator room
180. Hard joint insulation at generator room
181. Mud on flange at generator room
182. Cement ceiling at garage
183. Coating on fiberglass ceiling tile at kitchen
184. Canvas gasket on metal duct above ceiling at kitchen
185. Grey damproofing for sink at room 214
186. Transite table at room 212
187. Vertical brown expansion joint in brick at custodian room by room 113
188. Exposed tack board adhesive at hall outside room 202
189. Partition wall at room 303
190. Fabric covering on partition wall at room 303
191. Horizontal brown expansion joint board between wall and floor at garage
192. Hard brown expansion joint board in concrete of foundation wall at garage
193. Black glue in hard brown expansion joint board in concrete of foundation wall at garage
194. Off white 12"x 12" vinyl floor tile at room 224-A
195. Mastic for off white 12"x 12" vinyl floor tile at room 224-A
196. Off white 12"x 12" vinyl floor tile at room 113
197. Mastic for off white 12"x 12" vinyl floor tile at room 113
198. Carpet glue on mastic for off white 12"x 12" vinyl floor tile at room 113
199. Off white 12"x 12" vinyl floor tile at janitor room by room 109
200. Mastic for off white 12"x 12" vinyl floor tile at janitor room by room 109
201. Unknown vinyl floor tile under carpet at room 210
202. Carpet glue at room 210
203. Grey/red/blue 12"x 12" vinyl floor tile at stairwell by room 212
204. Mastic for grey/red/blue 12"x 12" vinyl floor tile at stairwell by room 212

205. Grey/red/blue 12”x 12” vinyl floor tile at first floor hall by elevator
206. Mastic for grey/red/blue 12”x 12” vinyl floor tile at first floor hall by elevator
207. Black mastic on cement floor under rubber matting at gymnasium lobby
208. Light brown mastic for vinyl base board at lobby stairwell
209. Carpet glue at room 306
210. Carpet glue at room 203
211. New blue linoleum floor covering at room 111
212. New blue/grey vinyl floor tile at garage stairwell up to café
213. Mastic for blue/grey vinyl floor tile at garage stairwell up to café
214. New light colored vinyl floor tile under carpet at room 208
215. Duct insulation at penthouse
216. Duct insulation at penthouse
217. Hard joint insulation at penthouse
218. Mud on flange at penthouse
219. Fireproofing at stairs up to penthouse
220. Red sealant on duct at penthouse
221. Grey sealant on duct at penthouse
222. Grey sealant on duct at penthouse
223. Assumed roofing product seen behind exterior metal wall at penthouse
224. Interior hard grey glazing caulking for exterior window at café lobby
225. Interior soft grey glazing caulking for exterior window at café lobby
226. Grey framing caulking between cement covered walkway and window at café lobby
227. Horizontal white caulking in cement covered walkway at café lobby
228. Interior grey glazing caulking for exterior window at room 206
229. Vertical brown caulking within metal window framing system at café lobby
230. Pink door framing caulking
231. Pink unit vent grille caulking
232. Pink window framing caulking at café lobby
233. Vertical pink caulking in brick
234. Beige brick
235. Vertical brown expansion joint board between cement wall and brick

236. Paper under hardwood floor at library
237. Paper under hardwood floor at office 132-C
238. Wall joint compound at basement former locker room areas
239. Wall plaster at stairwell by room 131-C
240. Mud on flange at compressor room
241. Hard joint insulation at compressor room
242. Old pipe hanger mud at compressor room
243. Mud at air separator extension at compressor room
244. Hard joint insulation at compressor room
245. Valve mud fitting at compressor room
246. Ceiling plaster at compressor room
247. Fiberglass insulation on floor at attic
248. Wall plaster at attic
249. Assumed roofing debris on wood beams at attic
250. Transite siding on cooling unit on roof
251. Interior paper filtering system of cooling unit on roof

252. 1’x 1’ Acoustical ceiling tile type I at main corridor by room 140
253. Fancy ceiling trim at mechanical room 150
254. Wall joint compound at main corridor by room 142
255. Wall plaster at room 239
256. Wall plaster at room 139 closet
257. Wall plaster on gypsum at hall by room 150
258. Ceiling plaster at custodian room by room 151

259. Rough ceiling plaster at mechanical room 150
260. Hard red leveler on brown leveler at room 242
261. Top layer light grey leveler at main corridor by room 140
262. Bottom layer thick dark grey leveler at main corridor by room 140
263. Composite of grey/brown leveler and mastic at main corridor by room 140
264. Brown leveler under carpet at second floor main corridor by room 248
265. Mastic for brown leveler under carpet at second floor main corridor by room 248
266. Grey leveler under carpet at main corridor by room 143
267. Brown leveler under grey leveler carpet at main corridor by room 143
268. Thin grey leveler under carpet on cement at room 139
269. Green 9”x 9” vinyl floor tile at room 139 closet
270. Mastic for green 9”x 9” vinyl floor tile at room 139 closet
271. Brown leveler under green 9”x 9” vinyl floor tile at room 139 closet
272. Mastic for 9”x 9” vinyl floor tile under carpet at room 241
273. Carpet glue at room 241
274. Residue red leveler under carpet at room 141
275. Off white 12”x 12” vinyl floor tile at room 142
276. Mastic for off white 12”x 12” vinyl floor tile at room 142
277. Newer white/grey/green vinyl floor tile at room 138
278. Thick colors vinyl floor tile at custodian room by room 245
279. Various colored vinyl floor tile at stairwell by room 143
280. Mastic for various colored vinyl floor tile at stairwell by room 143
281. Old linoleum covering on heating cabinet at room 239
282. Grey damproofing on sink at room 139
283. Linoleum covering on heating cabinet at room 138
284. Molding for heating cabinet at room 139
285. Glue daub for 1’x 1; acoustical ceiling tile at room 339-A
286. Insulation inside wood fire door at room 141
287. Interior window glazing caulking at stairwell by room 143
288. Glazing caulking for window in metal door at stairwell by room 237
289. Original tack board at room 138
290. Adhesive for original tack board at room 138
291. Insulation inside wood fire door at mechanical room 150
292. Red sealant on duct at crawl space
293. Debris on cement floor at crawl space
294. New grey vinyl floor tile at room 147

295. Exterior old framing caulking under newer window

Sample Results

Sample Number, Type and Location of Material	Sample Result
1. Damproofing on foundation wall at front of building 1924	No Asbestos Detected
2. Damproofing on foundation wall at front of building 1924	5% Asbestos
3. Damproofing on backside of brick behind wall plaster at faculty room building 1924	No Asbestos Detected
4. Damproofing on backside of brick behind wall plaster at second floor building 1924	No Asbestos Detected
5. Damproofing on foundation wall by classroom 148 building 1952	10% Asbestos
6. Damproofing on foundation wall by classroom 143 building 1952	10% Asbestos
7. Damproofing on foundation wall by classroom 141 building 1952	5% Asbestos
8. Damproofing on foundation wall by classroom 139 building 1952	5% Asbestos
9. Flashing protruding from foundation wall by classroom 130 building 1952	No Asbestos Detected
10. Damproofing on backside of brick at stairwell by entrance to crawl space building 1952	10% Asbestos
11. Damproofing on backside of brick behind wall plaster at classroom 147 building 1952	10% Asbestos
12. Damproofing on foundation wall by classroom 111 building 1976	10% Asbestos
13. Damproofing on foundation wall by classroom 111 building 1976	10% Asbestos

14.	Adhesive on Styrofoam board behind brick building 1976	No Asbestos Detected
15.	Adhesive on Styrofoam board behind brick building 1976	No Asbestos Detected
16.	Thick black paper on Styrofoam board behind brick building 1976	No Asbestos Detected
17.	Hard joint insulation at room 129	No Asbestos Detected
18.	Off white vinyl floor tile at gymnasium storage room	2% Asbestos
19.	Black mastic for off white vinyl floor tile at gymnasium storage room	5% Asbestos
20.	Hard thick leveler under off white vinyl floor tile at gymnasium storage room	No Asbestos Detected
21.	Thin soft grey leveler under carpet on plywood at main corridor	No Asbestos Detected
22.	Thin soft grey leveler under carpet on cement at auditorium	No Asbestos Detected
23.	Carpet glue on cement at auditorium	No Asbestos Detected
24.	Cement floor at auditorium	No Asbestos Detected
25.	Off white vinyl floor tile on plywood at storage room by room 327-B	2% Asbestos
26.	Mastic for off white vinyl floor tile on plywood at storage room by room 327-B	5% Asbestos
27.	Off white vinyl floor tile at room 129	2% Asbestos
28.	Mastic for off white vinyl floor tile at room 129	5% Asbestos
29.	New chocolate vinyl floor tile at nurse office	No Asbestos Detected
30.	New brown vinyl floor tile at nurse office	No Asbestos Detected
31.	Newer white/grey vinyl floor tile on plywood at library computer room	No Asbestos Detected
32.	Mastic for newer white/grey vinyl floor tile on plywood at library computer room	5% Asbestos
33.	Unknown vinyl floor tile under carpet at classroom 131 A-B	No Asbestos Detected
34.	Mastic for unknown vinyl floor tile under carpet at classroom 131 A-B	No Asbestos Detected
35.	Carpet glue at classroom 131 A-B	No Asbestos Detected
36.	Black mastic on cement floor under carpet at classroom 135	No Asbestos Detected
37.	Red linoleum floor covering on stairs at rear stairs down to main gymnasium	No Asbestos Detected
38.	Adhesive for red linoleum floor covering on stairs at rear stairs down to main gymnasium	No Asbestos Detected
39.	Terrazzo floor at stairwell by 132	No Asbestos Detected
40.	Black paper under hardwood floor at main gymnasium	No Asbestos Detected
41.	Paper/mastic under hardwood floor at main gymnasium	No Asbestos Detected
42.	Paper/mastic under hardwood floor at main gymnasium	No Asbestos Detected
43.	Paper/mastic under hardwood floor at main gymnasium	No Asbestos Detected
44.	Paper/mastic under hardwood floor at main gymnasium	No Asbestos Detected
45.	Paper/mastic under hardwood floor at main gymnasium	No Asbestos Detected
46.	Soft grey glazing caulking for window in wood door at main gymnasium	No Asbestos Detected
47.	Dark brown adhesive for vinyl baseboard at stairwell by library	No Asbestos Detected
48.	Hard beige glazing caulking for window in metal door at bottom of stairs	No Asbestos Detected
49.	Black glue in fiberglass ceiling batting insulation at room 228	No Asbestos Detected
50.	Pink framing caulking on interior door at bottom of stairs	No Asbestos Detected
51.	Paper backing for small round light fixture at room 132 bathroom	60% Asbestos
52.	Mud around access hatch on old chimney at basement	No Asbestos Detected
53.	Grey brick in old chimney at basement	No Asbestos Detected
54.	White/grey brick in old chimney at basement	No Asbestos Detected
55.	Beige brick in old chimney at basement	No Asbestos Detected
56.	1'x 1' Acoustical ceiling tile type I at third floor main corridor	No Asbestos Detected
57.	1'x 1' Acoustical ceiling tile type I at library	No Asbestos Detected
58.	1'x 1' Acoustical ceiling tile type II at room 127-D	No Asbestos Detected
59.	1'x 1' Acoustical ceiling tile type III above type I at second floor main corridor	No Asbestos Detected
60.	Glue daub for 1'x 1' acoustical tile type III above type I at second floor main corridor	No Asbestos Detected
61.	1'x 1' Acoustical ceiling tile type III above type I at main corridor by room 327	No Asbestos Detected
62.	Glue daub for 1'x 1' acoustical tile type III above type I at main corridor by room 327	No Asbestos Detected
63.	Newer 2'x 4' suspended acoustical ceiling tile at first floor main corridor	No Asbestos Detected
64.	Ceiling plaster at third floor main corridor above ceiling tile	No Asbestos Detected
65.	Ceiling plaster at room 129	No Asbestos Detected
66.	Ceiling plaster debris on floor at first floor main corridor	No Asbestos Detected
67.	Rough ceiling plaster at hall to music room	No Asbestos Detected
68.	Ceiling plaster at hall outside main gymnasium	No Asbestos Detected

