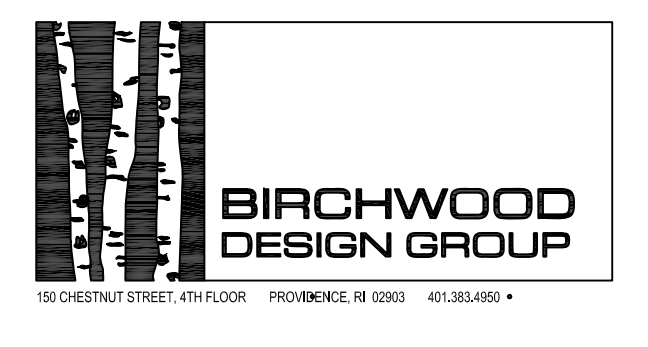
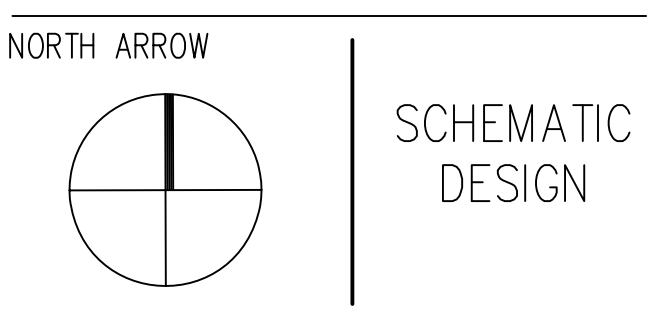


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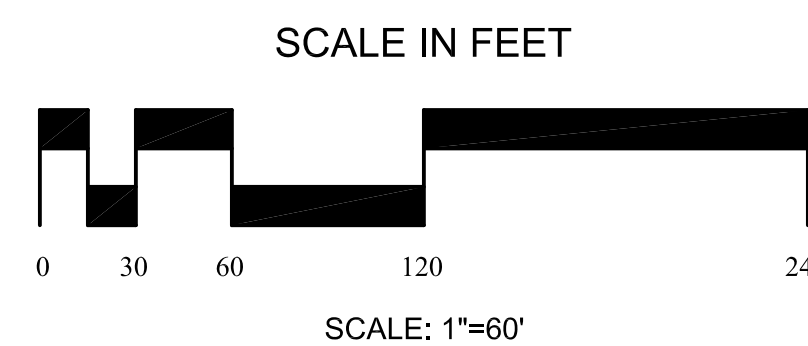
KENNEDY MIDDLE SCHOOL
165 MILL STREET
NATICK, MA 01760

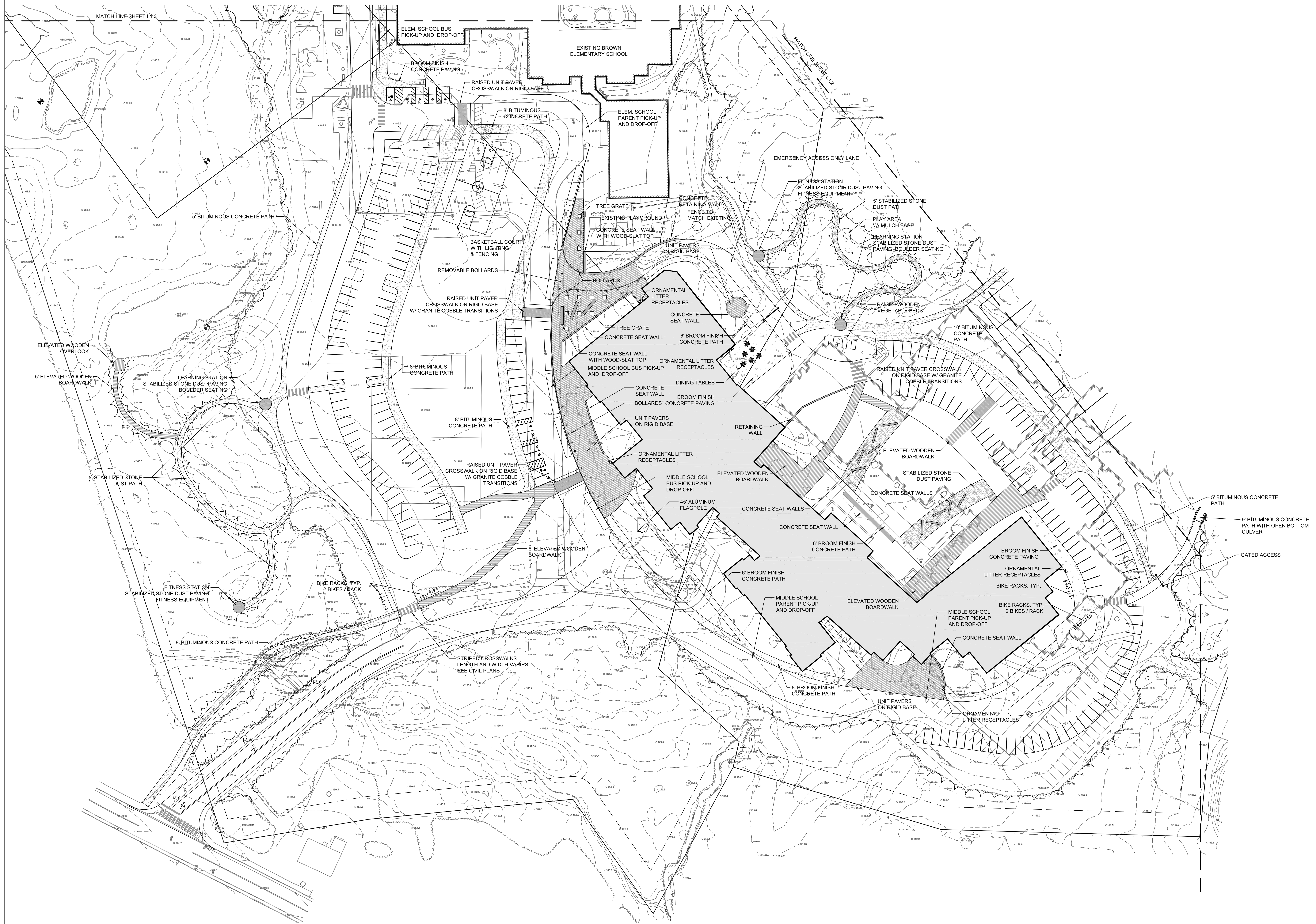
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KEYPLAN

