# Schematic Design
# Pricing Set
# Outline Specification

**February 15, 2019**

# Baldwin School Expansion

**Brookline Massachusetts**

**Jonathan Levi Architects**
266 Beacon Street
Boston, Massachusetts 02116

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## SECTION 011000 - SUMMARY

1. Project Identification and Description of Work

   a. Project Identification: The name of the Project on Contract Documents is "Baldwin School", located in Brookline, Massachusetts.

2. Description: Project consists of constructing a new School for grades Pre-K through 8 in Brookline, MA.

3. Phased landscape development, paving, site utility work, and other site improvements are required as part of the Work.

4. Existing Baldwin School building hazardous materials abatement and building demolition are required as part of the Work.

5. Project shall have early bid packages for Demolition site preparation and site preparation.

6. Project shall achieve at minimum a LEED for Schools V4 Silver rating.

7. Project shall shall use Construction Manager at Risk project delivery method.

-END OF SECTION-

**SECTION 011001 – Project Schedule**

1. Building Abatement and Demolition

| | |
|---|---|
| Start Work | 3/1/20 |
| Substantial Completion | 9/1 /20 |

2. Package No. 2 – Site prep

| | |
|---|---|
| Award | 9/1/20 |
| Substantial Completion | 11/1/20 |

3. Package No. 3 - Building Construction

| | |
|---|---|
| Award | 12/1/20 |
| Substantial Completion | 6/15/2022 |

-END OF SECTION-

ENGINEERS & ENVIRONMENTAL PROFESSIONALS

February 17, 2017 EndPoint Project 2475-001

Philip Gray VIA EMAIL
Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116
*pgray@leviarc.com*

**Re:** Asbestos Survey – Visual Only
Baldwin School and Soule Recreation Center
484/490 Heath St., 654 Hammond St., and 650 Hammond St.
Brookline, Massachusetts

Dear Mr. Gray,

EndPoint, LLC (EndPoint) has prepared this report documenting our visual inspection services for asbestos containing building media at the Baldwin School building, Soule Environmental Education building, and the Soule Gymnasium, located at 484/490 Heath Street, 654 Hammond Street, and 652 Hammond Street, respectively, in the Chestnut Hill neighborhood of Brookline, MA (the Subject Property). This work was conducted based on our proposal and your authorization to proceed (via email). The asbestos survey was conducted to identify if suspected asbestos containing materials (ACMs) were present in the Subject Property's Baldwin School building, Soule Environmental Education building, and the Soule Gymnasium. Any suspect ACMs would be treated as if they were asbestos-containing and would require abatement activities prior to or management of planned renovations at the above-mentioned Subject Property, in accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAPs) Regulations.

## ASBESTOS SURVEY

On December 27, 2016 Ms. Katie Snyder and Ms. Sara Knowles of EndPoint, Asbestos Hazard Emergency Response Act (AHERA) accredited and Massachusetts certified Asbestos Inspectors (AI900553 and AI900693, respectively), were on site to conduct a survey of the Subject Property. Based on our correspondence with you and an understanding that the buildings are still in use, bulk samples of building materials suspected of containing asbestos were not collected from any of the three buildings, in order to preserve the integrity and aesthetic appeal of the properties. A visual inspection of each of the three buildings was conducted. Because samples were not collected, building materials that would typically be sampled due to them possibly containing asbestos were deemed suspect asbestos-containing building

materials (ACBM). It should be noted that all suspect ACBM observed in each of the three buildings were noted to be intact and well maintained.

An ACBM is defined in Massachusetts as any building material within a school building that contains asbestos at a concentration greater than or equal to 1% by weight. As discussed above, because bulk samples of building materials were not collected, and therefore not analyzed, these materials are considered "Suspect" ACBMs until bulk samples are collected and analyzed, and based on the analyses, the materials are determined to not contain asbestos.

*Baldwin School*

Based on historical asbestos inspections conducted at the Baldwin School, it was determined that wall and ceiling plaster at the property is already known to likely contain asbestos. This material was observed in each of the classrooms, offices, bathrooms, storage rooms and hallways. Please refer to the attached photographic log for selected pictures of locations throughout the properties where known and suspected ACBMs were identified.

Building materials that are considered to be suspect ACBM are identified below:

Exterior:

- Roofing materials on building (adhesive on clay shingles, asphalt shingles, tar, sublayers, etc.). – Approximately 7,000 square feet (SF).
- Roofing materials on detached sheds (asphalt shingles, tar, sublayers, etc.). – Approximately 100 square feet (SF)
- Window caulking and glazing – Approximately 80 windows (and door windows) of various shapes and sizes.

Interior:

- Ceiling and wall plaster was observed throughout the property, on each floor. Plastered walls and ceilings were observed to be intact and well maintained, and in some areas, labeled as ACBM (see photograph). – Approximately 12,100 SF.
- White ½" floor tiles were observed in the bathrooms on the 1st floor. The associated mastic and grout are also suspected ACBM. Floor tiles were observed to be intact, and no visible mastic was noted. – Approximately 300 SF.
- White 4" wall tiles were observed in the bathrooms and water-fountain areas on the 1st floor. The associated mastic and grout are also suspected ACBM. Wall tiles were observed to be intact, and no visible mastic was noted. – Approximately 750 SF.

- Tan 9”x9” floor tiles were observed in the 1st Floor Kitchen and underneath the carpet in the Classroom/Lunchroom and Lounge. The associated mastic is also suspected ACBM. Tiles were observed to be intact, and no visible mastic was noted. – Approximately 1,400 SF.
- Beige 12”x12” floor tiles were observed in the 1st Floor Classroom/Lunchroom and Classroom/Library. The associated mastic is also suspected ACBM. Tiles were observed to be intact, and no visible mastic was noted. – Approximately 1,000 SF.
- Red/Brown 4”x4” floor tiles were observed in the 1st floor entryways to the building (front and side). The associated grout and mastic are also suspected ACBM. Tiles were observed to be intact, and no visible mastic was noted. – Approximately 75 SF.
- Blue and Green carpeting was observed in the 1st floor Classrooms, Offices, and Hallway. The associated mastic is also suspected ACBM. Carpet was observed to be intact, and no visible mastic was noted. – Approximately 2,000 SF.
- White wainscoting was observed in the 1st floor bathroom. The wood wainscoting is not a suspect ACBM; however, the associated mastic is. Wainscoting was observed to be intact, and no visible mastic was noted. – Approximately 150 SF.
- Tan Flooring (linoleum or sealed tiles) was observed in Basement Classrooms, Classroom/Nap Room, Bathroom, and Hallway. The associated mastic is also suspected ACBM. The flooring was observed to be intact, and no visible mastic was noted. – Approximately 1,600 SF.
- Blue carpeting was observed in the Basement Activity Room, Office, Classrooms, and Hallway. The associated mastic is also suspected ACBM. Carpet was observed to be intact, and no visible mastic was noted. – Approximately 1,800 SF.
- Blue- and white-painted 12”x12” acoustical ceiling tiles were observed in the Basement Activity Room. The tiles are reportedly cemented to the ceiling; therefore, the adhesive/cement is also suspected ACBM. The ceiling tiles were observed to be intact, and no visible adhesive/cement was noted.
- Fire Doors were observed in the boiler room of the building, at the entrances to each of the surrounding rooms. Fire doors were labeled as being ACBM (see photographs) – Approximately two 10’x3’ doors, one 15’x6’ door, and one 2’x3’ door.
- Pipe Fitting Insulation (joints and elbows) on fiberglass-insulated pipes was observed in the attic and boiler room. This material is also assumed to be located behind walls and above ceilings. The fittings that were able to be observed were noted to be intact. – Approximately 200 LF.

The aforementioned Suspect ACMs were observed to be in good condition (intact), except where noted above. The Suspect ACMs will need to be removed as part of future asbestos abatement activities prior to any renovation or demolition projects affecting said materials; unless bulk samples are collected and analyzed, and based on the analysis, the materials are determined to not contain asbestos.

*Soule Environmental Education Center*

Building materials that are considered to be suspect ACBM are identified below:

Exterior:

- Roofing materials on building and detached sheds (asphalt shingles, rolled roofing, tar, sublayers, etc.). – Approximately 1,300 SF.
- Roofing materials on detached sheds (asphalt shingles, rolled roofing, tar, sublayers, etc.). – Approximately 25 SF.
- Stucco/Cementitious Siding was observed on the exterior of the building and intact. – Approximately 450 SF.

Interior:

- Tan 12"x12" floor tiles were observed in RM1. The associated mastic is suspected ACBM. Floor tiles were observed to be intact, and no visible mastic was noted. – Approximately 400 SF.
- Tan cove base was observed in RM1, RM2, RM3, and the Hall. The associated mastic is also suspected ACBM. Cove base was observed to be intact, and no visible mastic was noted. – Approximately 60 SF.
- Light green wallboard and joint compound was observed in RM1, RM2, RM3, and the Hall. Walls were observed to be intact. – Approximately 1,700 SF.
- White wallboard and joint compound was observed on the ceilings in RM1, RM2, RM3, and the Hall. Ceilings were observed to be intact. – Approximately 700 SF.
- White textured insulation on underside of laboratory sink was observed in RM1. The sink and the textured insulation were observed to be intact. – Approximately 2 SF.
- Black laboratory countertop was observed in RM1. The associated mastic is also suspected ACBM. The countertop was observed to be intact, and no visible mastic was noted. – Approximately 10 SF.
- Tan Flooring (linoleum) was observed in RM1 and RM2. The associated mastic is also suspected ACBM. The flooring was observed to be intact, and no visible mastic was noted. – Approximately 210 SF.
- Red carpeting was observed in the Hall. The associated mastic is also suspected ACBM. Carpet was observed to be intact, and no visible mastic was noted. – Approximately 80 SF.

The aforementioned Suspect ACMs were observed to be in good condition (intact), except where noted above. The Suspect ACMs will need to be removed as part of future asbestos abatement activities prior to any renovation or demolition projects affecting said materials; unless bulk samples are collected and analyzed, and based on the analysis, the materials are determined to not contain asbestos.

*Soule Gymnasium*

Building materials that are considered to be suspect ACBM are identified below:

Exterior:

- Roofing materials on building (asphalt shingles, tar, sublayers, etc.). – Approximately 4,600 SF.
- Roofing materials on detached sheds (asphalt shingles, tar, sublayers, etc.). – Approximately 75 SF.

Interior:

- Loose acoustical ceiling panels (2 boxes of 10 panels each) were observed to be stored in RM1. Packages of ceiling tiles were observed to be intact. – Approximately 160 SF.
- Blue wall tile was observed in RM2. The associated grout and mastic are also suspected ACBM. Wall tiles were observed to be intact, and no visible mastic was noted. – Approximately 210 SF.
- Black floor tile was observed in RM2. The associated grout and mastic are also suspected ACBM. Floor tiles were observed to be intact, and no visible mastic was noted. – Approximately 80 SF.
- Black slip-resistant flooring was observed in RM4 and RM6. The associated mastic is also suspected ACBM. The flooring was observed to be intact, and no visible mastic was noted. – Approximately 200 SF.
- White ceiling board was observed at the basement exits, RM 4 and RM6. The ceiling board was observed to be intact. – Approximately 210 SF.
- Black cove base was observed in RM5. The associated mastic is also suspected ACBM. Cove base was observed to be intact, and no visible mastic was noted. – Approximately 75 SF.
- White 2'x4' acoustical ceiling panels were observed in RM5. The ceiling panels were observed to be intact. – Approximately 3,300 SF.
- Pipe Fitting Insulation (joints and elbows) on fiberglass-insulated pipes was observed in the attic and basement. This material is also assumed to be located behind walls and above ceilings. The fittings that were able to be observed were noted to be intact. – Approximately 175 LF.

The aforementioned Suspect ACMs were observed to be in good condition (intact), except where noted above. The Suspect ACMs will need to be removed as part of future asbestos abatement activities prior to any renovation or demolition projects affecting said materials; unless bulk samples are collected and analyzed, and based on the analysis, the materials are determined to not contain asbestos.

ENGINEERS & ENVIRONMENTAL PROFESSIONALS

POLYCHLORINATED BIPHENYLS

On December 27, 2016 Ms. Snyder and Ms. Knowles also visually inspected the Subject Property for building materials that could contain polychlorinated biphenyls (PCBs). As was the case with suspect ACM, samples of the suspected PCB-containing materials were also not collected in order to maintain the integrity and aesthetic appeal of the buildings.

Building materials that are suspected of being PCB-containing are as follows:

Baldwin School

- Window/Door caulking and glazing – Approximately 80 windows (and door windows) of various shapes and sizes.

Soule Environmental Science Center

- Window/Door caulking and glazing – Approximately 15 windows (and door windows) of various shapes and sizes.

Soule Gymnasium

- Window/Door caulking and glazing – Approximately 28 windows (and door windows) of various shapes and sizes.

- Grout compound at wall intersections (observed in basement stairwell) – Approximately 10 LF.

CONCLUSIONS AND RECOMMENDATIONS

The aforementioned Suspect ACMs were observed to be in good condition (intact). The Suspect ACMs will need to be removed as part of future asbestos abatement activities prior to any renovation or demolition projects that would disturb those materials; unless bulk samples are collected and analyzed, and based on the analyses the materials are determined to not contain asbestos. EndPoint conducted this asbestos survey using visual observations only; therefore, this asbestos survey does not meet the NESHAPs Regulation for obtaining a building permit to renovate or demolish the portions of the building described within this report. As previously mentioned, should renovations or demolition be required in any of the aforementioned areas, a thorough asbestos survey including bulk sample collection and analysis would be required to determine if the suspect ACBMs do not contain asbestos. Note that there is a 10-day permit process to obtain an asbestos abatement permit.

The suspected PCB-containing materials, including the window/door glazing and caulking, and any brick or cement joint caulking/grout would need to be sampled and analyzed in order to determine if the materials do not contain PCBs, prior to any renovation or demolition.

We appreciate the opportunity to assist you in this matter. Please call us if you have any questions regarding this report or any other matter at (603) 965-3810.