69.	Wall plaster at room 228	No Asbestos Detected
70.	Wall plaster at library	No Asbestos Detected
71.	Wall plaster at room 129	No Asbestos Detected
72.	Wall plaster at stairwell by room 301	No Asbestos Detected
73.	Ceiling plaster at auxiliary gymnasium storage 031-A	No Asbestos Detected
74.	Soft ceiling plaster at janitor closet by room 335	No Asbestos Detected
75.	Gypsum wall at storage room by room 327	No Asbestos Detected
76.	Rough coating on gypsum wall at storage room by room 327	No Asbestos Detected
77.	Rough coating on gypsum wall above ceiling at room 328	No Asbestos Detected
78.	Gypsum wall at room 328	No Asbestos Detected
79.	Skim coat joint compound at room 328	No Asbestos Detected
80.	Fireproofing at second floor main corridor	No Asbestos Detected
81.	Ceiling plaster at boiler room	No Asbestos Detected
82.	Plaster soffit over boiler #2 at boiler room	No Asbestos Detected
83.	Plaster soffit over boiler #2 at boiler room	No Asbestos Detected
84.	Hard joint insulation at boiler room	No Asbestos Detected
85.	Duct insulation for boiler #1 at boiler room	No Asbestos Detected
86.	Duct insulation for boiler #2 at boiler room	No Asbestos Detected
87.	Breeching insulation at rear of boiler #2 at boiler room	No Asbestos Detected
88.	Tank insulation at boiler room	No Asbestos Detected
89.	White sealant on fiberglass insulated pipe at boiler room	No Asbestos Detected
90.	Mud on ribs of metal jacketed boiler #2 at boiler room	No Asbestos Detected
91.	Mud on ribs of metal jacketed boiler #2 at boiler room	No Asbestos Detected
92.	Mud over mud drum of metal jacketed boiler #2 at boiler room	No Asbestos Detected
93.	Insulation at front of original tank at boiler room	No Asbestos Detected
94.	Black/beige residue on original tank at boiler room	No Asbestos Detected
95.	Mud in seams of original tank at boiler room	No Asbestos Detected
96.	Exterior framing caulking on old door at main entrance	3% Asbestos
97.	Exterior framing caulking on window at front of school	No Asbestos Detected
98.	Exterior framing caulking on window at rear of school	No Asbestos Detected
99.	Unit vent grille caulking	No Asbestos Detected
100.	Exterior decorative block at front of school	No Asbestos Detected
101.	Exterior grey caulking around raised portion of decorative block at front of school	No Asbestos Detected
102.	Exterior vertical grey caulking where buildings 1924 and 1952 meet	2% Asbestos
103.	Exterior black patching between brick wall/cement where buildings 1924 and 1952 meet	No Asbestos Detected
104.	9”x 9” Vinyl floor tile at room 336 storage	3% Asbestos
105.	Mastic for 9”x 9” vinyl floor tile at room 336 storage	No Asbestos Detected
106.	Brown leveler for 9”x 9” vinyl floor tile at room 336 storage	No Asbestos Detected
107.	Brown leveler under carpet at room 339	No Asbestos Detected
108.	Carpet glue at room 339	No Asbestos Detected
109.	Mastic for 9”x 9” vinyl floor tile under carpet at second floor main corridor	No Asbestos Detected
110.	Brown leveler for 9”x 9” vinyl floor tile under carpet at second floor main corridor	No Asbestos Detected
111.	Mastic for 9”x 9” vinyl floor tile under linoleum at room 236	No Asbestos Detected
112.	Brown leveler under carpet at room 140	No Asbestos Detected
113.	Black mastic on brown leveler under carpet at room 140	No Asbestos Detected
114.	Hard red leveler at perimeter of room 140	No Asbestos Detected
115.	Grey leveler under carpet at room 143	No Asbestos Detected
116.	Grey leveler under carpet at main corridor by room 237	No Asbestos Detected
117.	Old linoleum floor covering at room 236	30% Asbestos
118.	Brown adhesive for old linoleum floor covering at room 236	No Asbestos Detected
119.	Insulation inside wood fire door at closet door 137	40% Asbestos
120.	Black damproofing for sink at room 141	10% Asbestos
121.	Wall plaster at classroom 147	No Asbestos Detected
122.	Adhesive on wall plaster at classroom 147	No Asbestos Detected
123.	Skim coat on wall plaster at classroom 147	No Asbestos Detected

124.	Rough ceiling plaster at stairwell by classroom 138	No Asbestos Detected
125.	Rough ceiling plaster above 1'x 1' acoustical ceiling tile at main corridor by room 139	No Asbestos Detected
126.	Wall plaster at classroom 139	No Asbestos Detected
127.	Painted gypsum ceiling above 1'x 1' acoustical ceiling tile at room 143	No Asbestos Detected
128.	Skim coat on painted gypsum ceiling above 1'x 1' acoustical ceiling tile at room 143	2% Asbestos
129.	Painted gypsum ceiling at room 243	No Asbestos Detected
130.	1'x 1' Acoustical ceiling tile type I at room 143	No Asbestos Detected
131.	Glue daub for 1'x 1' acoustical ceiling tile type II above type I at room 336	No Asbestos Detected
132.	Glue daub for 1'x 1' acoustical ceiling tile type II above type I at room 140	No Asbestos Detected
133.	Glue daub for 1'x 1' acoustical ceiling tile type II above type I at room 143	No Asbestos Detected
134.	Acoustical ceiling tile type II on type I at room 143	No Asbestos Detected
135.	Exterior original framing caulking under window sill	3% Asbestos
136.	Exterior hard grey glazing caulking on window	No Asbestos Detected
137.	Exterior hard grey glazing caulking on window	2% Asbestos
138.	Exterior thick glazing caulking on window	2% Asbestos
139.	Exterior off white newer framing caulking on window	No Asbestos Detected
140.	Exterior pink unit vent grille framing caulking	No Asbestos Detected
141.	Exterior unit vent grille framing caulking	No Asbestos Detected
142.	Hard joint insulation at custodian room by room 113	No Asbestos Detected
143.	Hard joint insulation at garage	No Asbestos Detected
144.	1'x 1' Acoustical ceiling tile type I at room 210	No Asbestos Detected
145.	1'x 1' Acoustical ceiling tile type I at lobby	No Asbestos Detected
146.	2'x 4' Suspended acoustical ceiling tile at gymnasium lobby	No Asbestos Detected
147.	2'x 4' Suspended acoustical ceiling tile at kitchen	No Asbestos Detected
148.	2'x 4' Suspended acoustical ceiling tile at hall by room 109	No Asbestos Detected
149.	Wall joint compound at room 207	No Asbestos Detected
150.	Wall joint compound at room 314	No Asbestos Detected
151.	Wall joint compound at room 325	No Asbestos Detected
152.	Hard plaster at café entrance	No Asbestos Detected
153.	Wall plaster on joint compound at hall outside room 202	No Asbestos Detected
154.	Cementitious beige/grey material on beam at third floor hall by room 324	No Asbestos Detected
155.	Wall joint compound at room 214	No Asbestos Detected
156.	Vinyl baseboard at room 214	No Asbestos Detected
157.	Adhesive for vinyl baseboard at room 214	No Asbestos Detected
158.	Fireproofing at hall by room 324	No Asbestos Detected
159.	Fireproofing at hall by room 109	No Asbestos Detected
160.	Fireproofing at hall by café lobby	No Asbestos Detected
161.	Fireproofing at room 111-A	No Asbestos Detected
162.	Fireproofing at hall by room 206	No Asbestos Detected
163.	Pink framing caulking for interior door at girl's room by room 114	No Asbestos Detected
164.	Pink framing caulking for interior door at gym lobby ramp down to garage	No Asbestos Detected
165.	Vertical pink caulking in brick at café	No Asbestos Detected
166.	Vertical pink caulking in brick at center stairwell	No Asbestos Detected
167.	Glazing caulking for window in wood door at rooms 309/310	2% Asbestos
168.	Glazing caulking for window in wood door at main hall double door assembly	2% Asbestos
169.	Interior window glazing caulking at room 207	2% Asbestos
170.	Interior window glazing caulking at room 311	2% Asbestos
171.	Red sealant in seams of duct at area 305	No Asbestos Detected
172.	Adhesive for slate window sill at café lobby	No Asbestos Detected
173.	Adhesive for slate window sill at room 310	No Asbestos Detected
174.	Adhesive for slate window sill at room 206	No Asbestos Detected
175.	Hard joint insulation in pipe chase at first floor boy's room	No Asbestos Detected
176.	Pink framing caulking on interior door at entrance to generator room	No Asbestos Detected
177.	Glue tab for fiberglass insulated chiller unit at generator room	20% Asbestos
178.	Muffler exhaust of generator at generator room	10% Asbestos