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DRAWN BY:	EH
REVIEWED BY:	KB
SCALE:	AS NOTED DRAWING NUMBER:
JOB NO.: 1605.00	L1.0
DATE: DEC. 21, 2017	



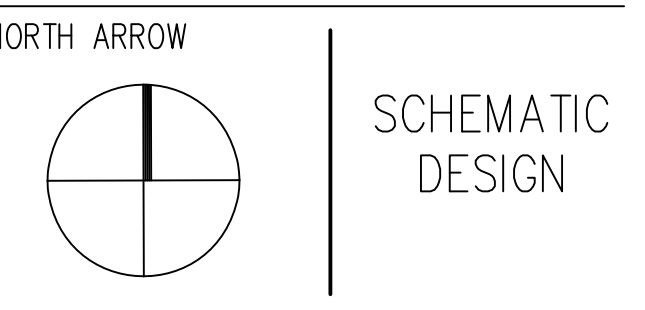


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KEYNOTE LEGEND:



KEYPLAN

DRAWING NAME:

HARDSCAPE
PLAN 1

DRAWN BY: EH

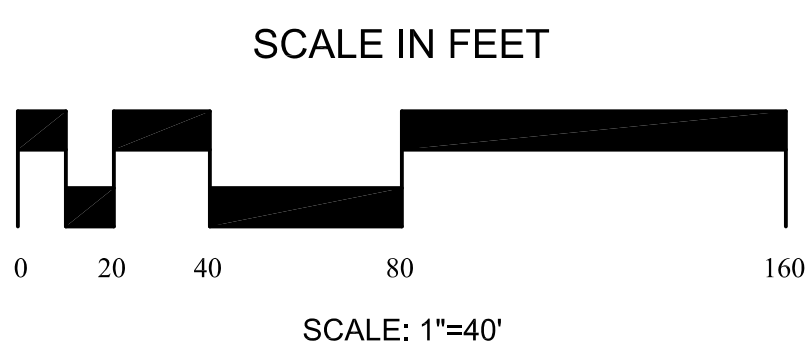
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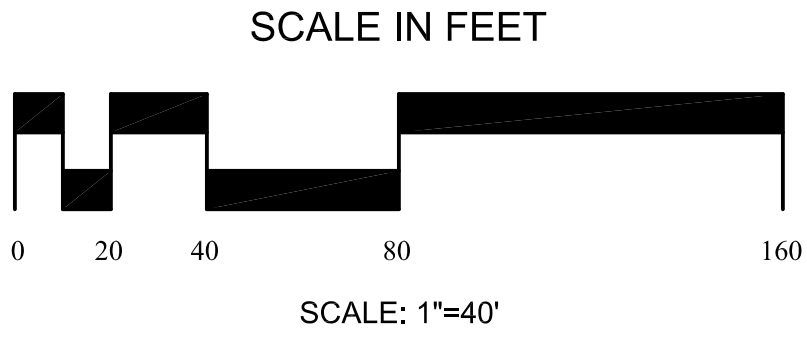
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DATE: DEC. 21, 2017

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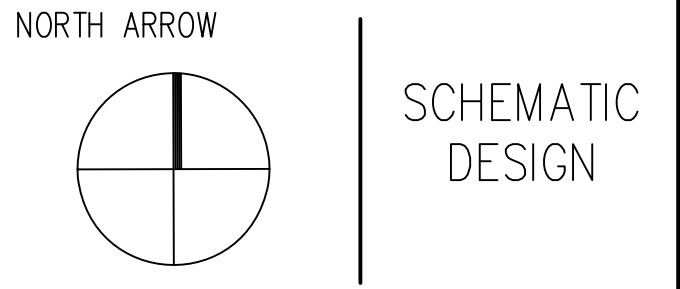