Sincerely,
**EndPoint, LLC**

Katie Snyder
Asbestos Inspector (AI900553)

Richard J. Wozmak, P.E., P.H., LSP, LEP
Principal

Attachments: Floor Plan Figures
Photographic Log

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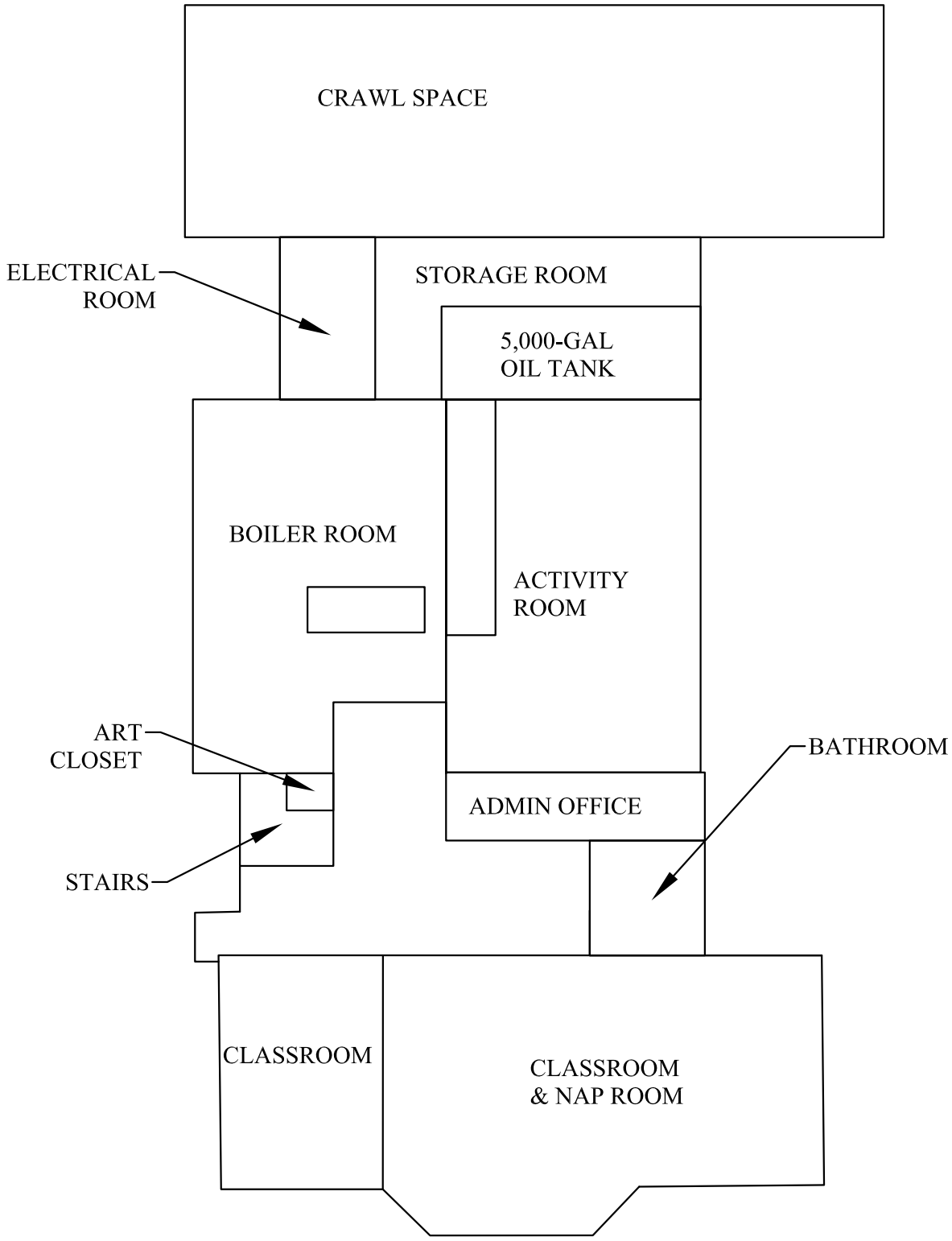


## Legend

Note: Site features are approximate and for illustrative purposes only.

EndPoint LLC
ENGINEERS & ENVIRONMENTAL PROFESSIONALS
25 Buttrick Road, Unit D2
Londonderry, NH 03053

| | |
|---|---|
| CLIENT: | Jonathan Levi Architects |
| PROJECT: | Baldwin School & Soule Recreation Center |
| TITLE: | Baldwin School Floor Plan - Basement |

| DESIGNED: | DRAWN: | CHECKED: | APPROVED: | FIGURE NO.: |
|---|---|---|---|---|
| KLS | KLS | KLS | RJW | 1 |
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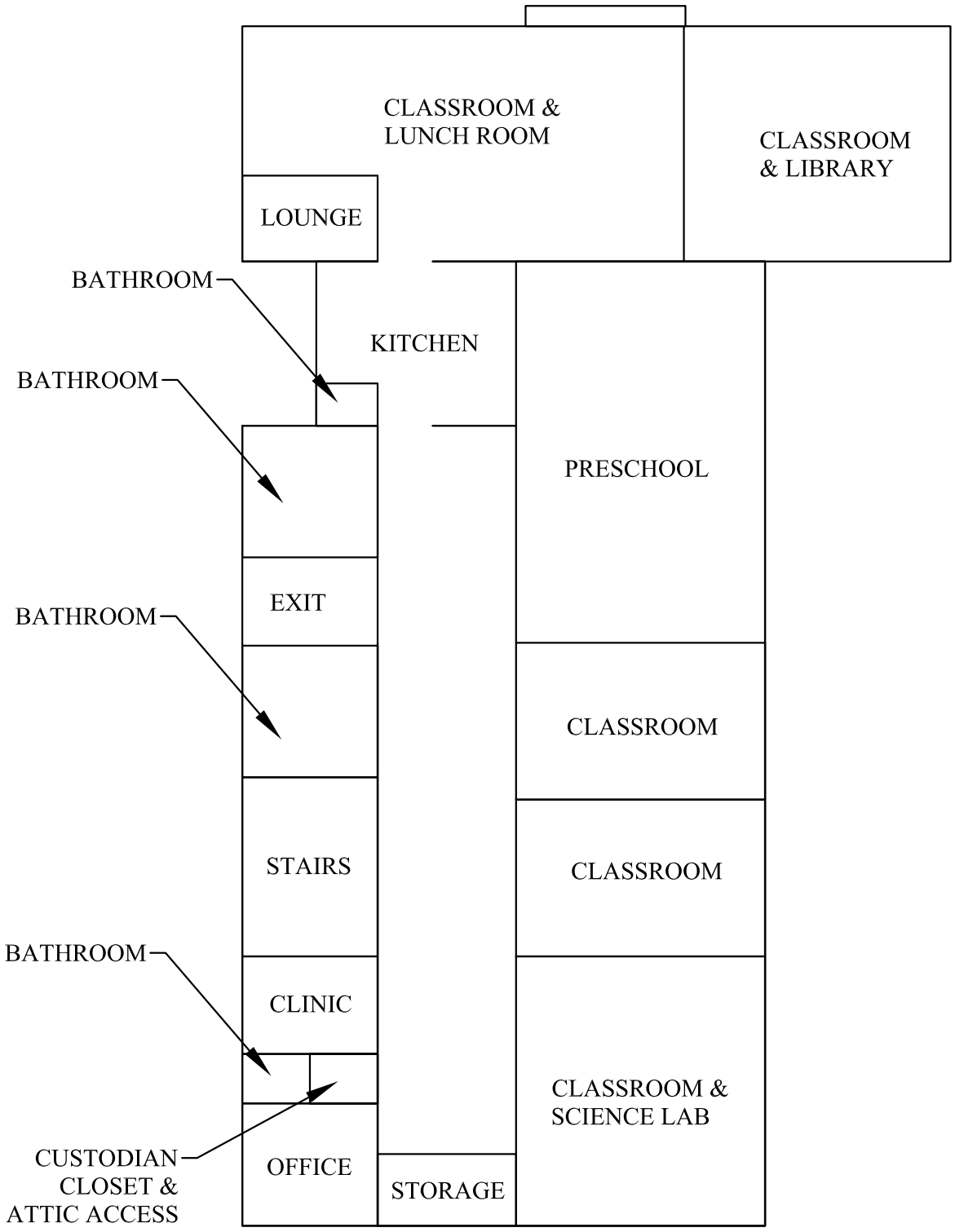


## Legend

Note: Site features are approximate and for illustrative purposes only.

EndPoint LLC
ENGINEERS & ENVIRONMENTAL PROFESSIONALS
25 Buttrick Road, Unit D2
Londonderry, NH 03053

CLIENT: Jonathan Levi Architects

PROJECT: Baldwin School & Soule Recreation Center

TITLE: Baldwin School Floor Plan - First Floor

| DESIGNED: | DRAWN: | CHECKED: | APPROVED: | FIGURE NO.: |
|---|---|---|---|---|
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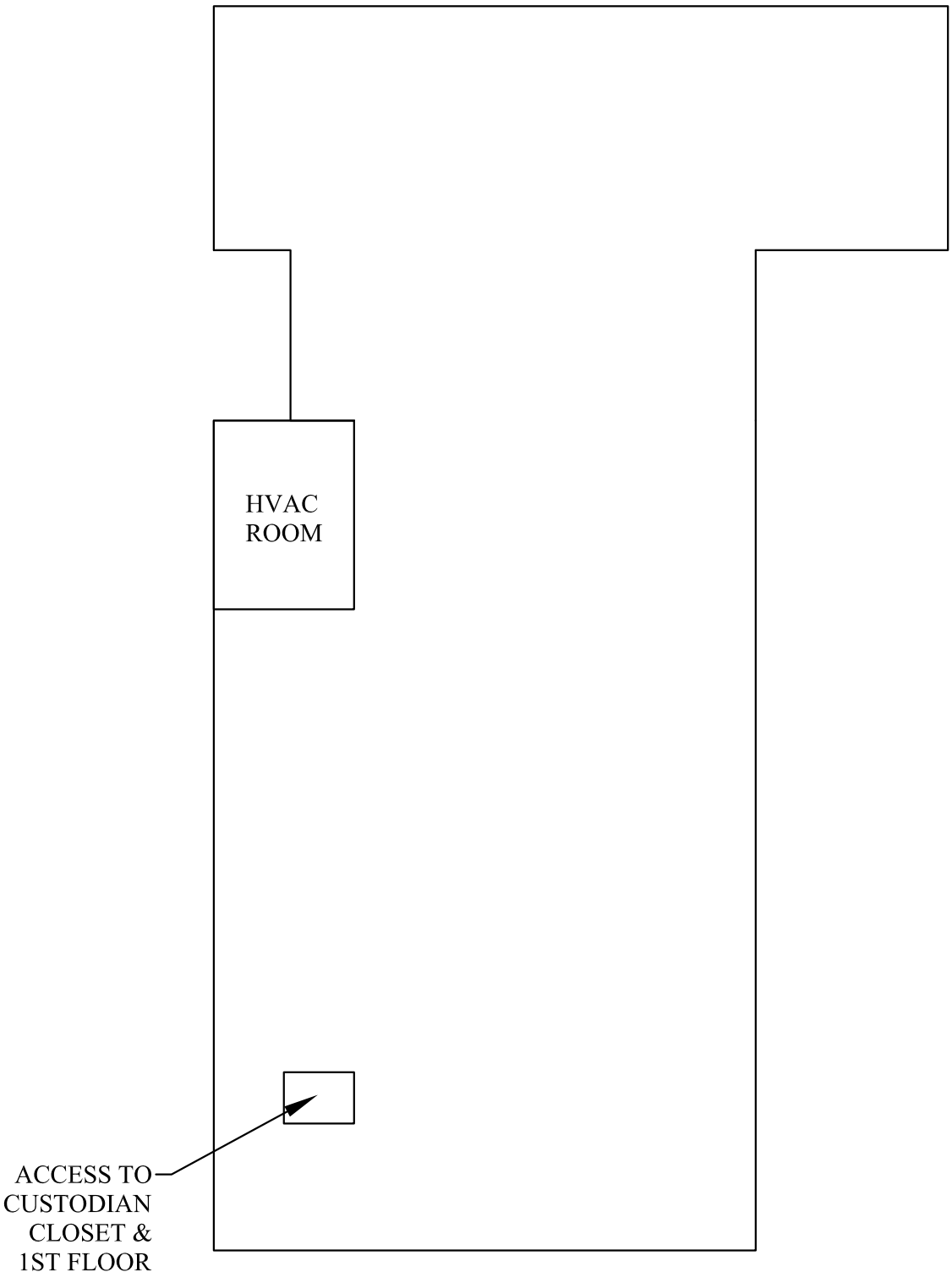


## Legend

Note: Site features are approximate and for illustrative purposes only.

EndPoint LLC
ENGINEERS & ENVIRONMENTAL PROFESSIONALS
25 Buttrick Road, Unit D2
Londonderry, NH 03053

| | |
|---|---|
| CLIENT: | Jonathan Levi Architects |
| PROJECT: | Baldwin School & Soule Recreation Center |
| TITLE: | Baldwin School Floor Plan - Attic |

| DESIGNED: | DRAWN: | CHECKED: | APPROVED: | FIGURE NO.: |
|---|---|---|---|---|
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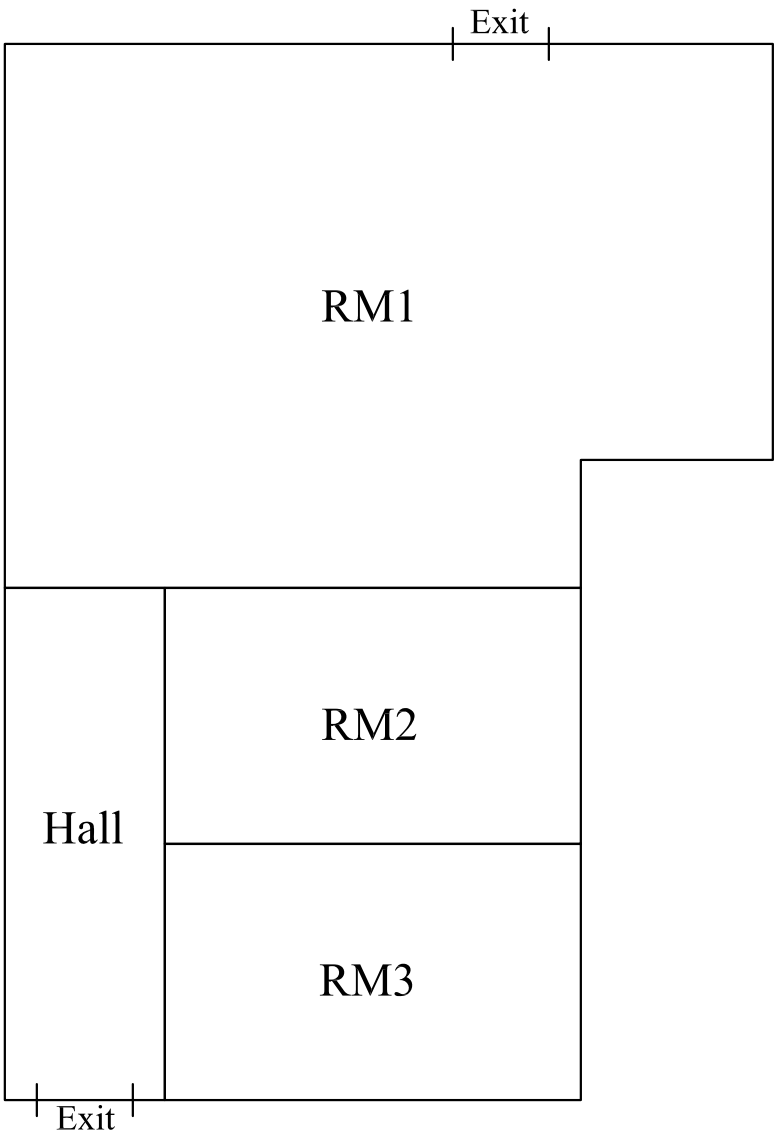


## Legend

Note: Site features are approximate and for illustrative purposes only.