179.	Generator exhaust header at generator room	No Asbestos Detected
180.	Hard joint insulation at generator room	No Asbestos Detected
181.	Mud on flange at generator room	No Asbestos Detected
182.	Cement ceiling at garage	No Asbestos Detected
183.	Coating on fiberglass ceiling tile at kitchen	No Asbestos Detected
184.	Canvas gasket on metal duct above ceiling at kitchen	60% Asbestos
185.	Grey damproofing for sink at room 214	No Asbestos Detected
186.	Transite table at room 212	20% Asbestos
187.	Vertical brown expansion joint in brick at custodian room by room 113	No Asbestos Detected
188.	Exposed tack board adhesive at hall outside room 202	No Asbestos Detected
189.	Partition wall at room 303	No Asbestos Detected
190.	Fabric covering on partition wall at room 303	No Asbestos Detected
191.	Horizontal brown expansion joint board between wall and floor at garage	No Asbestos Detected
192.	Hard brown expansion joint board in concrete of foundation wall at garage	No Asbestos Detected
193.	Black glue in hard brown expansion joint board in concrete of foundation wall at garage	No Asbestos Detected
194.	Off white 12”x 12” vinyl floor tile at room 224-A	3% Asbestos
195.	Mastic for off white 12”x 12” vinyl floor tile at room 224-A	10% Asbestos
196.	Off white 12”x 12” vinyl floor tile at room 113	3% Asbestos
197.	Mastic for off white 12”x 12” vinyl floor tile at room 113	10% Asbestos
198.	Carpet glue on mastic for off white 12”x 12” vinyl floor tile at room 113	No Asbestos Detected
199.	Off white 12”x 12” vinyl floor tile at janitor room by room 109	3% Asbestos
200.	Mastic for off white 12”x 12” vinyl floor tile at janitor room by room 109	5% Asbestos
201.	Unknown vinyl floor tile under carpet at room 210	3% Asbestos
202.	Carpet glue at room 210	No Asbestos Detected
203.	Grey/red/blue 12”x 12” vinyl floor tile at stairwell by room 212	No Asbestos Detected
204.	Mastic for grey/red/blue 12”x 12” vinyl floor tile at stairwell by room 212	No Asbestos Detected
205.	Grey/red/blue 12”x 12” vinyl floor tile at first floor hall by elevator	No Asbestos Detected
206.	Mastic for grey/red/blue 12”x 12” vinyl floor tile at first floor hall by elevator	5% Asbestos
207.	Black mastic on cement floor under rubber matting at gymnasium lobby	10% Asbestos
208.	Light brown mastic for vinyl base board at lobby stairwell	No Asbestos Detected
209.	Carpet glue at room 306	No Asbestos Detected
210.	Carpet glue at room 203	No Asbestos Detected
211.	New blue linoleum floor covering at room 111	No Asbestos Detected
212.	New blue/grey vinyl floor tile at garage stairwell up to café	No Asbestos Detected
213.	Mastic for blue/grey vinyl floor tile at garage stairwell up to café	No Asbestos Detected
214.	New light colored vinyl floor tile under carpet at room 208	No Asbestos Detected
215.	Duct insulation at penthouse	No Asbestos Detected
216.	Duct insulation at penthouse	No Asbestos Detected
217.	Hard joint insulation at penthouse	No Asbestos Detected
218.	Mud on flange at penthouse	No Asbestos Detected
219.	Fireproofing at stairs up to penthouse	No Asbestos Detected
220.	Red sealant on duct at penthouse	No Asbestos Detected
221.	Grey sealant on duct at penthouse	5% Asbestos
222.	Grey sealant on duct at penthouse	5% Asbestos
223.	Assumed roofing product seen behind exterior metal wall at penthouse	No Asbestos Detected
224.	Interior hard grey glazing caulking for exterior window at café lobby	2% Asbestos
225.	Interior soft grey glazing caulking for exterior window at café lobby	5% Asbestos
226.	Grey framing caulking between cement covered walkway and window at café lobby	No Asbestos Detected
227.	Horizontal white caulking in cement covered walkway at café lobby	No Asbestos Detected
228.	Interior grey glazing caulking for exterior window at room 206	2% Asbestos
229.	Vertical brown caulking within metal window framing system at café lobby	No Asbestos Detected
230.	Pink door framing caulking	No Asbestos Detected
231.	Pink unit vent grille caulking	No Asbestos Detected
232.	Pink window framing caulking at café lobby	No Asbestos Detected
233.	Vertical pink caulking in brick	No Asbestos Detected
234.	Beige brick	No Asbestos Detected

235.	Vertical brown expansion joint board between cement wall and brick	No Asbestos Detected
236.	Paper under hardwood floor at library	No Asbestos Detected
237.	Paper under hardwood floor at office 132-C	No Asbestos Detected
238.	Wall joint compound at basement former locker room areas	No Asbestos Detected
239.	Wall plaster at stairwell by room 131-C	No Asbestos Detected
240.	Mud on flange at compressor room	No Asbestos Detected
241.	Hard joint insulation at compressor room	No Asbestos Detected
242.	Old pipe hanger mud at compressor room	No Asbestos Detected
243.	Mud at air separator extension at compressor room	No Asbestos Detected
244.	Hard joint insulation at compressor room	No Asbestos Detected
245.	Valve mud fitting at compressor room	No Asbestos Detected
246.	Ceiling plaster at compressor room	No Asbestos Detected
247.	Fiberglass insulation on floor at attic	No Asbestos Detected
248.	Wall plaster at attic	No Asbestos Detected
249.	Assumed roofing debris on wood beams at attic	No Asbestos Detected
250.	Transite siding on cooling unit on roof	20% Asbestos
251.	Interior paper filtering system of cooling unit on roof	60% Asbestos
252.	1'x 1' Acoustical ceiling tile type I at main corridor by room 140	No Asbestos Detected
253.	Fancy ceiling trim at mechanical room 150	No Asbestos Detected
254.	Wall joint compound at main corridor by room 142	No Asbestos Detected
255.	Wall plaster at room 239	No Asbestos Detected
256.	Wall plaster at room 139 closet	No Asbestos Detected
257.	Wall plaster on gypsum at hall by room 150	No Asbestos Detected
258.	Ceiling plaster at custodian room by room 151	No Asbestos Detected
259.	Rough ceiling plaster at mechanical room 150	No Asbestos Detected
260.	Hard red leveler on brown leveler at room 242	No Asbestos Detected
261.	Top layer light grey leveler at main corridor by room 140	No Asbestos Detected
262.	Bottom layer thick dark grey leveler at main corridor by room 140	No Asbestos Detected
263.	Composite of grey/brown leveler and mastic at main corridor by room 140	No Asbestos Detected
264.	Brown leveler under carpet at second floor main corridor by room 248	No Asbestos Detected
265.	Mastic for brown leveler under carpet at second floor main corridor by room 248	No Asbestos Detected
266.	Grey leveler under carpet at main corridor by room 143	No Asbestos Detected
267.	Brown leveler under grey leveler carpet at main corridor by room 143	No Asbestos Detected
268.	Thin grey leveler under carpet on cement at room 139	No Asbestos Detected
269.	Green 9"x 9" vinyl floor tile at room 139 closet	5% Asbestos
270.	Mastic for green 9"x 9" vinyl floor tile at room 139 closet	No Asbestos Detected
271.	Brown leveler under green 9"x 9" vinyl floor tile at room 139 closet	No Asbestos Detected
272.	Mastic for 9"x 9" vinyl floor tile under carpet at room 241	No Asbestos Detected
273.	Carpet glue at room 241	No Asbestos Detected
274.	Residue red leveler under carpet at room 141	No Asbestos Detected
275.	Off white 12"x 12" vinyl floor tile at room 142	3% Asbestos
276.	Mastic for off white 12"x 12" vinyl floor tile at room 142	5% Asbestos
277.	Newer white/grey/green vinyl floor tile at room 138	No Asbestos Detected
278.	Thick colors vinyl floor tile at custodian room by room 245	No Asbestos Detected
279.	Various colored vinyl floor tile at stairwell by room 143	No Asbestos Detected
280.	Mastic for various colored vinyl floor tile at stairwell by room 143	No Asbestos Detected
281.	Old linoleum covering on heating cabinet at room 239	30% Asbestos
282.	Grey damproofing on sink at room 139	No Asbestos Detected
283.	Linoleum covering on heating cabinet at room 138	No Asbestos Detected
284.	Molding for heating cabinet at room 139	No Asbestos Detected
285.	Glue daub for 1'x 1; acoustical ceiling tile at room 339-A	No Asbestos Detected
286.	Insulation inside wood fire door at room 141	10% Asbestos
287.	Interior window glazing caulking at stairwell by room 143	2% Asbestos
288.	Glazing caulking for window in metal door at stairwell by room 237	No Asbestos Detected

289.	Original tack board at room 138	No Asbestos Detected
290.	Adhesive for original tack board at room 138	No Asbestos Detected
291.	Insulation inside wood fire door at mechanical room 150	30% Asbestos
292.	Red sealant on duct at crawl space	No Asbestos Detected
293.	Debris on cement floor at crawl space	30% Asbestos
294.	New grey vinyl floor tile at room 147	No Asbestos Detected
295.	Exterior old framing caulking under newer window	2% Asbestos

Observations and Conclusions
All ACM that might be disturbed during the proposed renovation and demolition activities must be removed by a Massachusetts licensed asbestos abatement contractor under the supervision of Massachusetts licensed project monitors.

Damproofing on exterior and foundation walls throughout the school was found to contain asbestos. Abatement of the damproofing is not required to be performed by a licensed asbestos abatement contractor. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle. An abatement plan would be required to be prepared and submitted to the DEP for approval.

1924 Building:

1. Off white vinyl floor tiles and mastic were found to contain asbestos. The ACM was found at various locations.
2. Mastic for newer white/grey vinyl floor tile on plywood was found to contain asbestos. The ACM was found at various locations.
3. Paper backing for small round light fixture was found to contain asbestos. The ACM was found at various locations.
4. Exterior framing caulking on old door was found to contain asbestos and assumed to contain PCB's.
5. Exterior vertical grey caulking where buildings 1924 and 1952 meet was found to contain asbestos and assumed to contain PCB's.
6. Pipe and hard joint insulation was assumed to contain asbestos. The ACM was found at throughout the building. The ACM was assumed to exist in pipe chases and above ceilings.
7. Damproofing on sink was assumed to contain asbestos.
8. Insulation inside boilers was assumed to contain asbestos.
9. Vibration damper was assumed to contain asbestos. The ACM was found in the boiler room.
10. Transite wall panels were assumed to contain asbestos. The ACM was found behind plywood at large gymnasium.
11. Transite siding was found to contain asbestos. The ACM was found on cooling unit on roof.
12. Interior paper filtering system was found to contain asbestos. The ACM was found on cooling unit on roof.
13. Framing caulking on interior windows was found to contain asbestos and assumed to contain PCB's. The same types of windows were found in the 1952 and 1976 buildings.
14. Exterior old framing caulking under newer window was found to contain asbestos and assumed to contain PCB's. It appears that newer windows were installed over older frames.
15. All remaining suspect materials were found not to contain asbestos.