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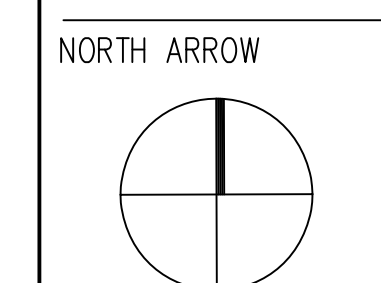
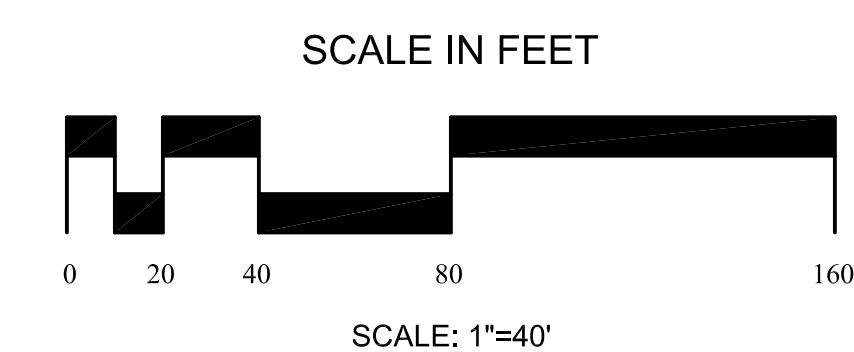
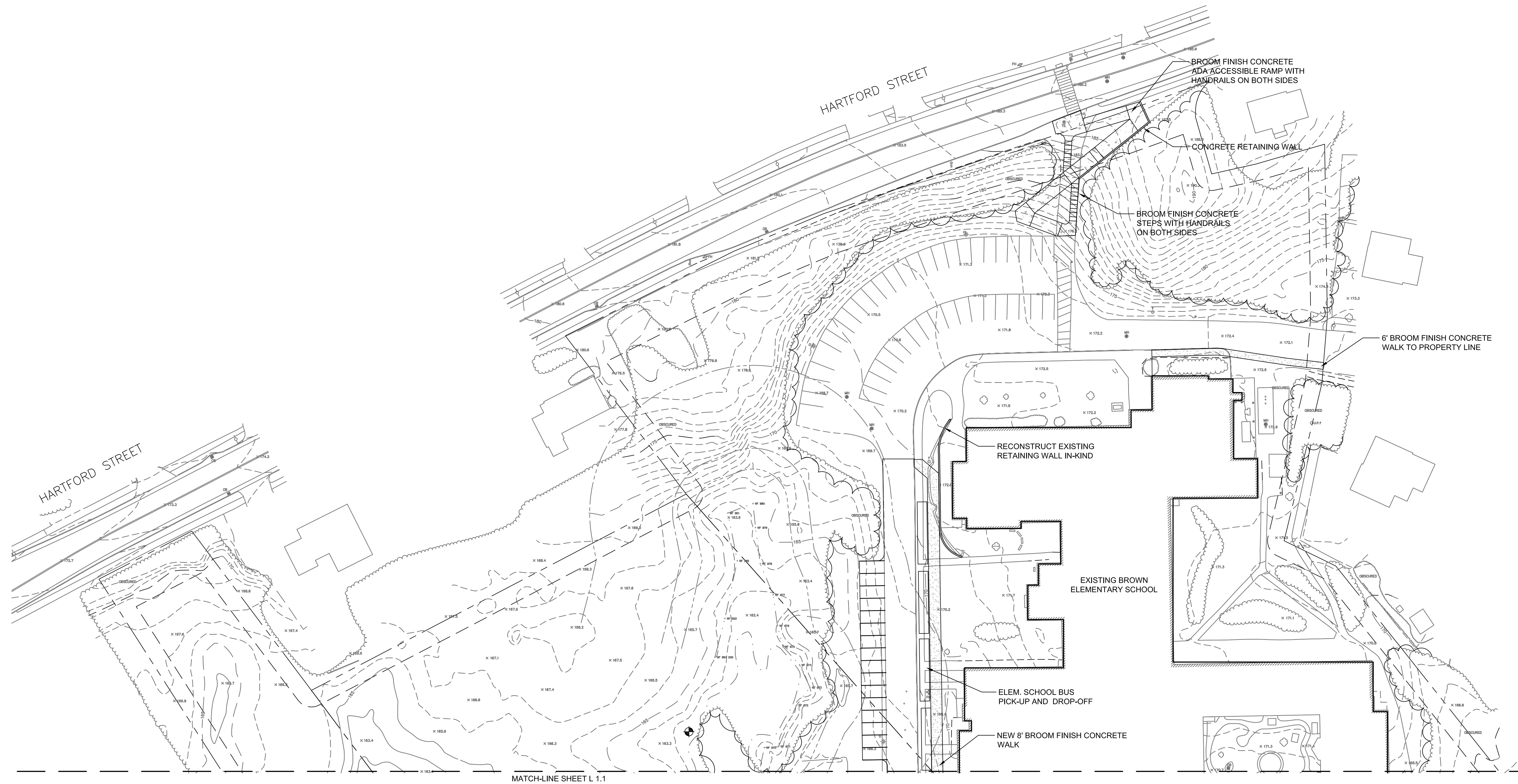
KENNEDY MIDDLE SCHOOL
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KEYNOTE LEGEND:



KEYPLAN

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DRAWN BY:	EH
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SCALE:	AS NOTED DRAWING NUMBER:
JOB NO.: 1605.00	L1.2
DATE: DEC. 21, 2017	



SCHEMATIC
DESIGN

KEYPLAN

DRAWING NAME:

**HARDSCAPE
PLAN 3**

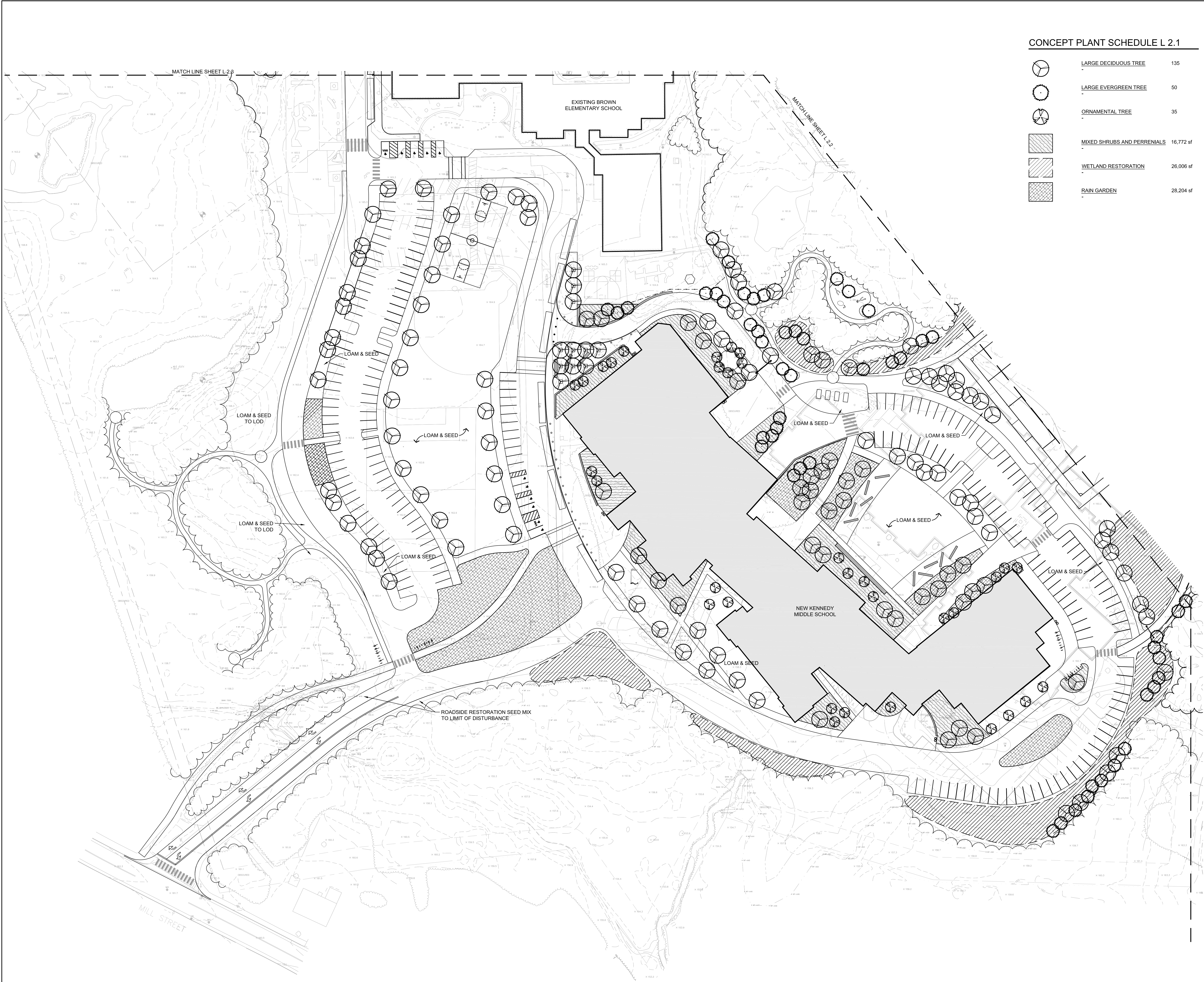
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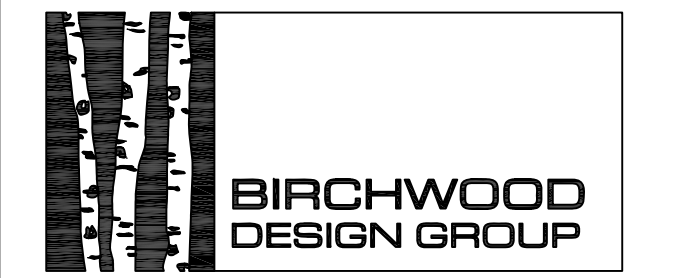


CONCEPT PLANT SCHEDULE L 2.1

	LARGE DECIDUOUS TREE	135
	LARGE EVERGREEN TREE	50
	ORNAMENTAL TREE	35
	MIXED SHRUBS AND PERENNIALS	16,772 sf
	WETLAND RESTORATION	26,006 sf
	RAIN GARDEN	28,204 sf

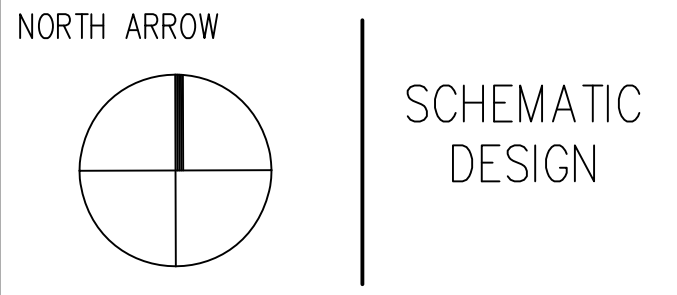


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KEYNOTE LEGEND:



KEYPLAN

DRAWING NAME:

LANDSCAPE
PLAN 1

DRAWN BY: EH

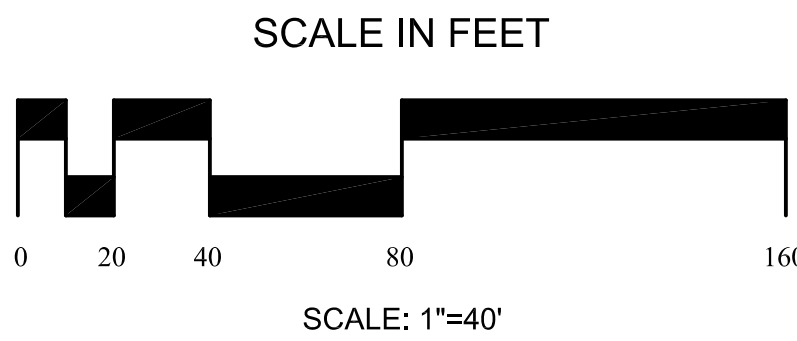
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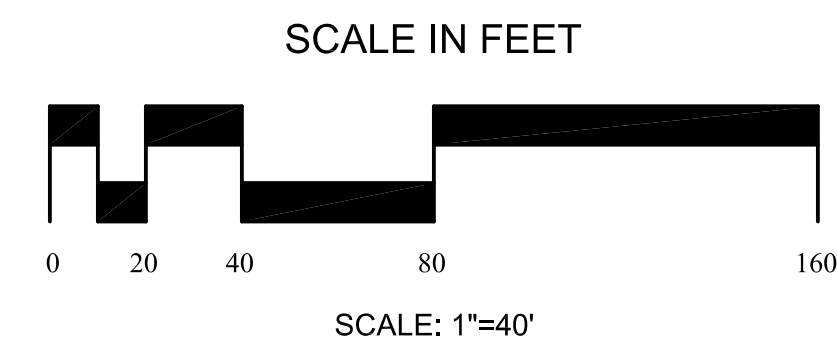
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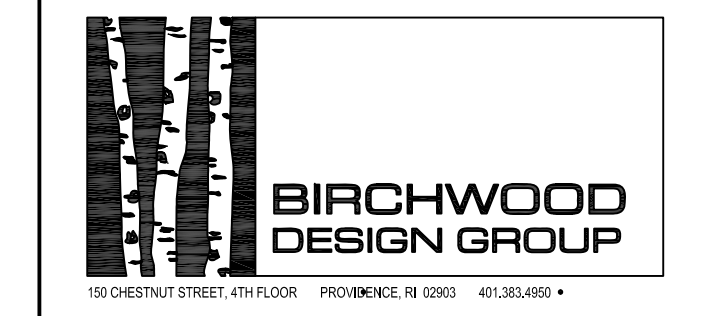