EndPoint LLC
ENGINEERS & ENVIRONMENTAL PROFESSIONALS
25 Buttrick Road, Unit D2
Londonderry, NH 03053

CLIENT: Jonathan Levi Architects

PROJECT: Baldwin School & Soule Recreation Center

TITLE: Soule Environmental Education Center Floor Plan

| DESIGNED: | DRAWN: | CHECKED: | APPROVED: | FIGURE NO.: |
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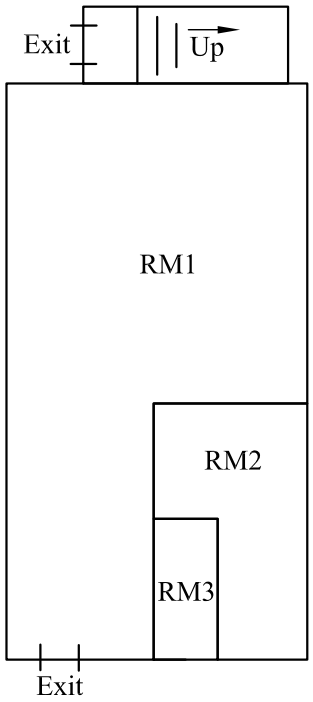
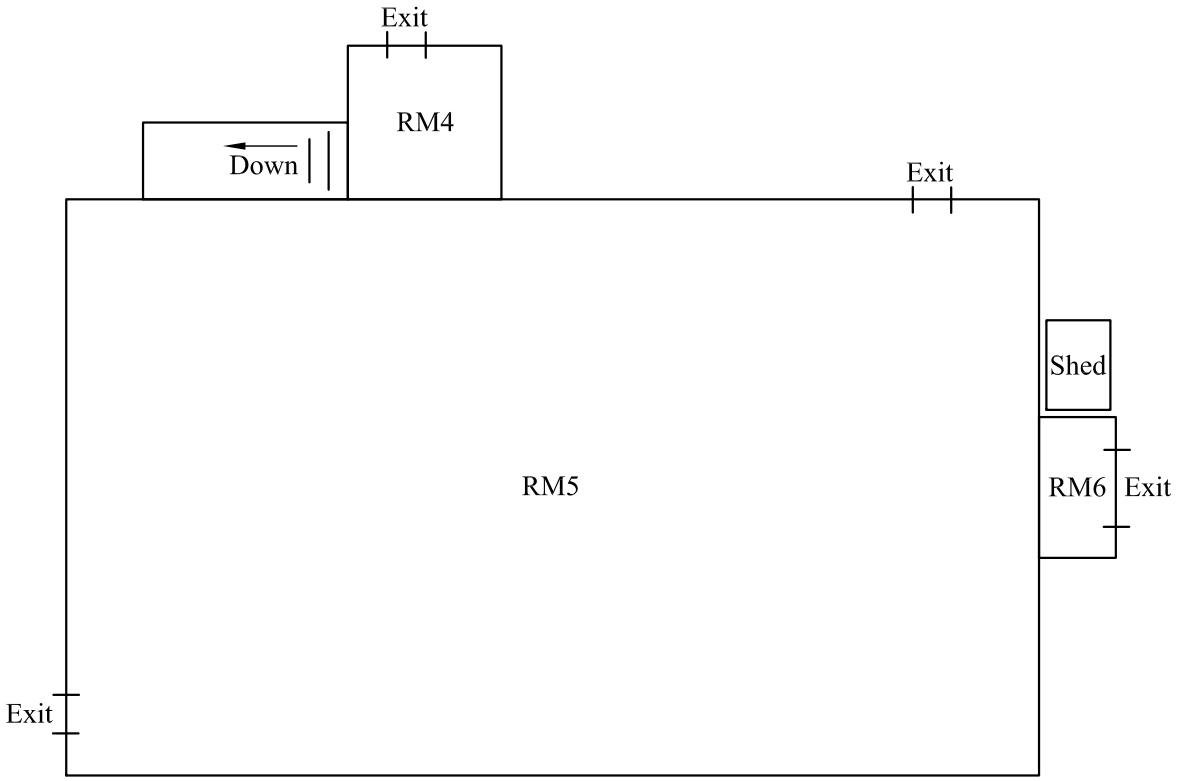



Basement




First Floor

Legend

Note: Site features are approximate and for illustrative purposes only.

EndPoint LLC
ENGINEERS & ENVIRONMENTAL PROFESSIONALS
25 Buttrick Road, Unit D2
Londonderry, NH 03053

CLIENT: Jonathan Levi Architects

PROJECT: Baldwin School & Soule Recreation Center

TITLE: Soule Gymnasium Floor Plan

| DESIGNED: | DRAWN: | CHECKED: | APPROVED: | FIGURE NO.: |
|---|---|---|---|---|
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Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – 484/490 Heath Street


Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Throughout (classrooms, bathrooms, office/storage, and hallways)
Smooth Plaster on Ceilings and Walls

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Bathrooms on 1st Floor
½" White Floor Tile w/ Grout & Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Bathrooms and Water Fountain Areas on 1st Floor
Wall Tile w/ Grout & Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Kitchen, and under carpet in Classroom/Lunchroom, and Lounge
Tan 9”x9” Floor Tiles w/ Mastic

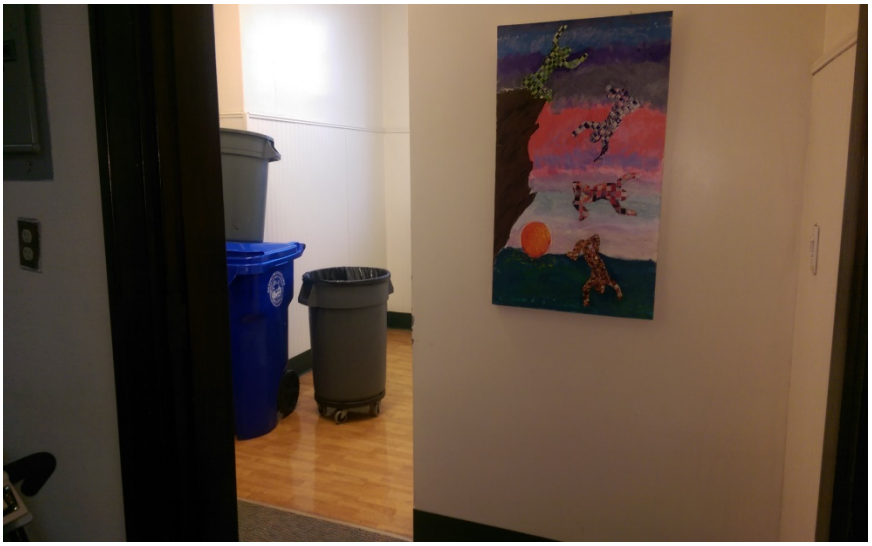
Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Kitchen
Green 9”x9” Floor Tiles w/ Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Classroom/Lunchroom and Classroom/Library
Beige 12”x12” Floor Tiles w/ Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Front and Side Entrances
Red/Brown 4”x4” Floor Tiles w/ Grout & Mastic


Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – 1st Floor Hallway
Blue Carpet w/ Mastic


Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – 1st Floor Classrooms and Offices
Green Carpet w/ Mastic

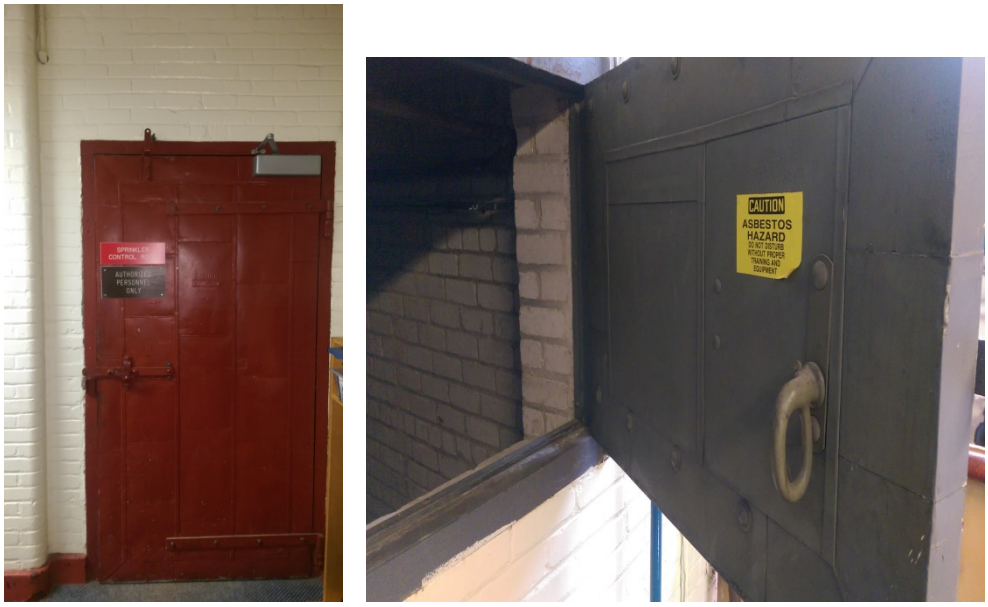


Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – 1st Floor Bathroom
Wainscoting w/ Mastic on Plaster Walls

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Basement Classrooms, Nap Room, Bathroom, and Hallway
Tan Flooring w/ Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Basement Activity Room, Office, Classrooms, and Hallway
Blue Carpet w/ Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Basement Activity Room
Textured/Cementitious 12”x12” Ceiling Tiles




Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Boiler Room
Fire Safe Doors

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Attic, Boiler Room, and behind Walls/Ceilings
Pipe Fitting Insulation on Fiberglass-insulated Pipes (joints and elbows)

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Exterior
Window Glazing and Caulking (may also contain PCBs)

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Exterior
Roofing Material (Adhesive on Clay/Slate Shingles, Tar, Sublayers, etc.)

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Exterior
Roofing Materials (Shingles, Tar, Sublayers, etc.)

Baldwin School and Soule Recreation Center, Brookline, MA
Baldwin School – Exterior Storage Sheds
Roofing Material (Shingles, Tar, Sublayers, etc.)


Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – 654 Hammond Street


Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – RM1
Tan Flooring and Wallboard & Joint Compound (on ceilings and walls)

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – RM1
Tan Cove Base w/ Mastic, and Black Laboratory Counter Top

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – RM1
White Textured Insulation on Underside of Sink.

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – RM2 (left) and RM3 (right)
Tan Flooring w/ Mastic, Tan Cove Base w/ Mastic, and Light-green Wallboard and Joint Compound.

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – Storage Shed
Roofing Materials (Rolled Roofing, Tar, Sublayers, etc.)

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – Exterior
Roofing Material (Shingles, Tar, Sublayers, etc.)

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Environmental Education Center – Exterior
Stucco/Cementitious Siding Material


Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – 650 Hammond Street

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – Basement Stairwell
Grout Compound at Wall Intersections (may also contain PCBs)

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – RM1 (Basement)
Replacement Acoustical Ceiling Panels.

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – RM2 (Basement)
Blue Wall Tile w/ Grout & Mastic and Black Floor Tile w/ Grout & Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – RM4
Black Non-slip Flooring w/ Mastic

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – RM5
Black Cove Base w/ Mastic and White 2'x4' Acoustical Ceiling Panels

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – Attic, behind Walls/Ceilings
Pipe Fitting Insulation on Fiberglass-insulated Pipes (joints and elbows)

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – Exterior Storage Shed
Roofing Materials

Baldwin School and Soule Recreation Center, Brookline, MA
Soule Gymnasium – Exterior
Roofing Materials (Shingles, Tar, Sublayers, etc.)

## SECTION 024119 - BUILDING DEMOLITION

1. Work Included: Demolish and remove existing buildings, materials, systems, equipment, and structures indicated on the Drawings.

2. Occupancy: Buildings to be demolished will be unoccupied prior to commencement of demolition.

3. Temporary Protections: Provide temporary barricades and other forms of protection as required to for protection of personnel from injury due to demolition operations.

   a. Provide shoring and bracing as required to prevent collapse of existing systems and adjacent facilities or work to remain.
   b. Remove temporary protections at completion of the work.

4. Coordination with Owner: Coordinate schedule of building demolition operations with Owner in order to allow Owner plenty of time to install temporary heating systems to the adjacent Walsh building.

5. Locate, identify, stub-off, and disconnect utility services that are indicated not to remain. Provide by-pass services as necessary to maintain continuity of service to occupied areas.

6. Where items are indicated to be salvaged, carefully remove indicated items, clean items, and deliver to storage area designated by Owner.

7. Material resulting from demolition and not identified for salvaging shall become the property of the Contractor and shall be legally transported and disposed of off-site. Disposal shall be performed as promptly as possible and not left until the final clean up.

-END OF SECTION-

SECTION 035413

GYPSUM CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.2 SUMMARY

A. Section includes self-leveling, gypsum cement underlayment and acoustical mat for application below interior VCT floor coverings on the second and third floor.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

1. STC Rating of assembly shall be STC-57.

2.2 GYPSUM CEMENT UNDERLAYMENTS

A. Gypsum Cement Underlayment: Self-leveling, gypsum cement product that can be applied in uniform thickness.

1. Basis-Of-Design Product: Provide Gyp-Crete 2000/3.2K Floor Underlayment as manufactured by Maxxon Corpration, or equal products by one of the following, or equal:

a. ARDEX Americas.
b. Euclid Chemical Company (The); an RPM company.
c. Hacker Industries, Inc.
d. MAPEI Corporation.
e. Maxxon Corporation.
f. United States Gypsum Company.

2. Cement Binder: Gypsum or blended gypsum cement as defined by ASTM C 219.
3. Compressive Strength: Not less than 3,000 psi at 28 days when tested according to ASTM C 109/C 109M.
4. Density: Not less than 115 pounds per cubic foot.

2.3 ACCESSORIES

A. Sound Mat:

1. Basis-Of-Design: Provide the Acousti-Mat II HP Sound Mat, or equal by one of the

following, or equal:

a. Allied Custom Gypsum Plasterworks, LLC.
b. Dura Undercushions Ltd.
c. Hacker Industries, Inc.
d. Keene Building Products.
e. Maxxon Corporation.
f. United States Gypsum Company.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

B. Sound Control Mat: Install sound control materials according to manufacturer's written instructions.

1. Do not install mechanical fasteners that penetrate through the sound control materials.

3.2 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

B. Apply surface sealer at rate recommended by manufacturer.

C. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.3 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION

SECTION 042000

UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide unit masonry work, as indicated on Drawings and as specified herein.
1. Brick masonry veneer.
2. Masonry reinforcing, anchors, and ties.
2. Cavity wall insulation.

B. Products installed, but not furnished, under this Section include the following:

1. Steel lintels and shelf angles for unit masonry, furnished under Section 055000, METAL FABRICATIONS.

PART 2 PRODUCTS

2.01 BRICK VENEER

A. Provide face brick conforming to ASTM C 216, Grade SW, Type FBS. Provide building brick conforming to ASTM C 62. Use building brick only where concealed from view. Provide brick masonry as follows:

1. Size: 8 in. x 8 in.
2. Shapes: Provide special shapes where indicated. Never expose cores, frogs, or unfinished surfaces. Provide solidly-grouted bricks at tops of walls and under wall openings.
3. Color/Finish/Texture:

a. Brick Type 1: Color shall be equal to Endicott's Medium Iron Spot #46; as manufactured by Endicott Clay Products; or approved equal by Belden Brick or Morin Brick. Finish of Brick shall be smooth.