1952 Building:

1. 9"x 9" Vinyl floor tile and mastic were found to contain asbestos. The ACM was found at various locations. The ACM was mostly found under carpet and other types of flooring.
2. Off white vinyl floor tiles and mastic were found to contain asbestos. The ACM was found at various locations.
3. Old linoleum floor covering was found to contain asbestos. The ACM was found at various locations.
4. Insulation inside wood fire door was found to contain asbestos. The ACM was found at various locations.
5. Black damproofing for sink was found to contain asbestos. The ACM was found at various locations.
6. Skim coat on painted gypsum ceiling above 1'x 1' acoustical ceiling tile was found to contain asbestos. The ACM was found at various locations.
7. Debris on cement floor at crawl space was found to contain asbestos. The ACM was also found intermixed with soil.
8. Old linoleum covering on heating cabinet was found to contain asbestos. The ACM was found at various locations.

9. Exterior original framing caulking under window sill was found to contain asbestos and assumed to contain PCB's.
10. Exterior hard grey glazing caulking on window was found to contain asbestos and assumed to contain PCB's.
11. Exterior thick glazing caulking on window was found to contain asbestos and assumed to contain PCB's.
12. Framing caulking on interior windows was found to contain asbestos and assumed to contain PCB's.
13. Pipe and hard joint insulation was assumed to contain asbestos. The ACM was found at various locations. The ACM was also found in the crawl spaces. The ACM was assumed to exist in pipe chases and above ceilings.
14. Transite panels were assumed to contain asbestos. The ACM was found in heating cabinets, over exit door and in crawl spaces as separation walls.
15. Paper backing for small round light fixture was assumed to contain asbestos. The ACM was found at various locations.
16. All remaining suspect materials were found not to contain asbestos.

1976 Building:

1. Glazing caulking for window in wood door was found to contain asbestos and assumed to contain PCB's.
2. Framing caulking on interior windows was found to contain asbestos and assumed to contain PCB's.
3. Glue tab for fiberglass insulated chiller unit was found to contain asbestos. The ACM was found at generator room.
4. Muffler exhaust of generator was found to contain asbestos. The ACM was found at generator room.
5. Canvas gasket on metal duct was found to contain asbestos. The ACM was found at kitchen.
6. Transite table was found to contain asbestos. The ACM was found at various locations.
7. Transite panel inside fume hood was assumed to contain asbestos. The ACM was found at classroom.
8. Off white vinyl floor tiles and mastic were found to contain asbestos. The ACM was found at various locations. The ACM was also found under newer types of flooring.
9. Unknown vinyl floor tile under carpet was found to contain asbestos. The ACM was found at various locations.
10. Mastic for grey/red/blue 12"x 12" vinyl floor tile was found to contain asbestos. The ACM was found at various locations.
11. Black mastic on cement floor under rubber matting was found to contain asbestos. The ACM was found at various locations.
12. Grey sealant on duct was found to contain asbestos. The ACM was found at penthouse.
13. Interior hard grey glazing caulking for exterior window was found to contain asbestos and assumed to contain PCB's.
14. Interior grey glazing caulking for exterior window was found to contain asbestos and assumed to contain PCB's.
15. Damproofing for sink was assumed to contain asbestos. The ACM was found at various locations.
16. Kiln brick was assumed to contain asbestos.
17. All remaining suspect materials were found not to contain asbestos.

School Building:

1. Glue holding blackboards and tackboards was assumed to contain asbestos.
2. Underground sewer pipes were assumed to contain asbestos (transite).
3. Roofing and flashing material under rubber roofing was assumed to contain asbestos. However, roofing material is not required to be removed by a licensed asbestos contractor prior to renovation or demolition.

Lead Based Paint (LBP):

Observations and Conclusions
The subject property is a three story elementary school building. The building is characterized by plaster, concrete, and brick walls, plaster ceilings, metal and wooden doors, metal door casing/jambs, metal and wooden window trim, vinyl replacement window sashes and metal casement windows. The exterior is unpainted brick with painted trim work.

Interior LBP, as measured by XRF, was detected on plaster and brick walls, a concrete floor, wooden chair rail, wooden baseboard, metal doors, metal door casing/jambs, metal door lintels, metal window sills, metal window frames, metal casement window sashes, metal columns, plaster columns, metal staircase treads, risers, balusters, newel post and stringer.

Exterior LBP, as measured by XRF, was detected on a wooden door casing/jamb. Metal flashing, metal floor drain and a metal door on the roof tested positive.
LBP was found on all painted surfaces. A school is not considered a regulated facility therefore the Massachusetts Lead Law does not apply. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations. According to OSHA, any amount of LBP triggers compliance.

PCB's-Electrical Equipment and Light Fixtures:

Observations and Conclusions
Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's. Tubes in light fixtures, thermostats, exist-signs and switches were assumed to contain mercury. It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill as part of the demolition project.

3. COST ESTIMATES:

The cost includes removal and disposal of all accessible ACM, hazardous materials and an allowance for removal of inaccessible or hidden ACM that may be found during the renovation or demolition project.

Location	Material	Approximate Quantity	Cost Estimate ($)
1924 Building:			
Various Locations	Flooring Materials and Mastic	6,000 SF	24,000.00
	Interior Windows	90 Total	13,500.00
	Sink	1 Total	100.00
	Round Light Fixtures	12 Total	600.00
	Pipe and Hard Joint Insulation	1,800 LF	36,000.00
	Blackboards/Tackboards	20 Total	4,000.00
	Walls and Ceilings Demolition to Access ACM	Unknown	30,000.00
	Miscellaneous and Hidden ACM	Unknown	15,000.00
Boiler Room	Boilers	2 Total	12,500.00
	Flexible Connector	1 Total	100.00
Large Gymnasium	Transite Panels	900 SF	9,000.00
Roof Cooling Unit	Transite Panels	300 SF	3,000.00
	Paper Filter System	150 SF	1,500.00
1952 Building:			
Various Locations	Flooring Materials and Mastic	15,000 SF	60,000.00
	Transite inside Heating Cabinets	1,000 SF	7,000.00
	Interior Windows	80 Total	12,000.00
	Wood Fire Doors	6 Total	1,200.00
	Sinks	15 Total	1,500.00
	Round Light Fixtures	2 Total	100.00

Location	Material	Approximate Quantity	Cost Estimate ($)
	Skim Coat Ceiling Material	8,000 SF	40,000.00
	Pipe and Hard Joint Insulation	100 LF	2,000.00
	Blackboards/Tackboards	40 Total	8,000.00
	Walls and Ceilings Demolition to Access ACM	Unknown	20,000.00
	Miscellaneous and Hidden ACM	Unknown	15,000.00
Crawl Space #1	Pipe and Hard Joint Insulation	1,300 LF	26,000.00
	Soil and Debris	6,000 SF	12,000.00
	Transite Wall	600 SF	3,000.00
Crawl Space #2	Pipe and Hard Joint Insulation	1,300 LF	26,000.00
	Soil and Debris	7,000 SF	14,000.00
	Transite Wall	750 SF	3,750.00
Room 150	Transite Panel	15 SF	150.00
1976 Building:			
Various Locations	Flooring Materials and Mastic	23,000 SF	92,000.00
	Transite Tables	600 SF	6,000.00
	Interior Doors	80 Total	12,000.00
	Interior Windows	70 Total	10,500.00
	Sinks	6 Total	300.00
	Kiln	1 Total	500.00
	Fume Hood	1 Total	2,500.00
	Round Light Fixtures	2 Total	100.00
	Blackboards/Tackboards	30 Total	6,000.00
	Miscellaneous and Hidden ACM	Unknown	15,000.00
Generator Room	Exhaust (Accessible/Hidden)	130 LF	3,900.00
	Glue Tabs	6 SF	100.00
Kitchen	Canvas Gasket	100 SF	2,000.00
Penthouse	Grey Sealant on Duct	100 SF	2,000.00
Throughout School	Light Fixtures Tubes	8,000 Total	40,000.00
Exterior	Windows	600 Total	150,000.00
	Doors	28 Total	5,600.00
	Caulking	50 LF	500.00
	Damproofing/Flashing on Foundation Walls	800 Tons	88,000.00
	Damproofing on Walls	4,500 Tons	495,000.00
	Sewer Transite Pipes	Unknown	25,000.00
	Underground Oil Tanks	2 Total	15,000.00
Engineering Fees:			
Estimated Fees for Design, Construction Monitoring and Sampling Services			92,000.00
Estimated Fees for PCB's Testing			15,000.00

Location	Material	Approximate Quantity	Cost Estimate ($)
Estimated Fees for PCB's Abatement Plan[1]			10,000.00
Estimated Fees for PCB's Abatement[1]			170,000.00
Estimated Fees for Post PCB's Remediation Testing and Notifications[1]			35,000.00
		Total Cost:	**1,700,000.00**

1: Assuming PCB's is found.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

Asbestos:
Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5-85-030a.

Bulk material samples were analyzed using PLM and dispersion staining techniques with EPA method 600/M4-82-020.

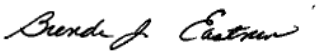
Lead Based Paint:
LBP testing was conducted by Brenda Eastman, I-3691, an inspector licensed by the Massachusetts Department of Public Health's Childhood Lead Poisoning Prevention Program, in accordance with the Massachusetts Lead Paint Law.

The on-site testing of painted surfaces was performed using an RMD X-Ray Fluorescence (XRF) analyzer, serial number LPA 1032. The inspector has successfully completed the manufacturer's training requirements.

Inspected By:

Leonard J. Busa
Asbestos Inspector

Inspected by:



Brenda Eastman
Massachusetts Lead Inspector/Risk Assessor I-3691

5.0 LIMITATIONS AND CONDITIONS:

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

UEC universal environmental consultants

February 28, 2014

Ms. Deborah Collins
HMFH Architects
130 Bishop Allen Drive
Cambridge, MA 02139

Reference: Polychlorinated Biphenyls (PCB's) Testing Services at the Devotion School, Brookline, MA

Dear Ms. Collins:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

UEC was contracted to perform testing for Polychlorinated Biphenyls (PCB's) in door, expansion joint and window framing and glazing caulking at the Devotion School, Brookline, MA. Testing was performed on Wednesday, February 19, 2014. Bulk samples were collected by Mr. Jason Becotte.

Samples results and floor plans are attached.

Twenty (20) bulk samples were collected and analyzed for PCB's. Results in seventeen of the samples indicated that no PCB's was found. Result in three of the samples indicated that levels of PCB's (1.5, 1.5 & 10.9 mg/kg) were found to be much lower than EPA limit. Bulk sample is determined to contain PCB's if any sample was found to contain more than 50 mg/kg of PCB's for proper disposal.

Bulk samples were analyzed by a Massachusetts licensed laboratory EMSL, Cinnaminson, NJ in accordance with EPA Method 3540C/8082.

Please do not hesitate to call me at (508) 628-5486 if you have questions about our services.

Very truly yours,

Universal Environmental Consultants

Ammar M. Dieb
President

UEC:\214 063\Report.DOC

Enclosure

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: Env_Chemistry@emsl.com

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702
Phone: (508) 628-5486
Fax: (508) 628-5488

2/27/2014

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 2/20/2014. The results are tabulated on the attached data pages for the following client designated project:

Brookline, MA Devotion School

The reference number for these samples is EMSL Order #011400729. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director

The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The reporting limits for -0008 were elevated due to sample matrix interference.