CONCEPT PLANT SCHEDULE L 2.2

	LARGE EVERGREEN TREE	11
	WETLAND RESTORATION	18,639 sf

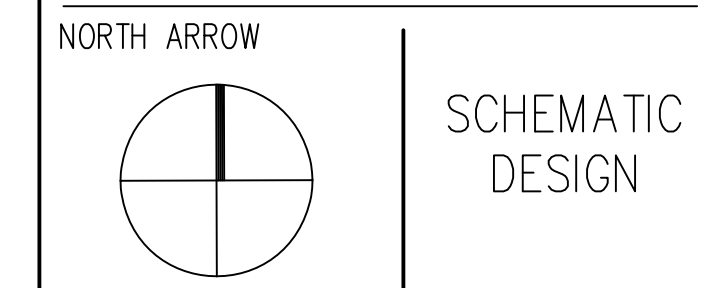


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KEYNOTE LEGEND:



KEYPLAN

DRAWING NAME:

LANDSCAPE
PLAN 2

DRAWN BY: EH

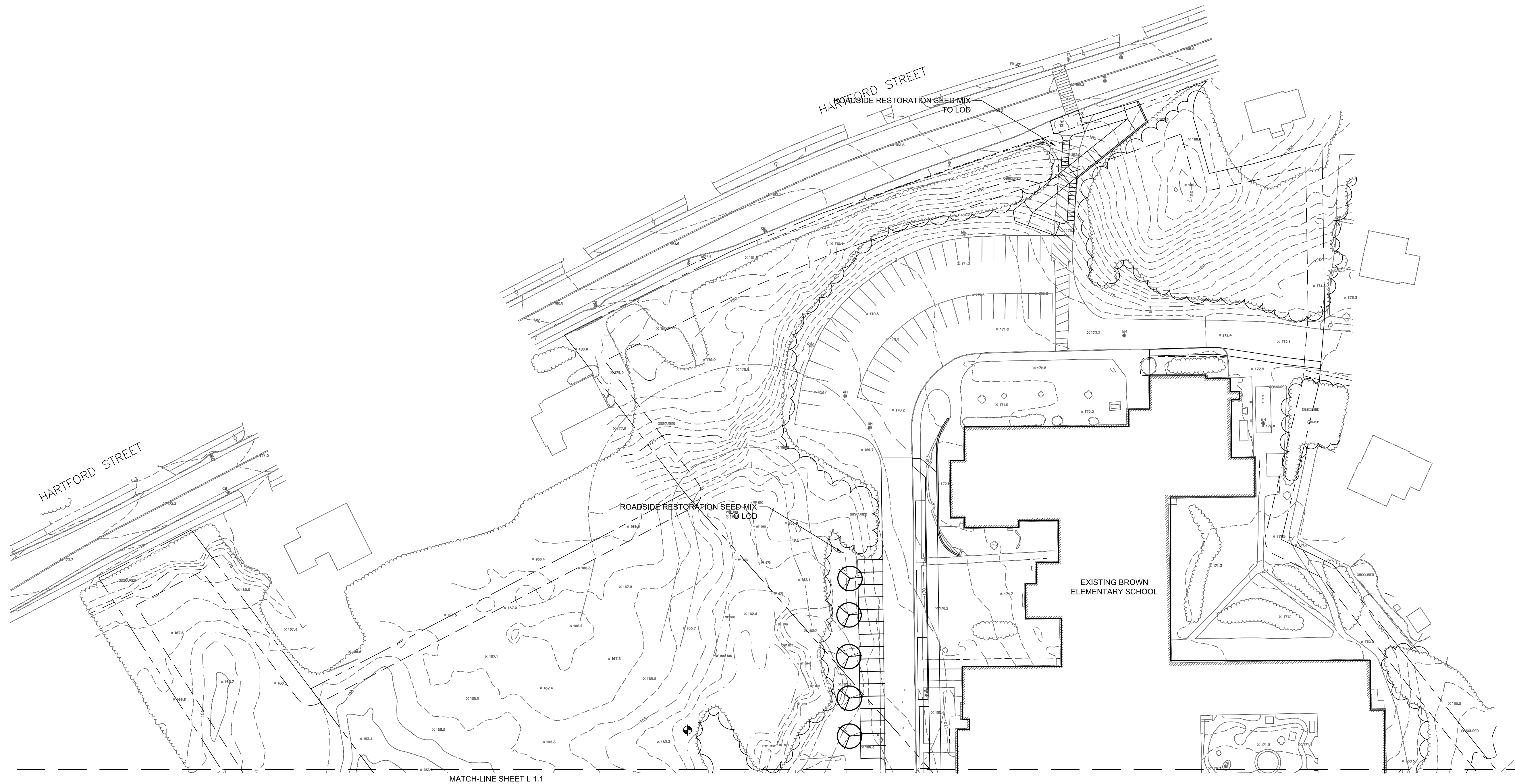
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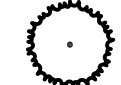
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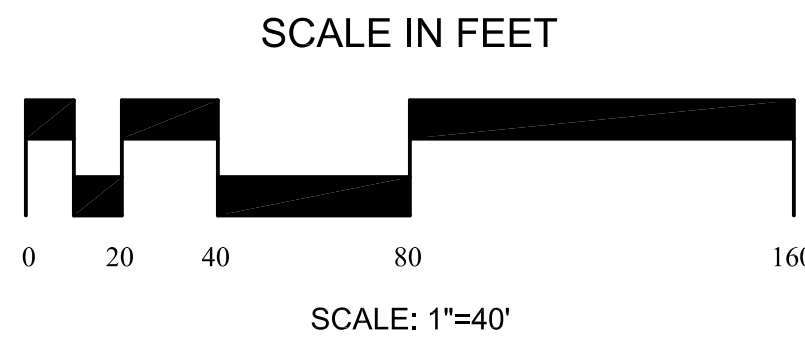
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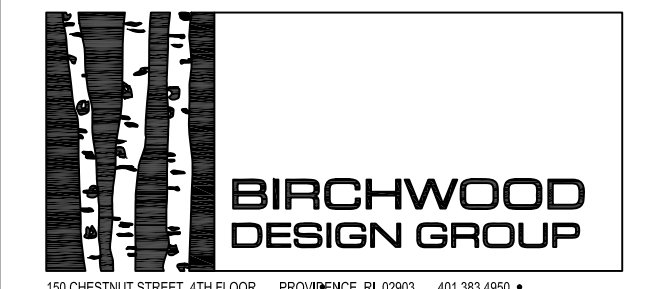