1) Brick shall have factory cut false 3/8 in. joints; 4 different patterns (1 without joint).

2.02 MORTAR MATERIALS

A. Portland cement: ASTM C 150, Type I, free from water soluble salts and alkalies. Provide cement which exhibits no efflorescence when tested in conformance with these specifications.

B. Lime: ASTM C 207, hydrated, Type S.

C. Grout Aggregate: Complying with ASTM C 404.

D. Mortar Aggregate: Complying with ASTM C 144, well graded.

E. Mortar Pigment: Natural and synthetic oxides of iron and chrome, compounded for use in mortar. Use only pigments with proven record of performance. Provide products equal to Davis Colors or Solomon Grind-Chem.

F. Water: Clean, potable.

2.03 REINFORCING TIES AND ANCHORS

A. Masonry Tie to Steel Z-Furring: Masonry Ties for anchoring of masonry veneer facing wythes to galvanized steel z-channels shall be “HB-345-BT”, as manufactured by Hohmann & Barnard, Inc; or approved equal.

B. Miscellaneous Ties: Provide stainless steel straps, bars, rods, and similar items which are fabricated from minimum 16 gage stainless steel sheet or 3/16 in. diameter stainless steel wire.

2.04 MISCELLANEOUS MATERIALS

A. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches.

B. Cavity Drainage Material: thickness as required to fit firmly between back of masonry veneer and face of cavity wall insulation, free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings. Subject to compliance with requirements, provide one of the following:

1. Mortar Break; Advanced Building Products, Inc.
2. CavClear Masonry Mat; CavClear.
3. Mortar Net; Mortar Net USA, Ltd.
4. Mortar Stop; Polytite Manufacturing Corp.

2.05 MORTAR AND GROUT MIXES

A. Mortar: Provide mortar complying with ASTM C 270. Mix using known volume measures. Do not batch by shovel.

1. Provide Type N mortar for masonry above grade exterior work, except as indicated otherwise.

B. Do not use admixtures or anti-freeze agents. Do not use masonry cement. Do not use calcium chloride or any compounds or mortar ingredients containing chlorides.

1. To prevent color variations, do not retemper mortar which contains color pigments.

B. Mortar Color: Provide mortar with color as determined by Architect. Do not exceed pigment to mortar ratio by 1:10.

END OF SECTION

## I. Structural Systems Overview

The proposed new building will consist of three and four stories with a lower level below grade primarily for parking. The proposed building structure will be a structural steel frame with concrete floor slabs on composite steel deck. The roof will be steel roof deck except at areas where concrete is required for sound attenuation below rooftop mechanical equipment or for fire ratings. Lateral loads will be resisted by structural steel braced frames. Foundations will be cast-in-place reinforced concrete walls, slabs-on-grade, and spread footings.

## II. Foundations

Based on information provided by McPhail Associates in the 15 February 2017 document titled "Geotechnical Engineering Data Report", foundations for the project will be as follows:

### A. Walls

Typical foundation walls will be 16-inch thick reinforced concrete with 8-inch wide shelves as required to support façade elements. Exterior foundation walls will extend down to a minimum of 4'-0" below finished exterior grade. A drainage system will be installed around the perimeter of the foundation to divert ground water away from the building. All foundation walls enclosing below-grade space shall be waterproofed on the exterior surface.

### B. Slab-on-Grade

The lower level and first floor slab-on-grade will be a 5-inch thick slab-on-grade. A 15-mil vapor barrier and a 12-inch layer of crushed stone will be placed beneath the slab to provide an adequate substrate and to allow for an under-slab drainage system. An allowance shall be provided for depressions, and trenches, and other potential equipment requirements.

### C. Footings

The foundations will be reinforced concrete spread footings and continuous wall footings bearing on compacted structural fill or undisturbed soil. The allowable bearing pressure will be per the recommendations of the geotechnical report which states a maximum uniform design force of 4 tons per square foot.

### D. Pits

Elevator and other pits that may be required pits will consist of an 18-inch thick reinforced concrete base slab and 12-inch thick reinforced concrete pit walls. All pits shall receive waterproofing.

E. Foundation Requirements

Based on the geotechnical report the site is underline with shallow bedrock. Depending on the final location of the building it is possible that bedrock excavation will be required to construct the building foundation and underground utilities.

## III. Gravity Load System

A. Ground Floor

Slab-on-grade as described above.

B. Typical Floor Construction

Floor construction will be 3¼-inch lightweight concrete on 3-inch deep, 18-gage galvanized, composite steel deck for a total slab thickness of 6¼-inches. The floor slab will be reinforced with WWF 6x6-W4.0xW4.0 throughout. Beams and girders will be structural steel rolled shapes (typically W14, W16, & W18) made composite with the floor slabs via ¾-inch diameter, 5½-inch long welded steel shear studs. Columns will be structural steel rolled shapes (typically W12).

C. Typical Roof Construction

The roof will be 3-inch deep, 18 gage, galvanized steel roof deck. Roof beams and girders will be structural steel rolled shapes. Where it is preferred or necessary to place concrete on the roof, the construction will be similar to the typical floor construction described above. Hot-dipped galvanized steel dunnage will be provided on top of the roof if necessary to support mechanical equipment and for mechanical equipment screening.

D. Typical Façade Support

Continuous support of the building façade is expected to occur from each framed level above grade. This may likely consist of hung steel angle frames with all material outside the air and vapor barrier system to be hot-dipped galvanized.

E. Atrium Glass Wall with Treehouses

The central corridor atrium glass wall and balconies with treehouse projections will be framed with structural steel. The random pattern of atrium wall glass will lend itself to a roof-supported steel frame consisting of a plate girder spanning the length of the atrium glass wall with plate hangers dropping down the inside of the glass to support intermediate mullion girts that span horizontally across the length of the windows. Hangers will drop below the upper girt to the lower girt to match the pattern of the glass mullions. The steel balconies will cantilever from the building columns with no hangers. Support of the tree house will be achieved by extending steel framing from the balcony across the horizontal atrium glass wall girts and cantilevering outside the building plane to support the treehouse floor. Steel tube framing shall extend from the floor of the

treehouse to support the treehouse roof. All steel supporting the atrium glass wall and treehouse roof structures shall be architecturally exposed structural steel.

**IV. Lateral Load System**

The lateral force resisting system will consist of concentrically braced steel frames in both primary structural directions. Structural steel tubes will be oriented diagonally in vertical planes between columns to provide resistance to wind and seismic forces. Final locations of the frames will be coordinated with the architectural layout as design progresses.

**V. Structural Quantities for Estimating**

A. Steel wide flange framing, tube columns and tube bracing for the floor and roof construction shall be estimated at 12 pounds per square foot of framed area.

B. Headed shear studs shall be used at all new slabs that bear on steel framing and shall consist of studs that are ¾" diameter and 4 inches high and shall be estimated at 200 per every 1,000 square feet of deck slab area.

C. The mechanical duct path will require that reinforced steel web openings be placed in some steel beams which should be all shop installed with a quantity estimated at 20 reinforced penetrations per floor.

D. Façade support framing for masonry relief shall consist of hung angles and angle bracing in addition to slab-support relief with all framing outside the air and vapor barrier to be hot dipped galvanized and shall be estimated at 0.5 pounds per square foot of framed area.

E. Bay window framing shall consist of HSS sections fabricated into the bay configurations with welded joints and shall be estimated at 0.5 pounds per square foot of framed area.

F. Floor and roof slab construction shall consist of 3" high, 18 gage galvanized composite steel deck with 3½" of normal weight concrete topping for a total slab thickness of 6½" and shall be reinforced with WWF – W3.0xW3.0.

G. Atrium glass wall framing shall be added to the steel tonnage listed above and shall consist of a single plate girder at the roof over each of the two atrium glass walls with an estimated weight 8 tons each plus a total of 30 plate hangers measuring ¾" x 3" at 15 feet long which shall support 6 curved HSS horizontal girts weighting 2 tons each and the four end columns that support the two atrium walls shall be estimated at 3 tons each and all steel hangers and girts shall be architecturally exposed structural steel.

H. Atrium treehouse framing shall be added to the steel tonnage listed above and shall consist of HSS framing the floor and roof totaling 4 tons for each of the four treehouses at the central atrium space and all steel shall be architecturally exposed structural steel.

I. Steel framing for roof screening and equipment dunnage shall be hot-dipped galvanized HSS sections with bolted connections totaling 30 tons which shall be added to the steel tonnage listed above.

J. Column spread footings shall be estimated at 8 feet x 8 feet x 2 feet deep with 60 pounds of reinforcement per cubic yard of concrete and shall be counted as one footing per 700 square feet of building footprint area.

K. Perimeter wall footings shall be estimated at 4 feet by 18 inches deep with 100 pounds of reinforcement per cubic yard of concrete.

L. Foundation walls shall be estimated at 16 inches thick with 6.5 pounds of reinforcement per square foot area of wall.

M. Concrete slab on grade shall be 6 inches thick and shall be reinforced with WWF – W3.0xW3.0.

N. Pits for elevators and mechanical and plumbing systems shall have 18-inch-thick base slabs and 12-inch-thick walls and shall be reinforced at 150 pounds per cubic foot of concrete.

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SECTION 054000

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Furnish and install cold formed steel framing, as indicated on the Drawings and as specified herein. Cold formed steel framing includes but is not necessarily limited to:

1. Cold formed steel stud exterior vertical and horizontal framing, including cross-bridging, bracing, and anchoring to the building structure, complete in all respects.
2. Z-furring at exterior walls.
3. Interior soffit framing.
4. Interior partition supports, including box beams and hangers at classroom corridor walls.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:

1. AllSteel Products, Inc.
2. Clark Steel Framing.
3. Craco Metals Manufacturing, LLC.
4. Dale/Incor.
5. Dietrich Metal Framing; a Worthington Industries Company.
6. MarinoWare; a division of Ware Industries.
7. Steel Construction Systems.
8. United Metal Products, Inc.

2.02 FRAMING COMPONENTS

A. Studs shall be 16 gauge or heavier except where noted on the Drawings. Studs shall be manufactured from steel sheet meeting the requirements of ASTM A 1003, Structural Grade, Type H with a minimum yield strength of 50,000 psi. Studs shall have pre-punched holes. Studs shall be hot dip galvanized in accordance with the following:

1. Grade: ST50H (ST340H).
2. Coating: G90 (Z275).

C. Z-Furring: Provide ZF_Series Z-furring as manufactured by Dietrich Metal Framing, or approved equal. Z-furring shall be minimum 20 gage galvanized steel, sizes as required.

D. Tracks shall be 18 gauge or heavier unpunched tracks manufactured of commercial quality steel sheet meeting the requirements of ASTM A 1003 with a minimum yield strength of 50,000 psi. Provide special shaped tracks with one 4 in. high leg where required. Tracks shall be hot dip galvanized in accordance with the following:

1. Grade: ST50H (ST340H).
2. Coating: G90 (Z275).

E. Bridging shall be manufacturer's recommended type to meet the design criteria set forth in Paragraph 1.08 of this Section.

F. Attachment angles, closure angles, and other miscellaneous components shall be manufactured of commercial quality steel sheet meeting the requirements of ASTM A 446 with a minimum yield strength of 50,000 psi and shall be formed to profiles. All components shall be hot dip galvanized in accordance with ASTM A 525, G 60 Coating Designation.

G. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with un-stiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads, and as follows:.

1. Minimum Uncoated-Steel Thickness: 0.0538 inch (1.37 mm).
2. Flange Width: A minimum of 2 inches (50 mm), unless otherwise noted.

H. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with un-stiffened flanges.

1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads, and as follows:

a. Minimum Uncoated-Steel Thickness: 0.0538 inch (1.37 mm).
b. Flange Width: A minimum of 3 inches (75 mm), unless otherwise noted.

2. Inner Track: Of web depth indicated, and as follows:

a. Minimum Uncoated-Steel Thickness: 0.0538 inch (1.37 mm).
b. Flange Width: Minimum flange width of 4 inches (100 mm).

I. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure.

2.03 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 55] threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.04 PAINT

A. Zinc Rich Paint: Zinc rich paint for touch up repair of galvanized coatings damaged during handling and erection and field welding shall conform to ASTM A 780 for zinc-rich primer. Paint shall be equal to one of the following:

| Product | Manufacturer |
|---|---|
| ZRC Cold Galvanize Compound | ZRC |
| ZIRP | Duncan Industries |

B. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.

END OF SECTION

## SECTION 055000 - METAL FABRICATION

1. Description of Work: The scope of work includes:

   a. Steel handrails, guardrails and railings.
   b. Steel pipe bollards.
   c. Miscellaneous framing and supports for the following:

      1) Framing, platforms, and supports for equipment.
      2) Counters, benches, and vanities.

   d. Shop priming and finish painting of hot-dip galvanized work.

2. Materials, General: Provide products and materials of new stock, free from defects, and of best commercial quality for each intended purpose.

   a. Steel Plates, Shapes, and Bars: ASTM A 36.

   b. Steel Tubing: ASTM A 500 or A 501, hot or cold rolled, as required for design loading.

   c. Steel Pipe: ASTM A 53, schedule 40, Type S (seamless), black except where galvanized is indicated, Grade A for cold-bending.

   d. Steel Sheet: ASTM A 366, A 570, or A 611, grade required for design loading.

   e. Bolts and fasteners: ASTM A 307 and A 325.

   f. Concrete: Concrete fill for steel bollards is specified in Section 033000, CAST-IN-PLACE CONCRETE.

   g. Inserts: Threaded or wedge type, galvanized ferrous castings; either ASTM A 47 malleable iron, or ASTM A 27 cast steel. Provide threaded inserts and wedge inserts.

   h. Provide exposed fastenings of same material and finish as metal to which applied, unless otherwise noted.

   i. Welding rods: Conform to AWS Standards and recommendations of welding rod manufacturer.

   j. Grout for Interior Applications: Pre-mixed, non-staining, non-corrosive, non-shrink, non-metallic complying with CE CRD-C-621, Type D.

   k. Grout for Exterior Applications: Provide Factory-packaged, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water at project site. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating.

3. Fabrication - General: Fabricate work of this Section to be straight, plumb, level and square, and to sizes, shapes and profiles indicated on approved shop drawings. Ease exposed edges. Cut, reinforce, drill and tap metal work as required for proper assembly.

   a. Fabricate miscellaneous supports, brackets, braces and the like required to fully complete the work.
   b. Obtain loading requirements from suppliers of work to be supported. Design and support systems with a safety factor of at least 6 unless otherwise indicated.
   c. Allow for thermal movement resulting from 100°F change in ambient temperature.
   d. Shear and punch metals accurately. Remove burrs.
   e. Ease exposed edges to a radius of approximately 1/32 in., unless indicated otherwise. Form bent corners to smallest radius possible without causing grain separation or impairing work.
   f. Remove sharp or rough areas on exposed traffic surfaces.
   g. Weld seams continuously. Spot welding is permitted for temporary welding only.