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

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CustomerID: UEC63
CustomerPO:
ProjectID:

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Phone: (508) 628-5486
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Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 1 ***Collected:*** 2/19/2014 ***Lab ID:*** *0001*
Interior window glaze @ Room 324

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.86	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 2 ***Collected:*** 2/19/2014 ***Lab ID:*** *0002*
Interior window glaze Hall @ auditorium

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.77	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 3 ***Collected:*** 2/19/2014 ***Lab ID:*** *0003*
Interior window glaze Hall @ 241

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	1.5	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.89	mg/Kg	2/21/2014	CF	2/25/2014	EH

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Phone: (508) 628-5486
Fax: (508) 628-5488
Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 4 ***Collected:*** 2/19/2014 ***Lab ID:*** *0004*
Interior Door glaze Room 303 wood door

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.57	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 5 ***Collected:*** 2/19/2014 ***Lab ID:*** *0005*
Interior Door glaze Hall @ auditorium

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.85	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 6 ***Collected:*** 2/19/2014 ***Lab ID:*** *0006*
Interior Door glaze Room 243 wood

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.87	mg/Kg	2/21/2014	CF	2/25/2014	EH

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Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 7 exterior window caulk 1954 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0007*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.60	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 8 exterior window caulk 1954 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0008*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.95	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.95	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.95	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	1.5	0.95	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	ND	4.7	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	4.7	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	4.7	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	ND	4.7	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.95	mg/Kg	2/21/2014	CF	2/26/2014	EH

Client Sample Description 9 exterior window caulk 1913 Building old window ***Collected:*** 2/19/2014 ***Lab ID:*** *0009*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH

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Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 10 ***Collected:*** 2/19/2014 ***Lab ID:*** *0010*
exterior window caulk Gym window

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
3540C/8082A	Aroclor-1016	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.94	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 11 ***Collected:*** 2/19/2014 ***Lab ID:*** *0011*
exterior window caulk 1976 Building

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
3540C/8082A	Aroclor-1016	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.60	mg/Kg	2/21/2014	CF	2/26/2014	EH

Client Sample Description 12 ***Collected:*** 2/19/2014 ***Lab ID:*** *0012*
exterior caulk glaze 1976 Building

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
3540C/8082A	Aroclor-1016	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH

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Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 13 exterior window glaze 1954 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0013*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.98	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 14 exterior window glaze 1913 Building old window ***Collected:*** 2/19/2014 ***Lab ID:*** *0014*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.99	mg/Kg	2/21/2014	CF	2/25/2014	EH

Client Sample Description 15 exterior window glaze 1976 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0015*

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.97	mg/Kg	2/21/2014	CF	2/25/2014	EH

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EMSL Order: 011400729
CustomerID: UEC63
CustomerPO:
ProjectID:

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488
Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 16 ***Collected:*** 2/19/2014 ***Lab ID:*** *0016*
exterior door caulk 1954 Building

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.97	mg/Kg	2/21/2014	CF	2/26/2014	EH

Client Sample Description 17 ***Collected:*** 2/19/2014 ***Lab ID:*** *0017*
exterior door caulk 1913 Building Rear

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.70	mg/Kg	2/21/2014	CF	2/26/2014	EH

Client Sample Description 18 ***Collected:*** 2/19/2014 ***Lab ID:*** *0018*
exterior door caulk 1976 Building

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3540C/8082A	Aroclor-1016	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1221	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1232	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1242	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1248	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1254	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1260	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1262	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH
3540C/8082A	Aroclor-1268	ND	0.81	mg/Kg	2/21/2014	CF	2/25/2014	EH

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EMSL Order: 011400729
CustomerID: UEC63
CustomerPO:
ProjectID:

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488
Received: 02/20/14 9:30 AM

Project: **Brookline, MA Devotion School**

Analytical Results

Client Sample Description 19 expansion joint caulk 1954 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0019*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
3540C/8082A	Aroclor-1016	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH

Client Sample Description 20 expansion joint caulk 1976 Building ***Collected:*** 2/19/2014 ***Lab ID:*** *0020*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date*	*Analyst*	*Analysis Date*	*Analyst*
3540C/8082A	Aroclor-1016	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1221	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1232	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1242	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1248	5.6	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1254	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1260	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1262	5.3	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH
3540C/8082A	Aroclor-1268	ND	0.98	mg/Kg	2/21/2014	CF	2/26/2014	EH

Definitions:
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit

EMSL Analytical Inc.

SOIL / SOLID SURROGATE RECOVERY

Lab Name: EMSL Analytical

*** : Values outside of QC limits**

D: Surrogate diluted out

	Compound Name:	TCX	TCX2	DCB	DCB2	**Total Out**
	CAS #:	877-09-8	877-09-8	2051-24-3	2051-24-3	
	QC Limits:	(30-137)	(30-137)	(30-138)	(30-138)	
MB 1 OP 3004-45	02/24/14 10:08	76	65	81	80	0
LCS 1 OP 3004-45	02/24/14 10:37	75	63	79	78	0
0726-7 10X CU	02/24/14 11:06	91 D	92 D	98 D	110 D	0
0726-8 10X CU	02/24/14 11:35	87 D	87 D	99 D	110 D	0
0726-8 PCB MS	02/24/14 12:03	95 D	93 D	101 D	113 D	0
0726-8 PCB MSD	02/24/14 12:32	88 D	87 D	100 D	108 D	0
0729-6 4X CU	02/25/14 13:22	85 D	83 D	85 D	91 D	0
0729-7 10X CU	02/25/14 13:51	65 D	69 D	74 D	83 D	0
0729-1 10X CU	02/25/14 10:54	88 D	90 D	80 D	97 D	0
0729-2 10X CU	02/25/14 11:24	89 D	91 D	76 D	86 D	0
0729-3 10X CU	02/25/14 11:54	90 D	94 D	96 D	103 D	0
0729-4 10X CU	02/25/14 12:23	86 D	90 D	76 D	91 D	0
0729-5 10X CU	02/25/14 12:53	86 D	88 D	76 D	89 D	0
0729-13 10X CU	02/25/14 14:23	88 D	98 D	88 D	97 D	0
0729-14 10X CU	02/25/14 14:50	78 D	93 D	84 D	94 D	0
0729-15 10X CU	02/25/14 15:16	90 D	102 D	88 D	96 D	0
0729-9 10X CU	02/25/14 16:10	63 D	65 D	59 D	56 D	0
0729-18 10X CU	02/25/14 16:36	52 D	62 D	42 D	48 D	0
0729-10 4X CU	02/25/14 16:39	59 D	59 D	59 D	58 D	0
0729-12 10X CU	02/25/14 17:56	48 D	56 D	46 D	51 D	0
MB 1 OP 3004-45	02/26/14 14:05	73	62	82	82	0
LCS 1 OP 3004-45	02/26/14 14:34	68	57	74	73	0
0729-8 4X SG	02/26/14 15:03	56 D	57 D	62 D	68 D	0
0729-11 5X SG	02/26/14 15:32	69 D	68 D	78 D	84 D	0
0729-16 4X SG	02/26/14 16:02	48 D	47 D	53 D	57 D	0
0729-17 5X SG	02/26/14 16:32	46 D	47 D	53 D	58 D	0
0729-19 4X SG	02/26/14 17:01	47 D	45 D	49 D	54 D	0
0729-20 4X SG	02/26/14 17:31	71 D	67 D	75 D	81 D	0
0729-8 20X SG	02/26/14 18:00	D	D	D	D	0

TCX=Tetrachloro-m-xylene
DCB=Decachlorobiphenyl

EMSL Analytical Inc.

PCB ORGANICS ANALYSIS DATA SHEET

		Customer Sample#:	MB 1 OP 3004-45 CU
Lab Name:	EMSL Analytical		
EMSL Sample ID:		**Project:**	
Lab File ID:	Y29032.D	**Sample Matrix:**	SOIL / SOLID
Instrument ID:	ECD-Y	**Sampling Date:**	12:00:00 AM
Analyst:	EH	**Date Extracted:**	2/21/2014
GC Column:	CLPest I (0.25 mm)	**Analysis Date**	2/24/2014 10:08:00 AM
GC Column 2:	CLPest II (0.25 mm)	**Sample wt/vol:**	10 G
% Moisture:	0	**Dilution Factor:**	1
PH:	0	**Concentrated Extract Vol:**	10 (mL)
GPC Cleanup(Y/N):	N	**Injection Volume:**	1 (ul)
Extraction Type:	3540C	**Sulfur Cleanup:**	N
Method:	SW846 8081b/8082a		

CAS NO	COMPOUND	Report Limit (mg/Kg)	CONC. (mg/Kg)	Q
12674-11-2	Aroclor 1016	0.050		U
11104-28-2	Aroclor 1221	0.050		U
11141-16-5	Aroclor 1232	0.050		U
53469-21-9	Aroclor 1242	0.050		U
12672-29-6	Aroclor 1248	0.050		U
11097-69-1	Aroclor 1254	0.050		U
11096-82-5	Aroclor 1260	0.050		U
37324-23-5	Aroclor 1262	0.050		U
11100-14-4	Aroclor 1268	0.050		U

Qualifier Definitions
U = Undetected
B = Compound detected in method blank
E = Estimated value
D = Dilution
P = Results between the two columns differ >40%

Printed: 02/27/14 11:50:38 AM
SampleList: QC Batch OP 3004-45
ERM: K:\EMSL_ENV\ERMs\8081-8082\8082soil.erm

FORM1--PET

Page 10 of 12

1 of 1

EMSL Analytical Inc.

SOIL / SOLID LCS/QCS/ LFB RECOVERY

	Lab Name:	EMSL Analytical		**Original**	LCS 1 OP		
				File ID:	Y29032.D/Y29033.D		
	*** : Values outside of QC**						
	COMPOUND	**CAS NO**	**LOW LIMIT**	**HIGH LIMIT**	**SPIKE ADDED mg/Kg**	**LCS CONC. mg/Kg**	**LCS REC%**
1	Aroclor 1016	12674-11-2	58	123	1.50	1.24	83
2	Aroclor 1260	11096-82-5	63	131	1.50	1.19	79
				Total Out			0 of 2

EMSL Analytical Inc.