CONCEPT PLANT SCHEDULE L 2.3

-  LARGE DECIDUOUS TREE 15
-  LARGE EVERGREEN TREE 9



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KEYNOTE LEGEND:

NORTH ARROW



SCHEMATIC DESIGN

KEYPLAN

DRAWING NAME:

LANDSCAPE PLAN 3

DRAWN BY: EH
REVIEWED BY: KB

SCALE: AS NOTED | DRAWING NUMBER: L2.3
JOB NO.: 1605.00
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4 FOURTH FLOOR - OVERALL PLAN
1" = 40'-0"

5 THIRD FLOOR - OVERALL PLAN
1" = 40'-0"

2 SECOND FLOOR - OVERALL PLAN
1" = 40'-0"

1 FIRST FLOOR - OVERALL PLAN
1" = 40'-0"

BUILDING CODE ANALYSIS

KENNEDY MIDDLE SCHOOL
Ai3 Architects, LLC - Project # 1605.00

Massachusetts State Building Code - 780 CMR: 9th Edition (2015 International Building Code w/ Massachusetts Amendments)

Programmed Student Population
Programmed Staff Population

1,000
100 persons
persons

****NOTE: The outline below indicates specific code sections intended for ease of reference to the Construction Documents and is NOT intended as a complete code analysis document.**

A. SCHOOL BUILDING CODE ANALYSIS

Chapter 3: Use and Occupancy Classification
Section 302 Return:
- 302.2 Assembly Group A-1 (Auditorium)
- 302.3 Assembly Group A-2 (Student Commons/Dining)
- 302.4 Assembly Group A-3 (Library Media Center)
- 302.5 Assembly Group A-4 (Gymnasium)
- 302.1 Use Group Classification
- 311.3 Low-Hazard Storage Group S-2 (Mechanical, electrical and technology rooms)

Chapter 4: Special Detailed Requirements Based on Use and Occupancy

Section 404 Return:
- 404.6 Erection of Stairs: Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 711 or both.
Section 410 Return:
- 410.3.3 Pressurized Wall: If stage height is less than 10 feet, a pressurized wall is not required. Designated Stage Height is 38 feet.
- 410.3.3 Pressurized Curtain: Pressurized wall and stage curtain pressurized wall is not required.
- 410.3.7.1 Roof Vents: Stage area is 1750 sq. ft. (Roof Vents not required in stage area is less than 1000 sq. ft.). Roof Vents provided for stage ventilation.

Chapter 5: General Building Heights and Areas

Table 504.1 Allowable Building Height in Feet Above Grade Plane
Type IIA Construction (B, B and E occupancy): 85 foot limit 54 feet designed
Table 504.4 Allowable Number of Stories Above Grade Plane
Type IIA Construction (A-1, A-2, A-3 and E occupancy): 4 story limit 4 stories designed
Table 506.2 Allowable Area Factor in Square Feet
Type IIA Construction (A-1, A-2 and A-3 occupancy): 42,000 SF
Type IIA Construction (E occupancy): 70,000 SF
*Area increase factors listed below

		Allowable area for fully sprinkled, Type IIA building (SF)	Allowable area for non-sprinkled, Type IIA building (SF)	Allowable Area (SF)
Education	E	70,000	21,000	86,125
Auditorium	A-1	42,000	14,000	52,500
Student Dining	A-2	42,000	14,000	52,500
Library/Media Center	A-3	42,000	14,000	52,500
Gymnasium	A-4	42,000	14,000	52,500
Mech. Elec. MHF	S-2	117,000	39,000	146,250

	Occupancy Classification	Actual Area (SF)	Allowable Area (SF)	Ratio (Actual/Allowable)
FLOOR 1	Education	14,560	86,125	0.167
	Auditorium	1,500	52,500	0.029
	Student Dining	2,350	52,500	0.045
	Library/Media Center	4,900	52,500	0.093
	Mech. Elec. MHF	1,800	146,250	0.012
	Total	36,510	230,925	0.158
FLOOR 2	Education	14,560	86,125	0.167
	Auditorium	1,500	52,500	0.029
	Student Dining	2,350	52,500	0.045
	Library/Media Center	4,900	52,500	0.093
FLOOR 3	Education	14,560	86,125	0.167
	Auditorium	1,500	52,500	0.029
	Student Dining	2,350	52,500	0.045
	Library/Media Center	4,900	52,500	0.093
FLOOR 4	Education	14,560	86,125	0.167
	Auditorium	1,500	52,500	0.029
	Student Dining	2,350	52,500	0.045
	Library/Media Center	4,900	52,500	0.093
TOTAL OF ALL FLOORS		146,250	2,271	0.064

Table 509: Incident Uses

Furnace room where any piece of equipment is over 400,000 BTU per hour input. Automatic sprinkler system provided.
In group E occupancy, laboratories and associated design and drafting studios in Group E occupancy, automatic sprinkler system provided.