4. Work Exposed to View: For work exposed to view, select materials with special care. Provide materials which are smooth and free of blemishes such as pits, roller marks, trade names, scale and roughness. Fabricate work with uniform hairline joints. Form welded joints and seams continuously. Grind welds flush to be smooth after painting. For exposed fasteners, use hex head bolts or Phillips head machine screws.

5. Radius/Curved Work: Form radius/curved work to true radius without segmentation, buckling, warping, or otherwise altering member dimensions or appearance. Where member cannot be formed to required dimensions, provide equal shape and size member fabricated from equivalent plate stock, fabricated, welded and ground to provide required appearance and performance.

6. Galvanizing: Hot-dip galvanize exterior metal fabrications, items located at exterior locations, and other items indicated to be galvanized, in compliance with ASTM A 123, ASTM A 153, or ASTM A 386. Provide minimum 1.5 oz./ft.$^2$ zinc coating. Galvanize after fabrication.

7. Steel Handrails and Guardrails: Conform to ASTM E 985 for design and engineering for 9 performance based on testing performed in accordance with ASTM E 894 and ASTM E 935, using load and deflection values specified below. Design and fabricate handrails and guardrails to support 50 lb. per linear foot uniform load and 200 lb. concentrated load, located at any point to cause greatest stress horizontally or vertically.. Load conditions do not act concurrently. Design maximum deflection of any member under load conditions shall not exceed L/360.

8. Concrete Filled Pipe Bollard Fabrication: Provide minimum 8 in. diameter Schedule 80 steel pipe of length to extend from at least 64 in. below grade to at least 48 in. above grade, unless otherwise indicated.

9. Miscellaneous Framing and Supports: Fabricate miscellaneous framing and supports to adequately support live and dead loads with a safety factor of 6. Provide necessary anchors, inserts, and fasteners. Fabricate support system to carry entire load of work being supported to structure above. Do not transfer any loads to ceiling systems.

10. Counter and Bench Supports: Fabricate counter and bench support brackets to support weight of counter, bench or table, plus an additional 500 lbs. concentrated load located to

create greatest stress. Fabricate brackets to be inconspicuous from normal viewing angles, unless otherwise indicated on Drawings. Drill brackets for anchor bolts and fasteners.

-END OF SECTION-

## SECTION 061000 - ROUGH CARPENTRY

1. Description of Work: Provide all rough carpentry work, as indicated on the Drawings and as specified herein. Rough carpentry shall include but not be limited to:

   a. Rough hardware, inserts, and related metal components.
   b. Rough carpentry sleepers, blockings, curbs, cants, edgings, grounds, nailers, and furring.
   c. Wood preservative treatments and applications.
   d. Fire-retardant treatments and applications.
   e. Construction panels, including plywood backing panels for electrical and telephone equipment; plywood sheathing at exterior walls.

2. Miscellaneous Wood Framing and Blocking: Provide lumber for miscellaneous wood framing, blocking, cant strips, nailers, etc. for all work of the Project, including, but not limiting to, handrails, railings, roofing, flashing, sheet metal work, wall mounted toilet accessories, Dressing Room counters, and the like.

3. General Carpentry Material Schedule shall be as follows:

| Item | Grade | Species |
|---|---|---|
| Lumber 2 in. nominal thickness or greater | Construction Grade | Spruce-Pine-Fire |
| Lumber less than 2 in. nominal thickness | Construction Grade | Spruce-Pine-Fire |

4. Pressure Preservative Treated Lumber: Pressure preserve wood products using only Arsenic and Chromium-free products in accordance with ACQ Preserve Standard ACQ-99. Pressure preservative treat lumber above ground and in contact with roofing, flashing, sheet metal, masonry, concrete, dampproofing, and waterproofing in conformance with AWPA C1, C2, C5, C9, C15, C17, and P5 as applicable. Provide pressure preservative treated lumber with a minimum net retention of 0.25 pcf. Dry lumber to maximum moisture content of 19% after treatment. Use only waterborne preservatives which conform to AWPA P5. Creosote preservatives and preservatives containing Arsenic or Chromium are not acceptable.

   a. Pressure preservative treat lumber in contact with ground in compliance with AWPA C2 and AWPB LP-22 with a minimum net retention of 0.40 pcf.

5. Construction Panels: Construction panels required to complete the work of this Section include, but is not limited to the following:

   a. Electrical and telephone equipment backing panels, consisting of APA trademarked, Performance-Rated sheathing, UL fire-retardant treated, C-D Plugged, Exposure 1 panels, not less than 5/8 in. thick. Provide fire-retardant treatment which yields a flame spread rating of not more than 25 when tested in conformance with ASTM E 84, and conforms to AWPA C 27, Interior Type A. Kiln dry after treatment to a maximum moisture content of 15%.

b. Exterior Plywood Sheathing: Provide plywood sheathing consisting of APA trademarked, Performance-Rated sheathing, UL fire-retardant treated, C-D Plugged, Exposure 1 panels, not less than 5/8 in. thick. Provide fire-retardant treatment which yields a flame spread rating of not more than 25 when tested in conformance with ASTM E 84, and conforms to AWPA C 27, Interior Type A. Kiln dry after treatment to a maximum moisture content of 15%.

6. Inserts, Anchors, and Fasteners: Provide inserts, anchors, anchor bolts, lag bolts, screws, washers, nuts, nails, and other rough hardware. Assist other trades as necessary in the placement of inserts and anchor bolts in concrete and masonry. Furnish full instructions regarding locations, sizes, and other requirements to ensure proper preparation. Provide rough hardware which complies with requirements of the governing laws and codes.

7. Rough Hardware: Provide rough hardware items for use at roof and other exterior uses hot-dip galvanized in accordance with ASTM A 153. Provide other concealed items cadmium plated or zinc chromate plated.

-END OF SECTION-

SECTION 062000

FINISH CARPENTRY

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide all finish carpentry and millwork as indicated on the Drawings and as specified herein. Include, but do not limit to:

1. Interior standing and running trim.
2. Solid surface countertops with undermount stainless steel sinks.

1.02 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.

1. American National Standards Institute (ANSI):

| | |
|---|---|
| A161.2 | Performance Standards for Fabricated High Pressure Decorative Laminate Countertops |
| A208.1 | Particleboard, Mat-Formed Wood |

2. American Society for Testing and Materials (ASTM):

| | |
|---|---|
| E 84 | Surface Burning Characteristics of Building Materials |

3. National Electric Manufacturers Association (NEMA):

| | |
|---|---|
| LD 3 | High Pressure Decorative Laminates |

4. The Architectural Woodwork Institute (AWI):

| | |
|---|---|
| Quality Standards | Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program |

1.03 QUALITY STANDARDS

A. Quality Standard: Provide work complying with applicable requirements of AWI Quality Standards. Where not otherwise indicated, fabricator may choose among options permitted by AWI for grade of work specified.

1. Panel Products: Provide minimum 45 pounds per cubic foot medium density fiberboard. Do not use hardboard.
2. Fire Performance: All concealed work in this section shall be UL labeled fire-retardant treated. Exposed woodwork shall have a flame spread of less than 200 when tested in compliance with ASTM E 84.

C. Mockups required for each type of construction.

## PART 2 PRODUCTS

### 2.01 INTERIOR STANDING AND RUNNING TRIM

A. Quality Standard: Provide AWI Premium Grade materials and workmanship.

B. Wood Species and Cuts: Provide as follows:

1. Paint Finished Work: FSC Certified Poplar.

### 2.02 SOLID SURFACING MATERIAL

A. Basis-Of-Design: Provide Staron Sheet and Staron Sinks and Bowls, as manufactured by Samsung Chemical USA, Inc.; or one of the following solid surfacing materials, or Architect approved equal, in color selected by Architect:

1. Staron Sheet; Samsung Chemical USA, Inc.
2. Corian by DuPont.
3. Fountainhead; Nevamar Corporation; Odenton, MD 21113.

B. Scope: Solid surfacing work includes, but is not limited to:

1. Countertops.
2. Vanities.

C. Provide solid surfacing material in sizes, profiles, and configurations indicated on Drawings. Color shall be standard color selected by Architect. Thickness shall be as indicated on Drawings.

D. Vanities shall include undermounted stainless steel sinks

END OF SECTION

SECTION 064000

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide architectural woodwork as shown on Drawings and specified herein. Work of this Section includes, without limitation, the following:

1. Custom plastic laminate casework and sills.
2. Custom plastic laminate paneling.
3. Custom plastic laminate benches.
4. Upholstered cushions for benches.
5. Wood handrails.

1.02 REFERENCES

A. Comply with applicable requirements of following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. American National Standards Institute (ANSI):

| | |
|---|---|
| A161.2 | Performance Standards for Fabricated High Pressure Decorative Laminate Countertops |
| A208.1 | Particleboard, Mat-Formed Wood |

2. American Society for Testing and Materials (ASTM):

| | |
|---|---|
| E 84 | Surface Burning Characteristics of Building Materials |

3. The Architectural Woodwork Institute (AWI):

| | |
|---|---|
| Quality Standards | Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program |

1.03. QUALITY ASSURANCE

a. Mockups for each form of construction.

PART 2 PRODUCTS

2.01 PLASTIC LAMINATE CASEWORK

A. Basis-Of-Design: Plastic laminate types, colors and textures are based on those manufactured by Aborite. Provide these products, or equal from one of the following, or equal:

1. Aborite.
2. Formica.

3. Nevamar.
4. Wilsonart.

B. Scope: Custom plastic laminate casework includes, but is not limited to, the following:

1. Cabinets.
2. Cubbies.
3. Display cases.
4. Benches and seats.
5. Wall paneling.
6. Miscellaneous plastic laminate casework.

B. Quality Standard: Provide AWI Premium Grade materials and workmanship. Provide exposed facing materials as follows:

1. Provide vertical grade high pressure plastic laminate for both sides of swinging and sliding doors, drawer fronts, and all exposed cabinet ends.
2. Color/Texture/Pattern: Provide laminates in colors, textures and patterns selected by Architect. Up to 4 different colors of woodgrain Plastic Laminate may be selected.

C. Preparation for Related Work: Prepare casework for all related electrical, telephone, mechanical, and plumbing work.

D. Medium-Density Fiberboard (MDF) Cores for Laminated Products: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde. Provide Sierra Pine's "Medex," "Medex NC," and "Medite II" or Weyerhaeuser's "Premier Plus" fiberboard, or equal.

1. Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

E. Cabinets and Casework: Provide casework matching elevations and details indicated. Provide cabinets having the following features and characteristics:

1. Construction/Style: Provide overlay construction with flush doors and drawer fronts, unless otherwise detailed. Provide cabinets with sliding/swinging doors, with interior cabinet surfaces to be melamine. Cabinets without doors shall have interior surfaces of plastic laminate. Provide solid Maple hardwood noses, or vinyl edges as detailed.
2. Typical Doors: Provide minimum 3/4 in. MDF with both faces plastic laminate adhered to core. Provide plastic laminate on all edges as detailed.
3. Lumber Core Doors: At locations indicated, provide minimum 3/4 in. lumber-core doors with both faces plastic laminate adhered to core. Provide plastic laminate on all edges as detailed.
4. Drawers: Provide cabinet drawers with applied drawer fronts.
5. Shelves: Provide minimum 3/4 in. MDF with laminate both sides, top and bottom; and edges finished with vinyl nosing or solid Maple nosing as indicated. All shelves shall be adjustable as detailed and shall meet AWI standards for deflection.

F. Plastic Laminate Casework Hardware: Provide the following or Architect approved equal:

1. Hinges: Provide heavy-duty overlay hinges. Provide at least two hinges per door leaf.
2. Drawer and Door Pulls: Integral or continuous pulls as detailed.
3. Drawer Slides: 75 lb. Accuride C3800, or equal manufactured by Blum or Hafele.
4. Door Silencers: Glynn Johnson GJ-65, or equal manufactured by Blum or Hafele.

Provide resilient pads to silence door and drawer closing.

5. Plastic Tracks and Guides for Sliding Doors: Basis-Of-Design shall be Knape & Vogt #P2417; color as selected by Architect, or equal from Hafele or Rakks.
6. Pegs for Adjustable Shelving: Basis-Of-Design shall be Knape & Vogt #331; color as selected by Architect, or equal from Hafele or Rakks.
7. Storage Cabinet Lock: Basis-Of-Design shall be Shlage Cabinet Door Lock #CL100PB, bright brass 605 finish; or equal from Best or Russwin.
8. Cubby Hook: Basis-Of-Design shall be Hewi Series 477 Triple Hook; or equal from Hafele or Bobrick.
9. Aluminum Grille: Provide 1/8 in. perforated aluminum, finished to match Satin Bronze. Peroration pattern shall be as selected by Architect.
10. Coat Rod: Basis-Of-Design shall be Knape & Vogt #660; with #734 and #735 tubing flange, or equal from Hafele or Rakks.

G. Upholstered Cushions: Provide upholstered cushions whose fire performance characteristics comply with Business and Institutional Furniture Manufacturer's Association Standard F-1. Provide padding covered by fabric sewed into boxed construction without welts and attached by slipping over foam cushion with zippers on least visible edge. Accurately match fabric pattern at seams. Provide double sewn seams with interlocking stitches and overlapped fabric.

1. Foam Cushions: Provide Dynamic Systems, Inc. as manufactured by Sunmate (www.sunmatecushions.com/sunmate.php). Provide medium pressure quality.

2. Upholstery Fabric for Seat and Seat Backs: Knoll Textiles fabric “Field Day” (K124); or equal by Maharam or Guilford.

2.02 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated, FSC Certified softwood lumber, kiln dried to less than 15 percent moisture content.

B. Exposed Hardwood for Wood Handrails, and Elsewhere as Indicated: AWI Premium Grade, FSC Certified, White Maple, Quarter sawn.

C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

D. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

1. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with South Coast Air Quality Management District (SCAQMD) Rule 1168, Adhesive and Sealant applications.

E. Plastic Glazing: Furnished under section 088000, GLAZING.

2.03 SHOP FINISHING

A. Grade: Provide finishes of same grades as items to be finished.

B. General: Finish exposed wood components of architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, toning, cleaning, and polishing until after installation.

C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing exposed wood components of architectural woodwork, as applicable to each unit of work.

D. Transparent Finish:

1. Grade: Premium.
2. AWI Finish System: TR5-Catalyzed Vinyl.
3. Staining: Match approved sample for color.
4. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.
5. Toner: Provide applications of toner as required or as field directed by Architect in order to ensure that finished Architectural Woodwork and wood doors matches in colors and tones.
6. Colors: Match Architect's samples.
7 Preparation for Finishing: Comply with AWI Quality Standards for sanding, filling, countersinking, sealing of concealed surfaces, and similar preparation requirements for finishing of work of this Section.

END OF SECTION

## SECTION 071613 – BITUMINOUS DAMPPROOFING

1. Description of Work: Provide below-grade bituminous dampproofing at foundation walls.

2. Dampproofing Product: Asphalt-based emulsions recommended by the manufacturer for dampproofing use when applied according to the manufacturer's instructions.

   a. Spray Grade: Emulsified asphalt, prepared with mineral-colloid emulsifying agents without fibrous reinforcement, complying with ASTM D 1227, Type III.