SOIL / SOLID MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

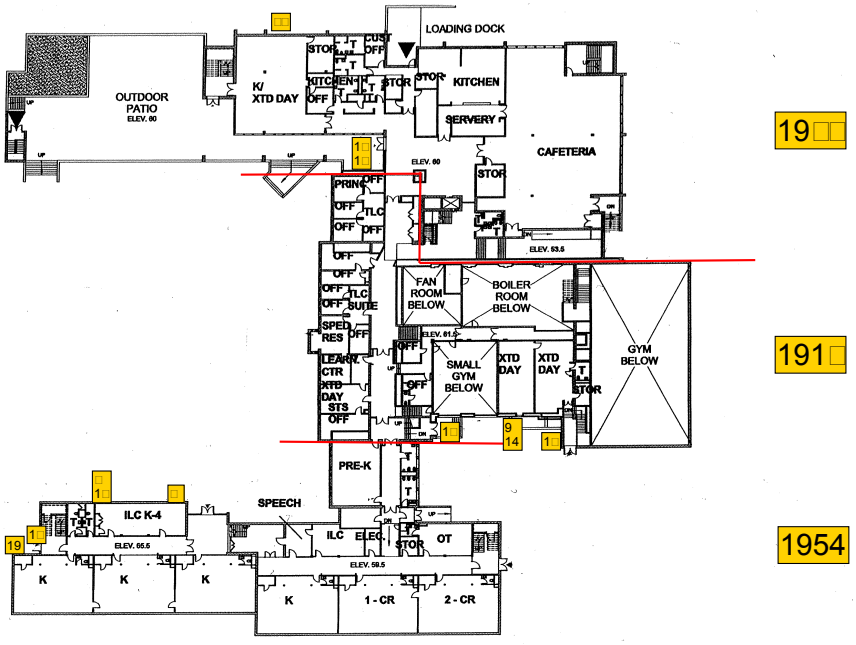
	Lab Name:	EMSL Analytical		**Original**		0726-8 PCB MS 10X							
				File ID:		Y29035.D/Y29036.D/Y29037.D							
	*** : Values outside of QC**												
	COMPOUND	**CAS NO**	**LOW LIMIT**	**HIGH LIMIT**	**RPD LIMIT**	**SAMPLE CONC.**	**MS SPIKE ADDED mg/Kg**	**MS CONC. mg/Kg**	**MS REC%**	**MSD SPIKE ADDED mg/Kg**	**MSD CONC. mg/Kg**	**MSD REC%**	**RPD %**
1	Aroclor 1016	12674-11-2	12	164	25	0.00	1.50	1.78	119	1.50	1.72	115	3
2	Aroclor 1260	11096-82-5	43	167	25	0.00	1.50	1.64	109	1.50	1.58	106	3
				Total Out					0 of 2			0 of 2	0 of 2

Printed: 02/27/14 11:52:15 AM
SampleList: QC Batch OP 3004-45
ERM: K:\EMSL_ENV\ERMs\8081-8082\8082soil.erm

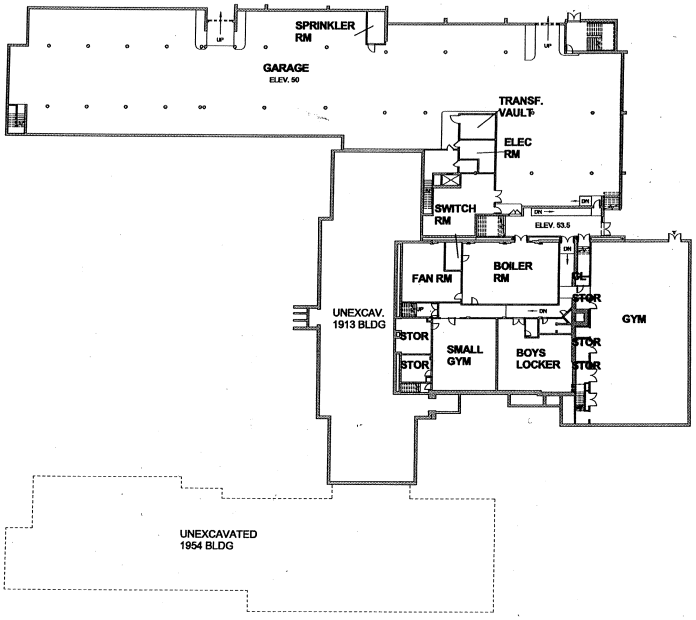
FORM III PET_2

Page 12 of 12

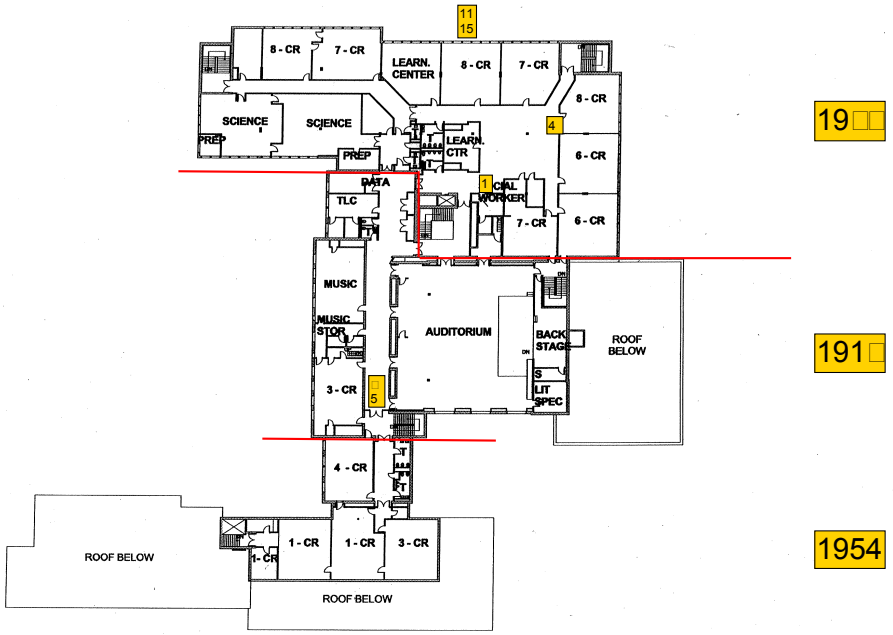
1 of



EXISTING FIRST FLOOR PLAN
Edward Devotion School
Brookline, MA



EXISTING BASEMENT FLOOR PLAN
Edward Devotion School
Brookline, MA

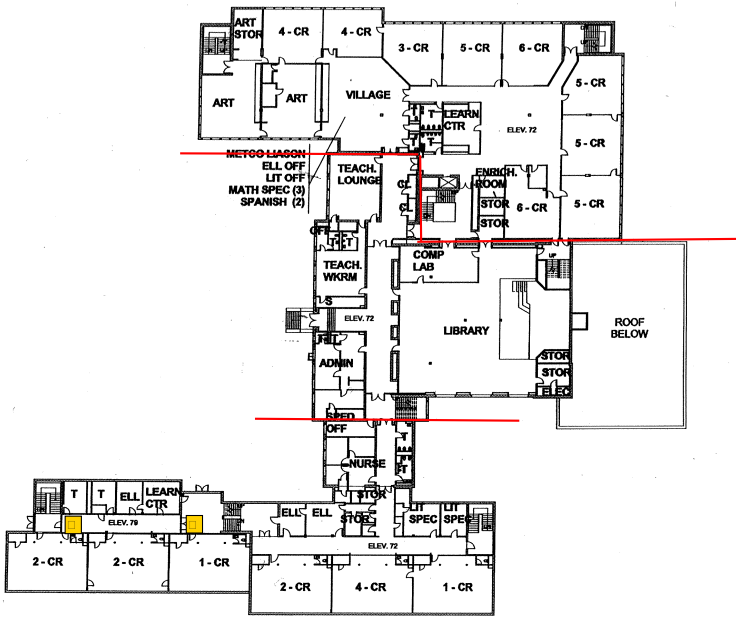


19□□

191□

1954

EXISTING THIRD FLOOR PLAN
Edward Devotion School
Brookline, MA



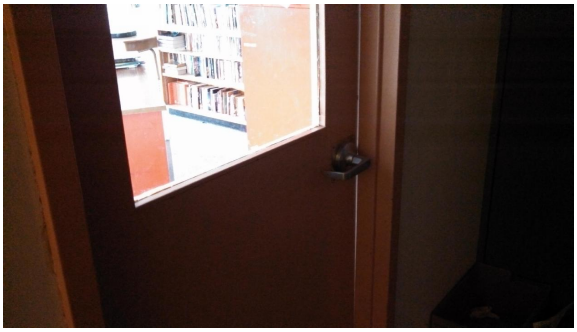
19□□

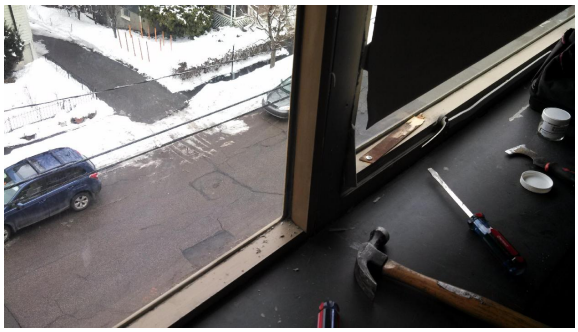
191□

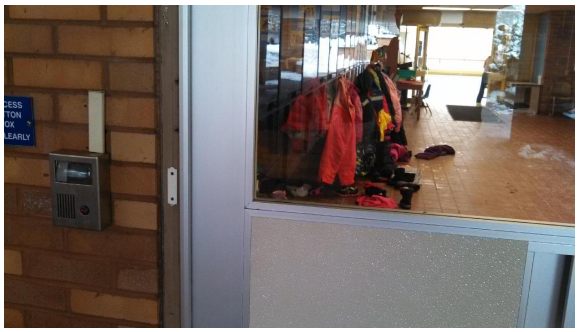
1954

EXISTING SECOND FLOOR PLAN
Edward Devotion School
Brookline, MA

19□□







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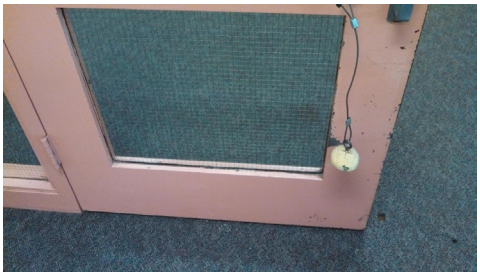