Chapter 4: Types of Construction

Table 601: Fire Resistance Rating Requirements for Building Elements

Primary Structural Frame, Boasting Walls, Nonbearing Walls, Floor Construction and Roof Construction elements are rated for Type IIA Construction and Type IIB Construction as identified in the chart below.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

Building Element	Type III
Primary structural frame (see Section 202)	A
Boasting Walls	2
Exterior	1
Interior	1
Nonbearing walls and partitions	See Table 602
Exterior	0
Interior	0
Floor construction and associated secondary members	1
One-Section 202	1
Floor construction and associated secondary members	1
One-Section 202	1

Chapter 7: Fire and Smoke Protection Features

Section 701: Fire Resistance Rating and Fire Tests

701.2 Marking and Identification: Where there is an accessible concealed floor, roof ceiling or attic space, the walls, the barriers, the partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:
a. Be located within 15 feet (4.57 m) of the end of each wall and at intervals not exceeding 30 feet (9.14 m) measured horizontally along the wall or partition.
b. Include listing not less than 3 inches (76 mm) in height with a minimum 3/8 inch (9.5 mm) stroke in a contrasting color incorporating the suggested wording, "FIRE AND/OR SMOKE BARRIER. PROTECT ALL OPENINGS," or other wording.

Section 706: Fire Walls

Table 706.1: Fire Walls shall have a fire resistance rating of not less than 2 hours fire resistance rating.
a. In Type I construction, walls shall be permitted to have a 2-hour fire resistance rating.
b. 706.5.1 Exterior Walls: Where the fire resistance rating of the exterior walls shall comply with one of the following:
1. The exterior walls on both sides of the fire wall shall have a 2-hour fire resistance rating with 3/4-hour protection where opening protection is required by Section 705.6. The fire resistance rating of the exterior wall shall not be less than 1 hour (1.20 m) on each side of the intersection of the fire wall and exterior wall. Exterior wall intersections of the walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.
2. Building or other walls that intersect the fire wall shall be permitted to have an opening for fire at the fire wall and extending beyond the exterior of the fire wall. The location of the assumed fire in relation to the exterior wall and the fire wall shall be such that the exterior wall and opening protection meet the requirements set forth in Sections 705.5 and 705.6. Such protection is not required for exterior walls terminating at the fire wall that form an angle equal to or greater than 180 degrees (3.14 rad).

Section 707: Fire Barriers

707.6 Openings: Openings in a fire barrier shall be protected in accordance with Section 716. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (14.4 m²). Openings in enclosures for exit access stairways and ramps, exterior exit stairways and ramps and exit passageways shall comply with Sections 1019, 1023.4 and 1024.5, respectively.
Exceptions:
1. Openings shall not be limited to 156 square feet (14.4 m²) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Section 711: Shaft Enclosures

711.2 Construction: Shaft enclosures shall be constructed in accordance with Section 707 or horizontal assemblies in accordance with Section 711, in both.
711.4 Fire Resistance Rating: Shaft enclosures shall have a fire resistance rating of not less than 2 hours where connecting floor slabs or more, and not less than 1 hour where connecting less than four slabs. The number of doors connected by the shaft enclosure shall include any basement, but not any mezzanine. Shaft enclosures shall have a fire resistance rating not less than the fire assembly permitted, but need not exceed 2 hours.
711.1.1 Endwalls of the Shafts: Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:
1. They shall be enclosed at the lowest level with construction of the same fire resistance rating as the base floor through which the shaft passes, but not less than the rating required for the shaft enclosure.
2. They shall terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by the barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, in both. The fire resistance rating and opening protection shall be not less than the protection required for the shaft enclosure.
3. They shall be protected by approved fire dampers installed in accordance with their listing at the lowest floor level within the shaft enclosure.
Exceptions:
1. The fire resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom shall be at or level of ground the penetrating item with materials permitted by Section 718.3.1 for drapery, or the room shall be protected with an approved automatic sprinkler system.
2. A shaft enclosure containing a waste or clean drain shall not be used for any other purpose and shall discharge in a room protected in accordance with Section 712.11.4.
3. The fire resistance-rated room separation and the protection at the bottom of the shaft shall be not required provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.
711.1.2 Enclosure at the Top: A shaft enclosure that does not extend to the underside of the roof sheathing, deck, or slab of the building shall be enclosed at the top with construction of the same fire resistance rating as the tapered roof penetration by the shaft, but not less than the fire resistance rating required for the shaft enclosure.

Section 714: Opening Protection

714.5 Fire Door and Shelter Assemblies: Approved fire door and shelter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 715.5.1, 715.5.2 or 715.5.3, and the protection rating indicated in Table 714.5. Fire door frames with transoms lights, sidelights or both shall be permitted in accordance with Section 715.5.6. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.
Exceptions:
1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for fire-rated door assemblies.
2. Fire door assemblies in accordance with Section 712.1.1.3.
714.5.5 Doors in Interior Exit Stairways and Ramps and Exit Passageways: Fire door assemblies in interior exit stairways shall have a maximum transmitted temperature rise of not more than 450°F (232°C) above the ambient air in the exit of 30 minutes or longer for the test exposure.
Exception:
The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Section 716: Fire Doors

716.5.1 Rating in Doors: Fire protection-rated glazing in excess of 100 square inches (6,461 cm²) is not permitted. Fire resistance-rated glazing in excess of 100 square inches (6,461 cm²) shall be permitted in fire doors. Labeled fire resistance-rated glazing tested as an assembly in accordance with ASTM E 119 or UL 253 shall be permitted where a fire protection rating exceeding 3/4 hour is required in accordance with Table 714.5.
716.5.6 Fire Door Frames with Transoms Lights and Sidelights: Door frames with transoms lights, sidelights or both, shall be permitted where a 3/4-hour fire protection rating or less is required in accordance with Table 714.5. Fire door frames with transoms lights, sidelights or both, shall be permitted where a fire resistance-rated glazing tested as an assembly in accordance with ASTM E 119 or UL 253 shall be permitted where a fire protection rating exceeding 3/4 hour is required in accordance with Table 714.5.