3. Protection Course: ASTM D 6506, 1/8-inch- (3-mm-) thick, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.

-END OF SECTION-

SECTION 072100

THERMAL INSULATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide building insulation work as indicated on Drawings, and as specified, including but not limited to:

1. Rigid extruded polystyrene foundation insulation.
2. Stone wool exterior wall insulation
3. Underslab insulation.
4. Installation of Sound-Absorbing Insulation at Acoustical Metal Deck.

PART 2 PRODUCTS

2.01 RIGID EXTRUDED POLYSTYRENE INSULATION

A. Extruded-Polystyrene Board Foundation Wall and Underslab Insulation: Provide extruded polystyrene insulation conforming to ASTM C 578, minimum 25 lbs. per sq. in. compressive strength at 0.1 in. deformation, 2.0 lbs. per cu. ft. density "K" factor of 0.185 at 40$^{O}$F. and 0.20 at 75$^{O}$F. per in. thickness, water vapor transmission of 1.0 perm, and water absorption by volume of 0.1%.

1. Provide one of the following products, or equal:
   a. DiversiFoam Products.
   b. Dow Chemical Company.
   c. Owens Corning.
   d. Pactiv Building Products Division.

2. R-Values: Provide the following minimum R-Values:
   a. Underslabs on Grade: Minimum R=10.
   b. Foundation Walls: Minimum R=10.

2.02 STONE WOOL EXTERIOR WALL INSULATION

A. Provide non-combustible, lightweight and water repellent, semi-rigid insulation board, for use in cavity wall applications. Stone wool insulation shall be in compliance with FM Global Data Sheet 1-12. Provide one of the following, or equal:
1. CavityRock® DD; as manufactured by Roxul, Inc.
2. Rainbarrier 45; as manufactured by Thermafiber
3. Owens-Corning equal.

B. Mechanically Adhesively Attached, Spindle-Type Anchors (Stick-Pins): Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated.
1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square. Plate shall have 2 screws each.
2. Spindle: Copper-coated, low carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.
3. Mastic adhesive shall have a VOC content not more than 80 g/L.

END OF SECTION

SECTION 072720

AIR AND VAPOR BARRIERS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Work Included: Provide continuous air and vapor barrier system at exterior wall assemblies as indicated on the Drawings, including connections with adjacent materials and air barrier at roof.

The air and vapor barrier membrane shall be located, constructed and flashed to perform as an air and water barrier to discharge to the outside any incidental condensation or water penetration. The air and vapor barrier membrane shall accommodate movements of building materials by providing expansion and control joints, with appropriate air and vapor seal materials at such locations, changes in substrate and perimeter conditions.

PART 2 PRODUCTS

2.01 FLUID-APPLIED MEMBRANE AIR AND VAPOR BARRIER MATERIALS

A. Fluid-Applied, Vapor-Retarding Membrane Air Barrier: Elastomeric, modified bituminous or synthetic polymer membrane.

1. Products: Subject to compliance with requirements, provide one of the following, or equal:

a. Elastomeric, Modified Bituminous Membrane:

1) Henry Company; Air-Bloc 06 WB.
2) Meadows, W. R., Inc.; Air-Shield LM.
3) Tremco Incorporated, an RPM company; ExoAir 120SP/R.

b. Synthetic Polymer Membrane:

1) Grace, W. R., & Co. - Conn.; Perm-A-Barrier Liquid.
2) Henry Company; Air-Bloc 32.

2. Physical and Performance Properties:

a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
b. Vapor Permeance: Maximum 0.1 perm (5.8 ng/Pa x s x sq. m); ASTM E 96/E 96M.
c. Ultimate Elongation: Minimum [500] <Insert number> percent; ASTM D 412, Die C.

2.02 AUXILIARY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.

B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, cross-laminated polyethylene film with release liner backing.

D. Butyl Strip To Terminate Air Barrier to EPDM or TPO Roofing Membranes: Vapor retarding, 30 to 40 mils (0.76 to 1.0 mm) thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.

E. Modified Bituminous Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.

F. Joint Reinforcing Strip: Air-barrier manufacturer's glass-fiber-mesh tape.

G. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

H. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.

I. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0250 inch (0.64 mm) thick, and Series 300 stainless-steel fasteners.

J. Sprayed Polyurethane Foam Sealant To Fill Gaps at Penetrations and Openings: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

K. Modified Bituminous Transition Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.

L. Elastomeric Flashing Sheet: ASTM D 2000, minimum 50- to 65-mil- (1.3- to 1.6-mm-) thick, cured sheet neoprene with manufacturer-recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.

M. Preformed Seal for Openings in Wall: Manufacturer's standard system consisting of cured low-modulus silicone or fiberglass, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding to substrates.

1. Products: Subject to compliance with requirements, provide one of the following, or equal:

1. Dow Corning Corporation; 123 Silicone Seal.
2. Momentive Performance Materials Inc.; US11000 UltraSpan.
3. Pecora Corporation; Sil-Span.
4. Tremco Incorporated, an RPM company; Spectrem Simple Seal or Proglaze.

N. Joint Sealant: ASTM C920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O.

END OF SECTION

**SECTION 074233 – Phenolic Wall Panels**

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Exterior solid phenolic cladding panel system and accessories as required for a complete drained and back-ventilated rainscreen system.

1. Wall panels.
2. Horizontal soffits.

B. National Fire Protection Association (NFPA):
1. NFPA 268 - Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
2. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary panel products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

B.

C. Mock-Up: Provide a mock-up for evaluation of the product and application workmanship.
1. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

1.3 WARRANTY

A. Warranty: At project closeout, provide manufacturer's limited ten year

warranty covering defects in materials.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Basis of Design: Trespa International B.V.; P.O. Box 110, 6000 AC Weert Wetering 20, 6002 SM Weert The Netherlands; www.trespa.com.

### 2.2 WALL PANELS

A. Solid Phenolic Wall Panels: Trespa Meteon by Trespa International.
   1. Material: Solid panel manufactured using a combination of high pressure and temperature to create a flat panel created from thermosetting resins, homogenously reinforced with wood-based fibers and an integrated decorative surface or printed décor.
   2. Color: As selected by the Architect from manufacturer's standard color palette.
   3. Finish: Satin sheen.
   4. Panel Core: Fire retardant (FR) black core.
   5. Panel Thickness: 3/8 inch (10 mm).
   6. Fire Performance:
      a. Flame Spread: Class A, ASTM E 84.
      b. Smoke Development: Less than 450, ASTM E 84.
   7. Finish Performance: in conformance with the following general requirements:
      a. Weather Exposure: Accelerated - 3000 hours in Atlas Type Weatherometer using cycle of 90 minutes light and 30 minutes diminished light and demineralized water with a maximum color change of 5 Delta E units from the original color according to ASTM D-2244,
      b. Color Stability: The decorative surface comply with, classification, 4 - 5 measured with the grey scale according to ISO 105 A02-93 according to test method EN 438-2:29.
      c. Microbial Characteristics: Will not support micro-organic growth (ISO 846).

B. Mounting System:

1. TS220 - Concealed fastening over variable depth aluminum sub-framing.

C. Aluminum Sub Structure: Aluminum sub-structure designed to withstand structural loading due to wind load and the dead load of the panel, painted as required to conceal behind the open joinery of the attachment system.

1. Extrusions, including corner closures, joint closures and vent screens, formed members, sheet, and plate shall conform with the recommendations of the manufacturer.

-END OF SECTION-

## SECTION 075300 – SINGLE PLY MEMBRANE ROOFING

1. Work Included: The scope of work includes:

   a. Fully-adhered single ply, reinforced thermoply roofing membrane.
   b. Roof flashings.
   c. Roof insulation at membrane roofing.
   d. Zinc-coated copper flashing.
   e. Roof pavers.

2. Manufacturers: Provide Thermoplastic PVC Sheet, uniform, flexible sheet formed from thermoplastic PVC, and as manufactured by one of the following:

   a. Sarnafil.
   b. Carlisle SynTec, Inc.
   c. Johns Manville

3. Roof System: Provide Sarnafil G410 membrane as manufactured by Sarnafil, 60-mil thick reinforced.

   a. Provide thermoply roofing system consisting of adhered single-ply PVC sheet and mechanically-attached insulation over roof deck. Provide system conforming to UL Class A and Factory Mutual Class 1. Roof system shall conform to Factory Mutual Windstorm Resistance Classification I-90.

   b. Membrane Color: Provide white membrane color.

4. Isocyanurate Board Roof Insulation: Provide indicated thickness of flat and tapered rigid isocyanurate foam roof insulation consisting of isocyanurate integrally laminated on top and bottom with non-reflective facer. Provide insulation conforming to Fed. Spec. HH-I-1972, and that is acceptable to roofing system manufacturer.

   a. Rigid isocyanurate shall have minimum density of 2 lb. cu. ft., minimum compressive strength (ASTM D 1621) of 25 psi, maximum moisture vapor transmission (ASTM E 96) of 2.0 perm, "C" factor of 0.16 (1 in.) or better, and "R" value of 6.67 (1 in.).

   b. Insulation shall be approved by Factory Mutual (FM) for Class 1 Insulated Steel Deck Construction and shall be UL listed Class A.

**5.** Underlayment Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, **5/8 in.**

   a. Product: Subject to compliance with requirements, provide "Dens-Deck" by Georgia-Pacific Corporation, or designer approved equal.

6. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, **1/2 in.** thick.

   a. Product: Subject to compliance with requirements, provide "Dens-Deck" by Georgia-

Pacific Corporation, or designer approved equal.

7. Roof Vapor Retarder: Provide Griffolyn TX-1200 FR, manufactured by Reef Industries, Inc., Houston, TX 77275, or Designer approved equal.

   a. Weight: 43 lb. per 1,000 sq. ft.; per ASTM D 2776.
   b. Permeance: 0.035 grains; per ASTM E 96.
   c. Tensile Strength: 100 lb./4,504 PSI; per ASTM D 882.
   d. Puncture Strength: 36 lb.; per ASTM D 4833.

8. Membrane Flashing: Provide manufacturer's standard PVC membrane flashing material, compatible with roofing sheets.

9. Flexible Walkways: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway **pads or rolls**, approximately 3/16 in. thick, and acceptable to membrane roofing system manufacturer.

-END OF SECTION-

## SECTION 076200 - SHEET METAL FLASHING AND TRIM

1. Work Included: The scope of work includes:

   a. Roof and Wall flashings.

2. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

   a. Aluminum Finish: Fluoropolymer Two-Coat System; Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer, and fluoropolymer color coat, with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.

      1) Color: Provide standard color, selected by Architect.

3. Formed Roof Edge Units: Provide prefabricated metal roof edge units consisting of formed hot-dip galvanized sheet steel cleats and 0.063 in. thick aluminum cap equal to "Permasnap Gravel Stops", manufactured by W.P. Hickman Co.; "Snap-Lok Gravel Stops", manufactured by MM Systems Corp.; or "AP Snap-Tight Gravel Stops", manufactured by Architectural Products Company.

4. Elastomeric Flashing: Elastomeric sheet flashing/membrane shall be polyethylene reinforced sheet flashing 60 mil thick rubberized asphalt sheet, equal to Perm-A-Barrier Wall Flashing, manufactured by W. R. Grace & Company, or approved equal.

   a. Material shall be 40 mil thick consisting of 8 mil thick high-strength cross-laminated polyethylene integrally bonded to 32 mil thick layer of rubberized asphalt.

5. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

6. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.

7. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."

8. Paper Slip Sheet: 5-lb/square red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.

9. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

10. Fabrication, General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

-END OF SECTION-

## SECTION 078410 - THROUGH PENETRATION FIRESTOP SYSTEMS

1. Work Included: Provide firestop systems consisting of a material, or combination of materials, installed top retain the integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, or gases through penetrations in fire-rated barriers. Firestops shall be used in locations including, but not limited to, the following:

    a. Penetrations for the passage of duct, cable, cable trays, conduit, piping, electrical busways, and electrical raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor slabs and floor/ceiling assemblies), and vertical service shafts.
    b. Openings between structurally separate sections of walls or floors.
    c. Above walls or partitions extending to underside of ceiling or roof assemblies above.
    d. Concealed furring spaces behind finishes.
    e. Where pipes, conduits, ducts, and other items pass through fire-rated assemblies.
    f. Openings for items mounted on or within fire-rated assemblies.

2. UL Listed Designs: Firestopping materials and systems shall be installed in each location and type of installation conforming to listed UL designs.

    a. Firestopping materials shall be UL Classified as "Fill, Void, or Cavity Material" for use in through-penetration firestop systems.

    b. Provide firestop systems that are UL listed with a fire-resistance rating equal to the hourly resistance rating of the fire-rated barrier being penetrated.

3. Fire-Resistance: Provide materials and construction identical to fire-rated assemblies tested in compliance with ASTM E 119, ASTM E 814, UL 263, or NFPA 251, by independent agencies acceptable to Designer and governing authorities.

4. Burning Characteristics: Provide products with maximum ASTM E 84 surface burning characteristics of flame spread 25 and smoke developed 25.

5. Firestop systems shall have been tested in accordance with ASTM E 814 or UL 1479 under a minimum positive pressure of 0.01 in. of water.

-END OF SECTION-

## SECTION 079200 - JOINT SEALANTS

1. Description of Work: Work includes the following:

   a. Joint sealing of joints in exterior construction.
   b. Joint sealing of interior joints.

2. Self-Leveling Joint Sealants: Provide two or more part, self-leveling, polyurethane based elastomeric sealant, complying with ASTM C 920, FS TT-S-00227E Type 1 Class A, having Shore A hardness of not less than 30 when tested according to ASTM C 920, cured modulus of elasticity at 100% elongation of not more than 150 psi when tested according to ASTM D 412, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D 624.

   a. Provide one of the following products that meet or exceed specified requirements:

      1) Pecora Urexpan NR-200.
      2) Mameco Vulkem 245 or 255.
      3) Sika 2C, SL.
      4) Sonneborn Sonolastic PvJtSt.
      5) Tremco THC 900.

   b. Extent: Provide self-leveling polyurethane sealant for paving and floor joints not indicated to be sealed with another type of sealant.

3. Non-Sag Joint Sealants: Provide multi-part, non-sag, polyurethane based elastomeric sealant, complying with ASTM C 920 Type M, Grade NS, Class 25, Fed. Spec. TT-S-00227E Class A, having Shore A hardness of 20 to 30, cured modulus of elasticity at 100% elongation of not more than 75 psi, and tear resistance of not less than 50 lbs./inch when tested according to ASTM D 624.

   a. Provide one of the following products that meet or exceed specified requirements:

      1) Mameco International Vulkem 227
      2) Sika Sikaflex 2c NS.
      3) Sonneborn Sonolastic NP 2.
      4) Tremco Dymeric

   b. Extent: Provide non-sag polyurethane sealant for all metal to metal joints, metal to concrete joints, metal to metal window joints, wood to metal joints, wood to wood joints, and other joints not indicated to be sealed with another type of sealant.