WELCOME TO OUR SCHOOL
Visitors must report to the Main Office

1954

Clean Towels
Clean Blankets
CupCake Sale

Appendix I

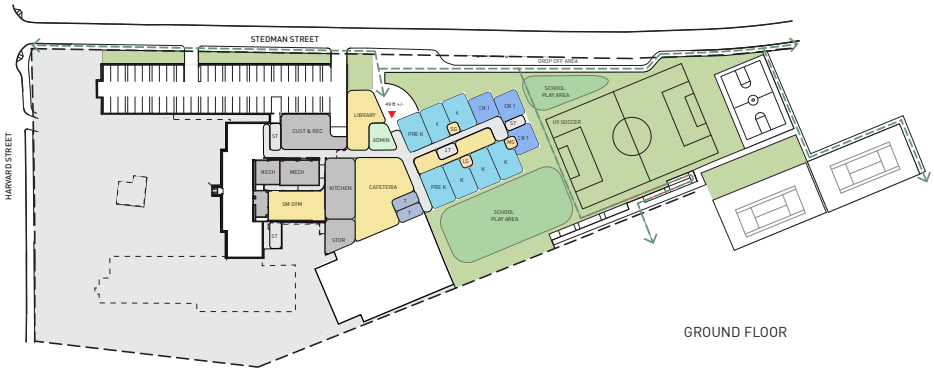
Architectual Alternative Options

Alternative Options 223

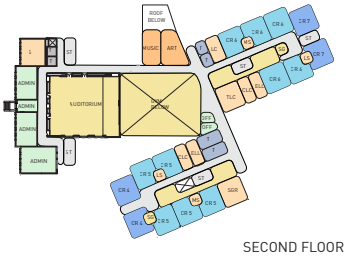
Alternative Options Attribute Matrix 229

FIRST FLOOR

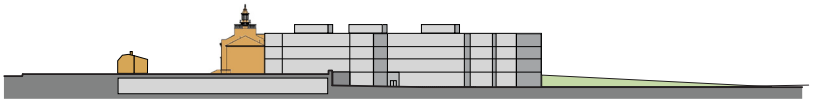
THIRD FLOOR



GROUND FLOOR



SECOND FLOOR

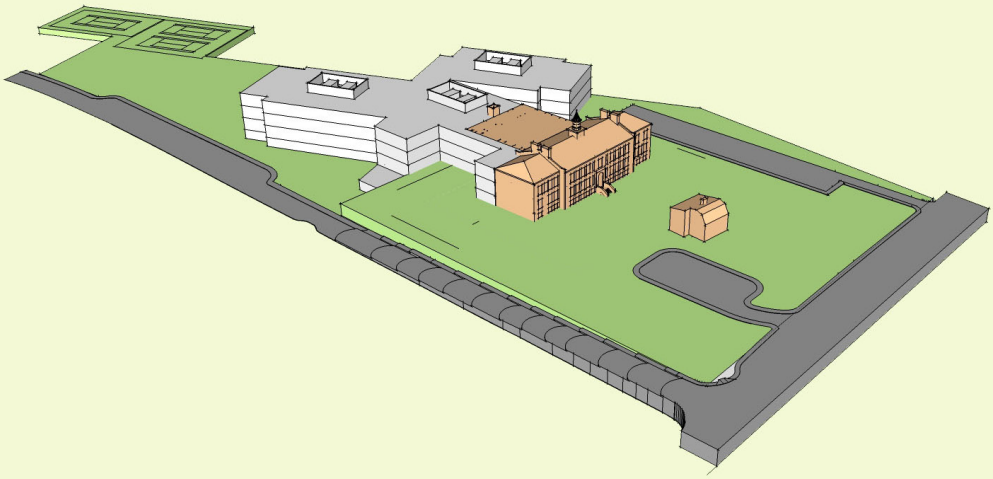


SECTION

Concept Diagrams - Option 1.2

DEVOTION SCHOOL
Brookline, MA
3/7/14

- Administration
- Shared Spaces
- Circulation
- Mechanical
- Academic
- Classroom Cluster 1
- Classroom Cluster 2
- Classroom Cluster 3
- Special Education
- Toilets



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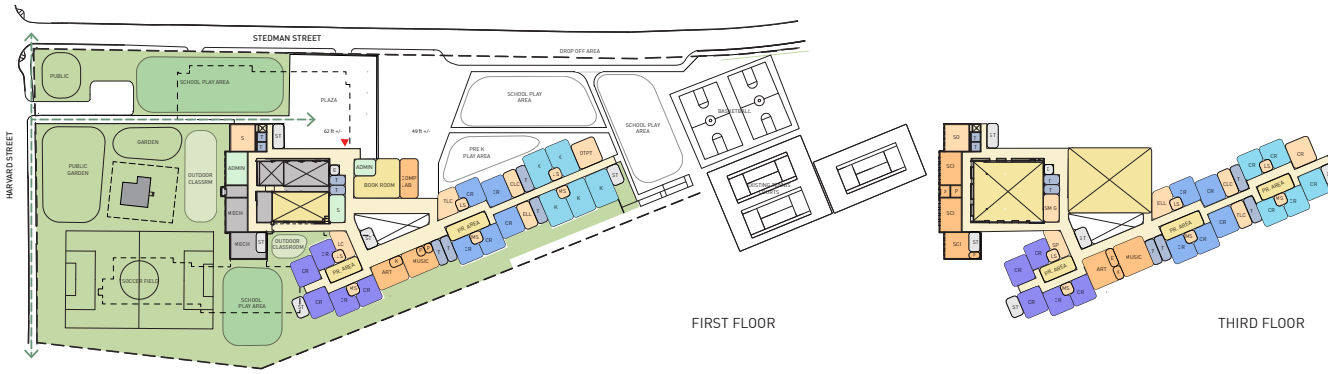
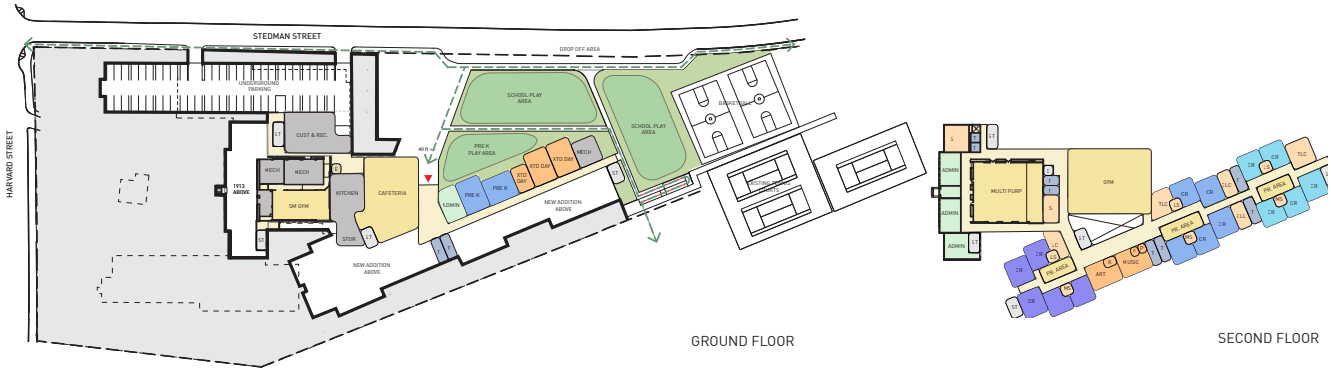
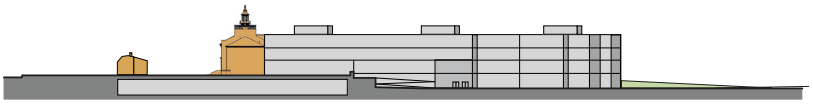




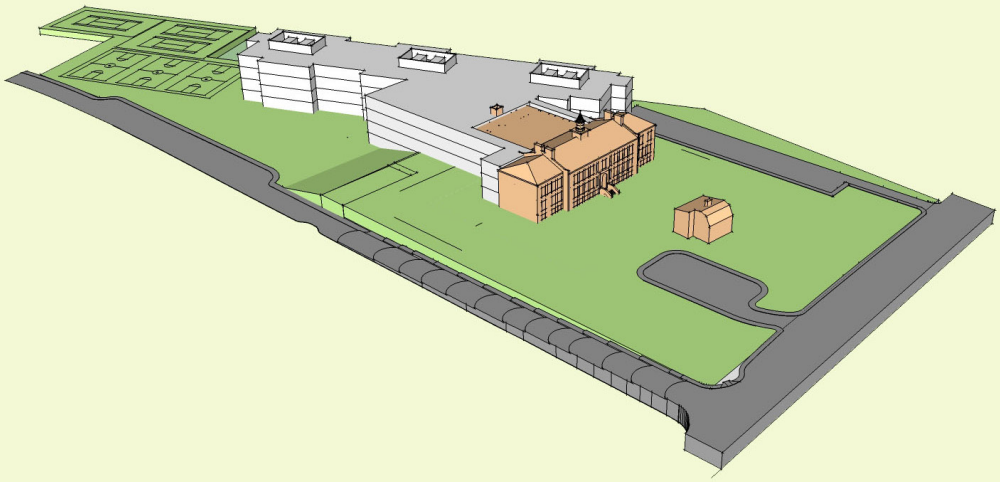


SECTION

DEVOTION SCHOOL
Brookline, MA
3/7/14

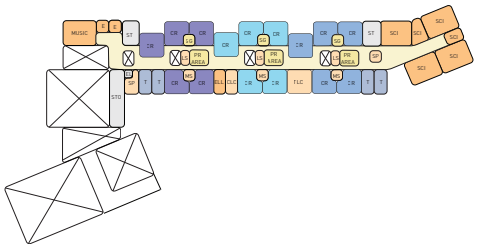
Administration
Shared Spaces
Circulation
Mechanical
Classroom Cluster 1
Classroom Cluster 2
Classroom Cluster 3
Special Education

Concept Diagrams - Option 1.3



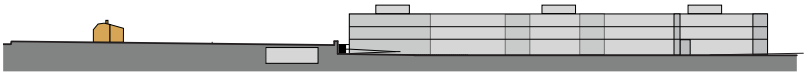
1.3

FIRST FLOOR



SECOND FLOOR

GROUND FLOOR

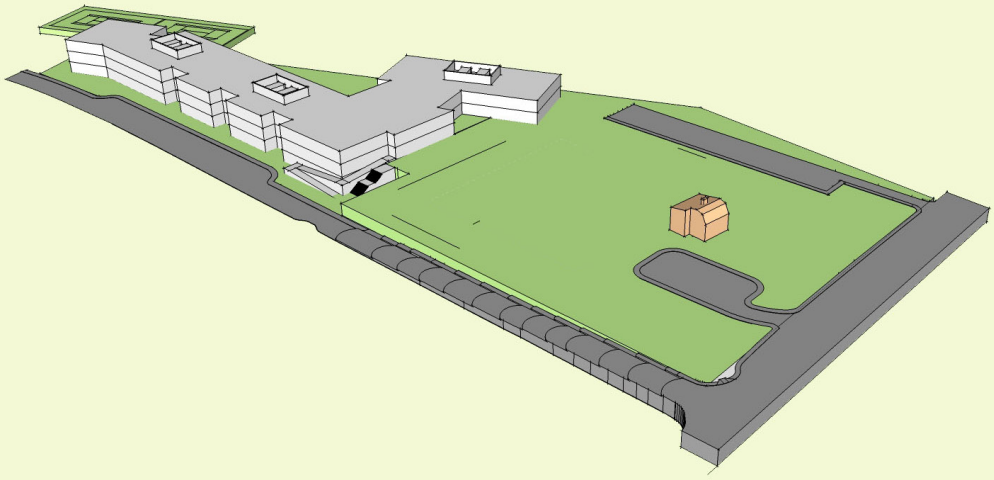


SECTION

Concept Diagrams - Option 3.1

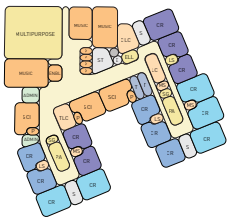
DEVOTION SCHOOL
Brookline, MA
3/7/14

- Administration
- Shared Spaces
- Circulation
- Mechanical
- Academic
- Classroom Cluster 1
- Classroom Cluster 2
- Classroom Cluster 3
- Special Education
- Toilets