Section 718: Concealed Spaces

718.3 Combustible Materials in Concealed Spaces in Types I and II Construction: Combustible materials shall not be permitted in concealed spaces of buildings of Type I or II construction.
Exception: Combustible materials in accordance with Section 603.

Chapter 15: Roof Assemblies and Rooftop Structures

Section 1501: Fire Classification

Table 1501.1 Minimum Roof Covering Classification for Types of Construction
Type IIA Construction requires class I roof assemblies.
- 1501.3 Class II Roof Assemblies: Class II roof assemblies are those that are effective against moderate fire-test exposure. Class II roof assemblies and roof coverings shall be listed and identified as Class II by an approved testing agency.

B. FIRE PROTECTION SYSTEM

Chapter 9: Fire Protection Systems

Section 902: Automatic Sprinkler Systems

902.2 Exception: Automatic sprinkler systems shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system and notification in accordance with Section 907 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is exempt from the fire resistance-rated construction or contains electrical equipment.
(b) Machine rooms of freestanding hydraulic elevators, elevator hoistways, or elevator pits. Such elevator machine rooms, hoistways, or pits shall be constructed to meet the fire resistance rating specified in Table 601 and otherwise as required by the applicable sections of Chapter 7, where Table 601 requires a higher fire resistance rating for elevator machine rooms, hoistways, or pits, such rating must be provided unless such ratings are governed by other sections of the code.

C. ELECTRICAL ROOM FIRE RATING

NFPA 70

Section 1511.1 Electrical Equipment
- 1511.1.3 Sprinklers: shall not be required in electrical equipment rooms where all of the following conditions are met:
1. The room is dedicated to electrical equipment only.
2. Only dry-type electrical equipment is being used.
3. Equipment is installed in a 2-hour fire-rated enclosure including protection for penetrations.
4. No combustible storage is permitted to be stored in the room.

Main Electrical Room (M) 4 conditions are met: Automatic water sprinkler system not required.
Emergency Electrical Rooms (EM) 4 conditions are met: Automatic water sprinkler system not required.
Secondary Electrical Rooms (SE) 4 conditions are met: Automatic water sprinkler system not required.

D. MEANS OF EGRESS

Chapter 10: Means of Egress

Section 1002: Means of Egress Rating
Table 1006.1.2 Maximum Floor Area Allowance Per Occupant

Assembly - Auditorium	500 (4th floor seats + 4 accessible spaces)
Stage - Auditorium	1 occupant per 15 sq ft
Assembly - Student Dining	1 occupant per 15 sq ft
Assembly - Conference Rooms	1 occupant per 15 sq ft
Assembly - Classroom	1 occupant per 15 sq ft
Locker Rooms	1 occupant per 50 sq ft
Business Areas	1 occupant per 100 sq ft
Classroom	1 occupant per 100 sq ft
Vocational Area	1 occupant per 50 sq ft
Library - Reading Room	1 occupant per 50 sq ft
Library - Stack Area	1 occupant per 100 sq ft
Mechanical / Storage Rooms	1 occupant per 300 sq ft
Kitchen	1 occupant per 200 sq ft

E. EXITS

Chapter 10: Means of Egress

Section 1002: Means of Egress Rating
- 1002.3 Required Capacity Based on Occupant Load - Reference diagrams and floor plans, drawings G2-02 - G2-05 Fire Safety Plans

Table 1006.2: Spaces with One Exit or Exit Access Doorway
Occupancy Group E: Maximum Occupant Load of Space - 49
Maximum Common Path of Egress Travel Distance - 75 feet

Table 1006.3: Minimum Number of Exits of Access to Exits Per Story

1,000 Occupants	1 Exit
More than 1,000 Occupants	4 Exits

Table 1017.2: Exit Access Travel Distance
Occupancy Groups A & E: 250 feet with sprinkler system

Table 1020.1: Corridor Fire-Resistance Rating
Occupancy Groups A & E: 0 hours with sprinkler system

- 1020.4 Dead ends: Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet.
2. In occupancies in Group E where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet.

F. PLUMBING FIXTURES AS REQUIRED FOR SCHOOL BUILDING

Educational Use (Secondary)

Plumbing Code 248 CMR Section 10.10(10) Table 1

Programmed Student Population: 1,000 Persons

ALL FLOORS	Required	Designated
Drinking Fountains	1 per 15 - 1	15
Water Closets	1 per 90 - 4	15
Urinals	1 per 90 - 4	15
Water Closets	1 per 90 - 4	15
Urinals	1 per 90 - 4	15

Programmed Staff Population: 100 Persons

ALL FLOORS	Required	Designated
Water Closets	1 per 20 - 2	7
Urinals	1 per 40 - 2	7
Water Closets	1 per 20 - 2	7
Urinals	1 per 40 - 2	7

Handicapped Unisex Toilet Room fixtures provided in addition to those required in the following rooms:
Table 1011: Table 1020: Table 1021: Table 1022: Student Toilet 1025: Student Toilet 1026: ACCESS
Classroom Table 1034: Table 1046: Table 1028: Student Toilet 1205: Student Toilet 1206: Student Toilet 1405: ACCESS Classroom Table 1406: ACCESS Classroom Table 1406

Programmed Student and Staff Population: 1,100 Persons

ALL FLOORS	Required	Designated
Drinking Fountains	1 per 15 - 1	15
Service Sinks	1 per floor	4
Auditorium: 500 seats		
Water Closets	1 per 20 - 2	7
Urinals	1 per facility	3

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Gymnasium: 250 seats

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Kitchen: (Designated fixture count from Table 174.5)

248 CMR Section 10.10(10) paragraph 10 Item 5

which shall comply with the requirements of 248 CMR 10.10(10) paragraph 10 Item 1.5.

248 CMR Section 10.10(10) paragraph 10 Item 2

Unisex toilet facilities may be allowed if they meet the requirements of 248 CMR 10.10(10) paragraph 10

Unisex: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Men: 1 per 400 - 1

Water Closets: 1 per 200 - 2

Urinals: 1 per facility

Women: 1 per 200 - 2