4. Silicone Rubber Sealants: Provide one part, silicone rubber based elastomeric sealant, complying with ASTM C 920 Type S, Class 25, Grade NS and Fed. Spec. TT-S-001543A Class A.

   a. Provide one of the following products or approved equal:

      1) Dow 786.
      2) General Electric 1702 Sanitary.
      3) Pecora 863.
      4) Rhodorsil 6b White.
      5) Sonneborn OmniPlus.
      6) Tremco Proglaze.

b. Extent: Provide silicone rubber sealant for interior joints around plumbing fixtures and tile to tile joints in ceramic tile work.

5. Acrylic Latex Sealants: Provide permanently flexible, latex rubber modified acrylic emulsion sealant, complying with ASTM C 834.

a. Provide one of following products or approved equal:

1) Pecora AC-20
2) Tremco Acrylic Latex 834
3) Sonneborn Sonolac

b. Extent: Provide acrylic latex sealant for use at mirrors, for exposed acoustical sealant, and for interior joints except where silicone rubber sealant is indicated.

6. Miscellaneous Sealant Materials: Provide as follows:

a. Primer: Provide primer recommended by sealant manufacturer for surfaces to be adhered to.

b. Bond Breaker Tape: Provide polyethylene or other plastic tape recommended by sealant manufacturer to prevent three-sided adhesion.

c. Sealant Back-Up Rod: Closed-cell, non-gassing, polyethylene rod "Ethafoam" by Dow Chemical Co. or approved equal. The diameter of the rod shall be approximately 25 percent in excess of joint width. Surface skin of rod shall be continuous and unbroken and of sufficient thickness to preclude outgassing and formation of voids in the overlying sealant.

d. Foamed-In-Place Sealant: Provide two-component polyurethane foam, UL Fire Hazard Classification Class I, consisting of polymeric isocyanurate and polyether polyol components, pressurized with nitrogen, and dispensed from portable, self-contained insulation frothing kit, equal to "Froth-Pak" by Insta-Foam, or equal as approved by Designer.

-END OF SECTION-

## SECTION 081100 - STEEL DOORS AND FRAMES

1. Work Included: Provide steel doors and frames and related items as indicated on Drawings and as specified herein. Include, but do not limit to, the following:

   a. Interior and exterior flush doors.
   b. Interior and exterior steel frames.
   c. Door louvers.

2. Fire Doors and Frames: For doors and frames installed in fire-rated assemblies and where indicated or required by authorities having jurisdiction, provide door and frame assemblies that comply with NFPA 80, and which have been tested, listed and labeled in compliance with ASTM E 152 by an independent agency acceptable to authorities having jurisdiction.

   a. Temperature Rise Rating: Labeled fire doors within an interior exitway stairway shall have a label indicating a maximum transmitted temperature end point of not more than 450°F. above ambient at the end of 30 minutes of standard fire test exposure.

3. Hot Rolled Steel: ASTM A 568 and ASTM A 569, commercial quality, pickled and oiled.

4. Cold Rolled Steel: ASTM A 366 and ASTM 568, commercial quality carbon steel.

5. Galvanized Sheet Steel: Roller leveled commercial quality zinc coated carbon steel sheets complying with ASTM A 525, G60, mill phosphatized.

6. Exterior Work: Fabricate exterior doors and frames from galvanized sheet steel with closed tops and bottoms.

7. Faces: Fabricate exposed faces from stretcher leveled cold rolled steel.

8. Interior Doors (Non-Rated): SDI-100, Grade II, Heavy Duty, 16 gage minimum face sheets, Model 3 or 4, seamless construction.

9. Interior Doors (Fire-Rated): SDI-100, Grade II, Heavy Duty, 16 gage minimum face sheets, Model 4, with seamless mineral fiberboard composite construction.

10. Exterior Doors: SDI-100, Grade III, Extra Heavy Duty, 14 gage minimum face sheets, seamless, Model 4, maximum U-factor of 0.24 BTU/HR/$FT^2/^oF$, ASTM C 236. Frames shall be demountable at service entries.

-END OF SECTION-

## SECTION 081416 - WOOD DOORS

1. Work Included: The work of this section includes, but is not limited to, the following:

   a. Flush Wood Doors: Solid core flush wood doors with veneer faces.
   b. Stile and Rail Wood Doors: Solid stile and rail wood doors wood panels.
   c. Prefitting and premachining of wood doors.

2. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

3. Solid Core Wood Doors, General: AWI PC-5 construction as specified in AWI Quality Standards Section 1300-G-3. Core, stiles, and rails shall be glued together before sanding. Wood for stiles and rails shall be thoroughly seasoned, kiln-dried stock with 5% to 8% moisture content. Exposed wood door edges of stiles and rails for doors to receive transparent finish shall be same species and cut of wood to match face veneers.

   a. Core for non-fire-rated doors shall be lumber staves, edge-glued, kiln-dried softwood lumber of single species, with horizontal joints staggered in contiguous rows.
   b. Core for fire-rated doors shall be manufacturer's standard mineral core conforming to ANSI A208.1, Algoma Weldrok core, or approved equal.
   c. Crossbands shall be 1/16 in. thick hardwood, full width of door, with grain at right angle to face veneer grain.
   d. Veneers for transparent finishes shall be Premium Grade Select Quarter-Sawn FSC-Certified White Maple, at least 1/50 in. thick, adhered to 1/16 in. hardwood crossband, core, rails, and stiles by hot press method. Provide veneers book matched, balance matched, and pair matched.

4. Mineral Core Flush Wood Fire-Rated Doors: Flush wood-faced mineral core doors, 1-3/4 in. thick, five-ply, with crossbanding and face veneers bonded to both faces, of fire-rated construction, equal to Superstile Edge Architectural Wood Composite Fire Door manufactured by Algoma Hardwoods, Inc. or approved equal doors by above listed manufacturers. Provide blocking for hardware so that screws fasten into hardwood for entire length. Furnish UL Label of indicated Class and Hour rating affixed to hinge jamb of each door.

5. Solid Core Flush Interior Wood Doors: Flush type, Algoma Grade Novodor of five-ply construction with crossband and veneers bonded to both faces. Doors shall be 1-3/4 in. thick.

6. Solid Stile and Rail Interior Wood Doors: Interior doors complying with WDMA I.S.6, "Industry Standard for Wood Stile and Rail Doors," fabricated from FSC-Certified White Maple.

7. Factory Finishing of Wood Doors: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

   a. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
   b. Finish doors at factory.
   c. Transparent Finish:

1) Grade: Premium.
2) Finish: AWI catalyzed polyurethane system.
3) Staining: As required to match Architectural Woodwork.
4) Effect: Filled finish.
5) Sheen: Satin.

-END OF SECTION-

## SECTION 083113 - ACCESS DOORS AND FRAMES

1. Description of Work: Furnish access doors and access panels for installation under work of other Sections as indicated on Drawings and as specified.

2. Access Doors and Panels: Furnish metal access doors and panels for access to valves, damper controls, pipes, conduits, switches, regulators, etc., to the proper trades for building into the work, except that any access panels specifically specified under the Mechanical or Electrical Sections of the Specifications to be furnished by those trades are excluded from the work of this Section.

3. Furnish flush-type access doors, 18 ga. minimum thickness specially designed for each type of wall and ceiling finish and construction with which used, with factory-applied prime finish, as manufactured by Karp Associates, Inc., Birmingham Ornamental Iron Co., Miami-Carey, Babcock-Davis, or equal approved by Architect. Refer to Architectural, Mechanical, and Electrical Drawings for locations, sizes, and materials with which used.

    a. Where installed at fire-rated walls or ceilings access panels shall be of fire-resistive construction and shall bear the U.L. 2-hr. label.

    b. Where installed in surfaces finished with ceramic tile, access panels shall be stainless steel with No. 4 finish.

    c. Where installed in drywall construction, access panel frames shall be flush edge-frame type, designed for drywall insert.

    d. Access panels shall have concealed hinges.

-END OF SECTION-

## SECTION 083340 - OVERHEAD COILING GRILLES

1. Work Included: Work of this Section consists of furnishing all labor, materials, equipment, and services necessary to complete the work indicated, and without limiting the generality thereof includes:

   a. Electrically operated overhead coiling grilles.
   b. Hand operated horizontal “curtain type” grilles

2. Overhead coiling grilles shall be linked-rod type, up-rolling, manufactured by Atlas Door Corp., Edison, NJ 08818, equivalent products of Kinnear Walter Balfour and Co., Inc., Cookson Co., or Cornell Iron Works, Inc., or approved equal.

3. Grille Curtain: Grille curtains shall be straight-linked rectangular design, constructed of horizontal aluminum rods not less than 5/16 in. diameter, continuous from jamb to jamb and spaced not more than 2 in. on center. Rods shall be held in position by aluminum links in rectangular grid pattern, spaced not more than 9 in. on center. The ends of each horizontal rod shall be secured to an end link to lock the curtain in the guides. Bottom of curtain shall be equipped with aluminum angle or tube rail.

4. Guides: Guides shall be formed of aluminum and shall be provided with wood or vinyl pipe stripping on both sides to reduce noise and friction.

5. Electrical Operation: Equip coiling grilles with manufacturer's standard electrical operator specially designed for size, type, and operation of coiling grille, operating from 208 V, 3 phase, 60 HZ power sources as indicated on Drawings. Locate operator to clear obstructions. Operator shall be UL listed. Equip each operator with remote control switch to be installed and connected under Division 26, ELECTRICAL at locations indicated on Drawings. Provide key operated controls for each grille. Keying shall be as directed by Owner.

END OF SECTION

## SECTION 084113 - ALUMINUM ENTRANCES AND STOREFRONTS

1. Work Included: Provide aluminum entrances and storefront work as indicated on the Drawings and as specified herein, including, but not limited to the following:

   a. Storefront framing systems.
   b. Entrance and vestibule doors.

2. Manufacturers: Provide storefronts and entrance systems of one of the following manufacturers that meet or exceed requirements of these specifications:

   a. EFCO
   b. Kawneer Company, Inc.
   c. Tubelite Div., Indal Inc.
   d. United States Aluminum Corp.

3. Aluminum Members: Provide 6063-T5 alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish. Comply with ASTM B 221 for extrusions, and ASTM B 209 for sheet/plate. Provide 0.125 in. thick extrusions for door stiles and storefront framing. Provide 0.050 in. thick aluminum for glazing moldings.

4. Storefront Type: Storefront framing shall be Tri-Fab Series 451T, manufactured by Kawneer, or equal by Tubelite Div., Indal Inc.; EFCO; or approved equal.

   a. Thermal-Break Construction: Fabricate aluminum storefront framing system with integrally concealed, low conductance thermal barrier, located between exterior materials and exposed interior members, in manner which eliminates direct metal-to-metal contact. Provide manufacturer's standard construction which has been in use for similar projects for at least three years.

   b. Framing shall be field glazed with 1 in. float glass or tempered glass (where required by law). Glass and glazing is specified as work of Section 088000, GLAZING.

5. Entrance and Vestibule Doors: Aluminum doors shall be TuffLine Series 350 Medium Stile factory-glazed aluminum doors, manufactured by Kawneer Company, Inc., or approved equal.

   a. Aluminum doors shall be stile and rail type swing doors. Aluminum shall be extruded aluminum conforming to ASTM B 221, 0.1875 in. thick for door stiles and 0.050 in. thick for glazing molding.
   b. Sections shall be of sizes and profiles indicated; shall present straight, sharply defined lines and arrises; and shall be free from defects impairing strength, durability, and appearance.
   c. Corners shall be Dual-Moment welded.
   d. Each door shall be factory glazed with 1/4 in. thick, clear tempered glass at interior vestibule doors, and 1 in. thick insulating glass at exterior doors set in neoprene glazing gasket. Glass shall conform to requirements of Section 088000, GLAZING.

6. Aluminum Finish: Fluoropolymer Two-Coat System; Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer, and fluoropolymer color coat, with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.

   a. Color: Provide standard color, selected by Architect.

-END OF SECTION-

**SECTION 085113 - ALUMINUM WINDOWS**

1. Description of Work: Furnish and install aluminum window systems, as indicated on Drawings and as specified herein. Types of aluminum windows include, but are not limited to:

   a. Fixed windows.
   b. Operable awning units.
   c. Operable awning units.

2. Acceptable Manufacturers: Provide windows of one of the following manufacturers that meet or exceed specified requirements:

   a. Oldcastle Building Envelope;
   b. EFCO
   c. Kawneer.

3. General: Provide High Performance, Heavy Commercial (HC) windows complying with all specified performance requirements.

4. Types: Provide the types as indicated on the Drawings.

5. Aluminum Extrusions: Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application indicated, but not less than 22,000,000 psi ultimate strength and not less than 0.125 in. thickness at any locations.

6. Fasteners: Comply with referenced standards. Provide non-magnetic stainless steel fasteners. Provide concealed fasteners to the greatest extent possible. Provide Phillips flathead screws for exposed fasteners.

7. Weatherstripping: For awning windows, provide manufacturer's standard compressible stripping of molded EPDM or neoprene.

8. Screens: Provide manufacturer's standard 18 x 16 stainless steel wire, 0.009 in. diameter mesh.

9. Low 'E' Coated Insulated Glass: Provide high-performance, clear, metallic coating, “Solarscreen VE1-2M” as manufactured by Viracon, or approved equal. Provide Low 'E' coating which has the following performance characteristics when applied to the No. 2 surface of 1 in. insulating units, exterior lite 1/4 in. clear, interior lite 1/4 in. clear:

   a. Visible Light Transmittance: 70%.
   b. Shading Coefficient: 0.44.
   c. Center of Glass U-Factor: 0.29 (winter); 0.26 (summer).

10. Aluminum Finish: Fluoropolymer Two-Coat System; Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer, and fluoropolymer color coat, with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.

    a. Color: Provide standard color, selected by Architect.

END OF SECTION

## SECTION 086200 - METAL FRAMED SKYLIGHTS

1. Work Included: Provide glazed aluminum-framed skylight work as indicated on Drawings and as specified. Include, but do not limit to:

   a. Design and engineering of complete skylight systems.
   b. Factory finishing of exposed aluminum members.
   c. Flashing and counterflashing of skylight system.
   d. Components and accessories required to complete framing for the skylight system.

2. Acceptable Manufacturers: Provide products of one of the following manufacturers that meet or exceed specified requirements:

   a. Bohem Skylights, Inc.
   b. EPI Architectural Systems, Inc.
   c. Fisher Skylights, Inc.
   d. Super Sky Products, Inc.
   e. Wasco Products, Inc.

3. Skylight framing sections shall be extruded aluminum conforming to ASTM B 221, 6063-T5 alloy and temper. Brake-metal work shall be sheet aluminum. Alloys and tempers of aluminum shall be as recommended by manufacturer for strength, corrosion resistance, and specified finish, but of not less than 27,000 psi ultimate tensile strength and not less than 0.109 in. (framing members) and 0.094 in. (interior and exterior caps) thickness at any location for extrusions and not less than 0.062 in. thick for sheet metal.