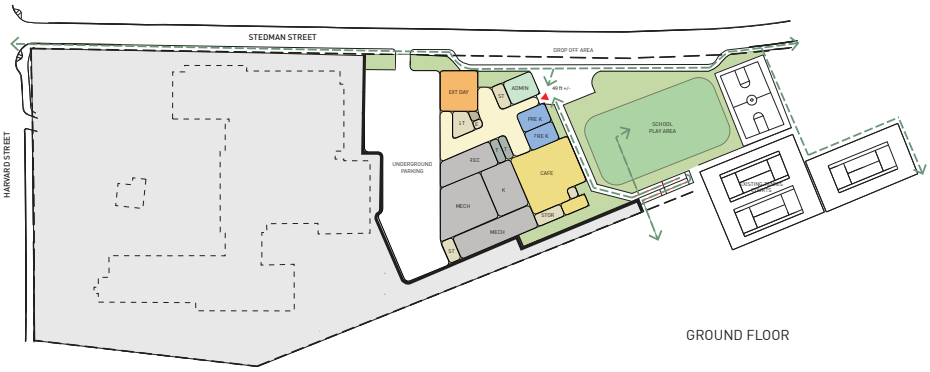


3.1

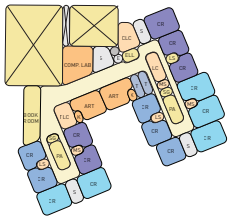
FIRST FLOOR



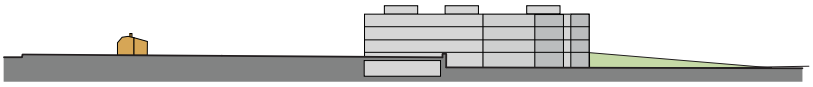
THIRD FLOOR



GROUND FLOOR



SECOND FLOOR



SECTION

DEVOTION SCHOOL
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- Administration
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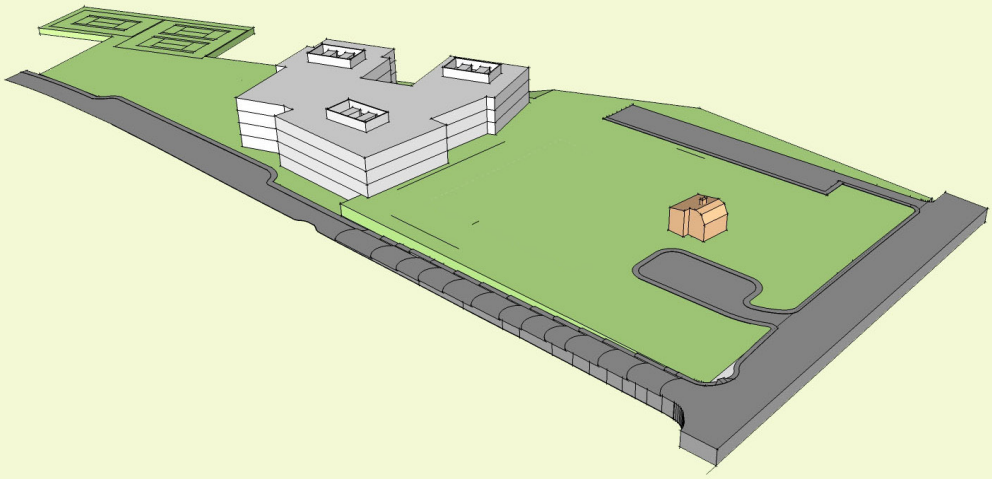
Concept Diagrams - Option 3.3



3.3

		Renovation with Additions					New Construction		
		Option 1.1	Option 1.2	Option 1.3	Option 1.4	Option 2	Option 3.1	Option 3.2	Option 3.3
Site Issues									
Historic Character	Devotion House remains as located	yes	yes	yes	yes	yes	yes	yes	yes
	1913 Building retained	yes	yes	yes	yes	yes	no	no	no
	1954 and 1974 wings retained	no	no	no	no	no	no	no	no
	Large trees near Devotion House retained	yes	yes	yes	yes	yes	yes, some (adversely impacted by athletic fields construction)	yes, some (adversely impacted by athletic fields construction)	yes, some (adversely impacted by athletic fields construction)
	Opportunity to restore original structure	yes	yes	yes	yes	yes	no	no	no
Urban Design	School Building Massing on Harvard Street (or less than existing distance of 245')	yes- less than existing	yes- less than existing	yes- less than existing	yes- less than existing	yes- less than existing	no	no	no
	School Building Massing on Stedman Street	yes - less than existing	no - less than existing	no - less than existing	no - less than existing	no - less than existing	yes	yes	yes
	Community Lawn maintained	yes	yes	yes	yes	yes	yes	yes	yes
	Public Seating area	yes	yes	yes	yes	no	yes	yes	no
Vehicular and Pedestrian Circulation	Main Entrance only on Stedman	no	no	no	no	no	no	no	no
	Main Entrance on both Stedman and Harvard Street	yes	yes	yes	yes	main entry on Stedman St.	yes	yes	yes
	Devotion Street pedestrian pathway maintained but flattened	yes	path relocated	yes	path relocated	path relocated	no	path relocated	yes
	Gathering spaces for parents and students near entrances	yes	yes	yes	yes	yes	Harvard St. entrance	yes	yes
	Bus Drop-Off	no	On Harvard St.	no	On Harvard St.	On Harvard St.	no	no	no
	Parent Drop-Off	On Stedman St.	On Stedman St.	On Stedman St.	On Stedman St.	On Stedman St.	On Stedman St.	On Stedman St.	On Stedman St.
	Public Parking	no	no	no	no	no	yes	yes	yes
	Garage Parking	yes	yes	yes	yes	yes	yes	yes	yes
	Loading Dock and Service Access w/Good adjacencies	yes	combined w/garage	combined w/garage	combined w/garage	combined w/garage	combined w/garage	yes but close to entry	combined w/garage
Site Programming/ Organization	Age-separated Play Space	yes	yes	yes	yes	yes	yes	yes	yes
	U9 Soccer Field	yes	yes, 2	yes	yes	yes	no	U9 or U11	U9
	U11 Soccer Field	no	no	no	no	yes	yes	U9 or U11	no
	Softball/Little League Field	no	no	no	no	yes	yes	yes	yes
	Basketball Courts	yes	1	2	2	2	no	no	1
	Outdoor Classroom	yes	yes	yes	yes	yes	yes	yes	yes
	Garden space	no	yes	yes	no	yes	yes	yes	no
	Play areas receive good sunlight	yes, most	yes	no	yes, half	yes	yes	yes	yes
	Play spaces set away from public walkways	no	yes, half	no	no for most, some yes	no for most, some yes	no for most, some yes	no	no
	Good visibility of outdoor space from building	Stedman St. outdoor space	yes	yes	yes	yes, some	yes, some	yes	yes
	Existing play space area compared with options --SF	slightly less	slightly less	slightly less	more	less	equal	slightly less	equal

Appendix I

Alternative Options Attribute Matrix

		Renovation with Additions					New Construction		
		Option 1.1	Option 1.2	Option 1.3	Option 1.4	Option 2	Option 3.1	Option 3.2	Option 3.3
Building Issues									
School Organization	Grade-level "clusters" - PK, K-2, 3-5, 6-8	yes	no	yes	yes	no	yes	yes	no
	Two K-8 Schools with shared common space	no	no	no	no	no	no	no	yes
Educational Programming	Specialists are located near grade-level classrooms	yes	yes	yes	yes	yes	yes	yes	yes
	Project areas adjacent to groups of classrooms	yes	yes	yes	yes	yes	yes	yes	yes
	No self-contained SPED classrooms - Therapeutic and Comprehensive Learning Centers located near classrooms	yes	yes	yes	no	yes	yes	yes	yes
	Large Library	yes	yes	no	yes	no	no	yes	no
	Library functions located within Project Area with small Book rooms	no	no	yes	no	yes	yes	no	yes
	Gym (2-station) and Small gym (1-station)	yes	yes	yes	yes	yes	yes	yes	yes
	Multi-purpose Room w/stage (Auditorium)	yes	yes	yes	yes	yes	yes	yes	yes
Adjacencies	Cafeteria adjacent to play areas	near	near	yes	near	near	yes	yes	yes
	Gymnasium spaces adjacent to athletic fields	no	near	no	near	yes	yes	near	yes
	Potential to open only part of school for community or after-hours use	yes	yes	yes	no	yes	yes	yes	no
	Art and Music rooms dispersed through school	yes	yes	yes	yes	yes	Music	Art	no
	Art and Music rooms adjacent to each other	no	no	no	no	no	Art	Music	yes
	Administration spaces adjacent to each other	no	no	no	no	no	no	no	no
	Administration spaces distributed throughout school	yes	yes	yes	yes	yes	yes	yes	yes
	Receiving and maintenance adjacent to loading area	yes	yes	yes	yes	yes	yes	no	yes
	Service elevator adjacent to receiving and maintenance area	yes	no	yes	no	yes	no	no	no
Phasing	School remains occupied while new school is built on site	no	no	no	no	no	yes	yes	yes
	Phase 1 - demolition of gym and renovation of Small Gym	yes	yes	yes	yes	yes	NA	NA	NA
	Phase 2 - construction of additions	yes	yes	yes	yes	yes	NA	NA	NA
	Phase 3 - demolition of 1954 wing	NA	NA	NA	yes	NA	NA	NA	NA
	Phase 4 - Construction of Classroom Addition	NA	NA	NA	yes	NA	NA	NA	NA
	Phase 5 - Demolition of 1974 wing	NA	NA	NA	yes	NA	NA	NA	NA
	Phase 6 - Demolition of 1954 and 1974 buildings	yes	yes	yes	NA	yes	NA	NA	NA
	Phase 7 - Demolition of 1913, 1954, and 1974 buildings	NA	NA	NA	NA	NA	yes	yes	yes
	Phase 8 - construction of structured parking	yes	yes	yes	yes	yes	yes	as part of new construction	as part of new construction
	Phase 9 - completion of site	yes	yes	yes	yes	yes	yes	yes	yes