4. Glazing Gaskets: Shall be extruded neoprene glazing with Shore A Hardness of 45 to 55 durometer.

5. Clear Tempered Glass: ASTM C1048, Condition A-Uncoated, Type I-Transparent, Flat, Class 1-Clear, Quality q3, Kind FT.

6. Sloped Insulating Glass: Provide factory assembled units of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space, complying with ASTM E 774, and as follows:

   a. Sealing System: Dual Seal.
   b. Primary Sealant: Polyisobutylene.
   c. Secondary Sealant: Silicone, General Electric ISG 3204 or ISG 3100, Rhodorsil Rhodortherm 542 0r 543, or Dow Corning 982.
   d. Spacer: Clear finish aluminum with welded, soldered, or bent corners.
   e. Dessicant: Molecular sieve, or silica gel, or blend of both.
   f. Air Space: 1/2 in.
   g. Outer Pane: Clear Tempered Glass, with Low 'E' coating on #2 surface.
   h. Inner Pane: Translucent Laminated Safety Glass.

7. Aluminum Finish: Fluoropolymer Two-Coat System; Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer, and fluoropolymer color coat, with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.

   a. Color: Provide standard color, selected by Architect.

END OF SECTION

**SECTION 087100 - HARDWARE**

1. Work Included: Provide Finish Hardware to provide correct functions for intended use. Provide related items and services as indicated on the Drawings and as specified. Furnish hardware schedules and templates as required for fabrication of doors and frames under other Sections. Provide hardware that complies with applicable codes and requirements of authorities which have jurisdiction.

2. QUALITY ASSURANCE

   a. Hardware for Fire-Rated Openings: NFPA 80, and local requirements.
   b. Handicapped Accessibility: ANSI A117.1, and local requirements.
   c. Materials and Application: ANSI A156 series standards

3. PRODUCTS

   a. Door Hardware:

      1) Quality Level: Commercial type.
      2) Locksets and Latchsets: Mortise type.
      3) Lock Cylinders: Interchangeable type.
      4) Keying: Owner's requirements keying and key control system.
      5) Hinges and Butts: Full-mortise type with nonremovable pins at exterior doors.
      6) Closers, Door Control: Barrier-free type; concealed in public areas.
      7) Pivots: Offset or center-hung type.
      8) Push/Pull Units: Through-bolted type.
      9) Hardware Finishes: US 32D satin stainless steel on exposed surfaces.
      10) Electromagnetic locks and power supply coordinated with security system.
      11) Exit Devices: Concealed vertical rod, typical.

   b. Auxiliary Materials:

      1) Door Trim Units: Kickplates, edge trim, viewers, and related trim.
      2) Stops and overhead door holders.
      3) Door Silencers.
      4) Soundstripping.
      5) Weatherstripping and thresholds.
      6) Electromagnetic hold-open devices.
      7) Card-operated opening devices, including all entrance doors.

   c. Power Door Operators: Door operators for power-assisted doors.

      1) Power Units: Two-way swing door type.
      2) Operator: Electromechanical operator.
      3) Automatic Door Control: Infrared motion detector automatic controls.
      4) Manual Door Control: Rail-supported switch.
      5) Wall push-plate switch.

END OF SECTION

## SECTION 088000 - GLAZING

1. Work Included: The scope of work, includes interior glass and glazing work and exterior glass at entrances and storefronts, and includes:

   a. Interior glass for doors, sidelights, borrowed lights, etc.
   b. Exterior glass for aluminum entrances and storefronts.
   c. Mirrors.
   d. Note: Glass and glazing for skylights is specified in Section 086200, METAL FRAMED SKYLIGHTS; glass and glazing for aluminum windows are specified under Section 085113, ALUMINUM WINDOWS.

2. Clear Float Glass: ASTM C 1036 ,Type I-Transparent, Flat, Class 1-Clear, Quality q3.

3. Clear Heat Strengthened Glass: ASTM C 1048, Condition A-Uncoated, Type I-Transparent, Flat, Class 1-Clear, Quality q3, Kind HS.

4. Clear Tempered Glass: ASTM C1048, Condition A-Uncoated, Type I-Transparent, Flat, Class 1-Clear, Quality q3, Kind FT.

5. Low 'E' Coated Insulated Glass: Provide high-performance, clear, metallic coating, “Solarscreen VE1-2M” as manufactured by Viracon, or approved equal. Provide Low 'E' coating which has the following performance characteristics when applied to the No. 2 surface of 1 in. insulating units, exterior lite 1/4 in. clear, interior lite 1/4 in. clear:

   a. Visible Light Transmittance: 70%.
   b. Shading Coefficient: 0.44.
   c. Center of Glass U-Factor: 0.29 (winter); 0.26 (summer).

6. Vertical Insulating Glass: Provide factory assembled units of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space, complying with ASTM E 774, and as follows:

   a. Sealing System: Dual Seal.
   b. Primary Sealant: Polyisobutylene.
   c. Secondary Sealant: Silicone, General Electric IGS 3204 or IGS 3100, Rhodorsil Rhodortherm 542 or 543, or Dow Corning 982.
   d. Spacer: Clear finish aluminum with welded, soldered, or bent corners.
   e. Desiccant: Molecular sieve, silica gel, or blend of both.
   f. Air Space Thickness: 1/2 in.
   g. Outer Lite: Refer to Glazing Schedule at end of this Section.
   h. Inner Lite: Refer to Glazing Schedule at end of this Section.

7. Mirrors: 1/4 in., Quality q2, clear float glass with silver, copper, and organic coating, and as follows:

   a. Edges: Uniformly ground and polished.

8. General Glazing Sealant: Provide sealant with maximum Shore A hardness of 50. Provide one of the following:

a. Dow Corning 795.
b. General Electric Silglaze N 2500 or Contractors SCS-1000.
c. Rhodorsil 3B, 5C, or 6B.
d. Tremco Proglaze.

9. Weather Seal Sealant: Provide non-acid curing sealant with movement range ± 50%, ASTM C 719. Provide one of the following:

a. Dow Corning 795.
b. General Electric Silpruf.
c. Rhodorsil 3B, 5C, or 6B.
d. Tremco Spectrum 2.

10. Structural Sealant: Provide one of the following structural sealants recommended by manufacturer for structural glazing applications.

a. Dow Corning 795 or 983.
b. General Electric Ultraglaze SSG 4000 or SSG 4200.
c. Tremco Proglaze II.

11. Mirror Adhesive: Palmer's Mirro-Mastic.

12. Glass Schedule: Provide following glass types.

a. Type 1: Storefront Glazing, 1 in. thick insulating units comprised of two 1/4 in. glass lites within 1/2 in. air space, high performance low-e coating on #2 surface.
b. Type 2: 1/4 in. clear annealed glass.
c. Type 3: 1/4 in. clear tempered glass.
d. Type 4: 1/4 in. mirror glass.

-END OF SECTION-

## SECTION 089000 - METAL WALL LOUVERS

1. Work Included: Furnish and install metal wall louvers, as indicated on Drawings and as specified herein.

2. Metal wall louvers shall be the products of one of the following manufacturers, or approved equal:

   a. Construction Specialties Inc., Cranford, NJ 07016.
   b. Airolite Company, Marietta, OH, 45750.
   c. Industrial Louvers, Inc., Delano, MN 55328.

3. Aluminum Extrusions:

   a. ASTM B 221, alloy 6063-T52.
   b. Minimum Thickness: 0.081 in.

4. Fabrication: Unless otherwise indicated, exterior stormproof louvers shall be 4 in. deep, continuous blade, drainable type, with 40% minimum free air area and channel frame as indicated.

5. Construction:

   a. Assemble louvers by heli-arc welding.
   b. Arrange louvers in full height and width panels without exposed vertical mullions.
   c. Heads, sills, and jambs shall be one piece structural members.
   d. Manufacturer shall provide all necessary structural supports and bracing to carry wind load of not less than 20 psf.

6. Screens: Provide louvers with 1/2 in. mesh, 0.063 in. diameter aluminum wire intercrimp bird screens secured in removable extruded aluminum frames.

7. Aluminum Finish: Fluoropolymer Two-Coat System; Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer, and fluoropolymer color coat, with color coat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight; complying with AAMA 605.2.

   a. Color: Provide standard color, selected by Architect.

-END OF SECTION-

## SECTION 092900 - GYPSUM BOARD ASSEMBLIES

1. Work Included: Furnish and install gypsum drywall work, as indicated on the Drawings and as specified. Include, but do not limit to:

    a. Steel suspension systems for ceilings and soffits.
    b. Screwable steel stud interior partition framing.
    c. Screwable steel stud framed and furred enclosures at columns and beams.
    d. Blockings and attachments for fixture supports.
    e. Gypsum wallboard finishes.
    f. Concealed acoustical sealant work, and acoustical insulation of gypsum wallboard finishes at steel stud framed partitions and furrings where indicated.
    g. Installation of access doors.
    h. Other gypsum drywall work called for on the Drawings or reasonably required to complete the Project intent.

2. Metal Ceiling Suspension System Components: Provide components that conform to ASTM C 754 for materials and sizes, unless indicated otherwise. Provide all metal runners, hangers, studs, and channels hot-dip galvanized conforming to ASTM A 525, G60, unless noted otherwise.

    a. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, 12 gauge minimum.
    b. Hanger Rods: Where required for loading or by local authorities, provide mild-steel rods, sized as required, hot-dip galvanized.
    c. Flat Hangers: Where required for loading or by local authorities, provide mild-steel flat hangers, sized as required, hot-dip galvanized.
    d. Channels: Provide cold-rolled steel channels, minimum 16 gauge with 7/16 in. wide flanges, protected with corrosion-resistant coating, and as follows:

        1) Carrying Channels: 1-1/2 in. deep, 475 lb. per 1,000 lin. ft., hot-dip galvanized.
        2) Furring Channels: 25 ga. hot-dip galvanized, screwable, pressed steel furring channels, 7/8 in. thick, hat section.
        3) Steel Studs for Furring Channels: ASTM C 645, minimum 25 gage, hot-dip galvanized, with flange edges bent back 90 degrees and doubled over to form minimum 3/16 in. lip, depth as indicated.
        4) Resilient Channels for Mounting at Emergency Generator Room Ceiling: 1/2-inch-(13-mm-) deep, steel sheet members designed to reduce sound transmission.

            a. Configuration: Asymmetrical.

        5) Clips for attachment of steel furring channels to steel carrying channels shall be proprietary clips as recommended by manufacturer.

3. Ceiling Suspension System: Provide a complete, mechanical suspension system conforming to ASTM C 645, consisting of cold-rolled steel channel main runners, screwable steel furring channels hangers and anchors and all required clips and other components, required for complete installation.

4. Steel Stud Wall Framing Systems: Unless otherwise indicated, steel stud system for walls and partitions shall be a complete proprietary framing system consisting of prefabricated, non-load bearing, screwable 20 ga. and 25 ga. steel studs, steel track, anchors, and related

items, conforming to ASTM C 645. Provide all metal runners, hangers, studs, and channels hot-dip galvanized conforming to ASTM A 525, G60, unless noted otherwise..

a. Special system at gypsum shaft-wall construction shall be as above, except with "C-H" Type galvanized steel studs, or equivalent.
b. Provide minimum 20 gage steel studs at jambs of door and fixed glass frames, at open partition ends, and where the partition is to receive wall-mounted shelves, heavy fixtures, etc.

5. Gypsum Wallboard: Indicated thickness(es) by 48 in. width by lengths as required, tapered edge, paper finish, conforming to ASTM C 36. Where used in fire-rated assemblies, provide Type X fire resistant type.

6. Water Resistant Gypsum Backer Board: Provide water resistant type gypsum backing board conforming to ASTM C 630 at locations indicated.

7. Impact-Resistant Drywall: Where indicated, interior gypsum board partitions in public areas shall be 5/8 in. thick, tapered edge, Gold Bond Fire-Shield Type X Hi-Impact 3000 Wallboard, as manufactured by National Gypsum Co.; or equal by US Gypsum; Domtar Gypsum; or approved equal.

8. Gypsum Shaft Wall Liner: 1 in. thick solid gypsum core, in multilayered, moisture-resistant green paper, 24 in. wide by lengths as required to eliminate end joints.

9. Preformed Reveals: Preformed reveals and corners for gypsum wallboard partitions shall be equal to Softforms Commercial Grade Standard Extrusions, manufactured by Softforms Division, Pittcon Industries, Inc., or approved equal. Shapes shall be extruded 6063-T5 aluminum alloy 1/8 in. thick, minimum (profile areas). Shapes shall be primed; plaster and paints shall be capable of bonding to primed surface. Fire rating shall be Class A. Provide all required shapes and radii indicated or required to complete the work.

10. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

a. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
b. Level 2: Panels that are substrate for tile.
c. Level 5: At all wall and ceiling surfaces that will be exposed to view unless otherwise indicated.

-END OF SECTION-

## SECTION 093000 - TILING

1. Work Included: The scope of work, without limiting the generality thereof, consists of furnishing all labor, materials, plant, transportation, equipment, accessories, appurtenances, and services necessary and/or incidental to the proper completion of all tile work shown on the Drawings, described in the Specifications, or as reasonably inferred from either, in the opinion of the Architect, as being required, and includes:

A. Work of this Section includes but is not limited to:

1. Floor quarry tile.
2. Porcelain floor tile.
3. Ceramic wall tile.
4. Base tile.
5. Marble thresholds

2. Tile for Thin-Set Installation:
   a. Porcelain floor tile.
   b. Ceramic wall tile.
   c. Base tile.

3. QUALITY ASSURANCE

   a. Mockups for each form of construction.
   b. Tile Installation: ANSI 108 Series Standard Specifications and Tile Council of America, handbook for ceramic tile installation.
   c. Tile Materials: ANSI 118 series Standard Specifications.

4. MATERIALS

   a. Mortar: Latex-Portland cement for thin-set tile installation.

   b. Grout: Latex-Portland cement, color as selected by Architect.

5. TILE MATERIALS

   A. Quarry Tile: 6 in. by 6 in. by 1/2 in. thick, unglazed, natural clay quarry tile, edge ground for exact and consistent face size, with ribbed or other bonding features on back, and with non- slip abrasive grit applied to face, equal to American-Olean "Murray", Midstate Tile Co. "Quarry Tile", Summitville "Quarry Tile", or equal. Color shall be as selected by Architect.

   1. Provide matching 6 in. by 6 in. coved sanitary base with rounded or square tops as indicated.

B. Floor Tile: 1 in. Penny-Round ceramic floor tile, equal to “Complete Tile Collection” by Penny Rounds; or approved equal as manufactured by DalTile; American-Olean, Summitville, or equal. Colors shall be as follows:

1. Color: Art White, matte.

C. Ceramic Wall Tile: 4-1/4 in. by 12-3/4 in., ceramic wall tile, equal to DalTile “Modern Dimensions”; or approved equal as manufactured by American-Olean, Summitville, or equal. Color shall equal to DalTile “Matte Arctic White” 0790.

1. Provide bullnose trim pieces at all exposed edges and corners.
2. Flat-Top Cove Base: 4-1/4 in. x 8-1/2 in. to match wall tile color.

D. Ceramic Accent Tile: 1 in. Penny-Round ceramic wall accent tile, equal to “Complete Tile Collection” by Penny Rounds; or approved equal as manufactured by DalTile; American- Olean, Summitville, or equal. Colors shall be as follows:

1. CT-A1: Color 1 (Art White, gloss).
2. CT-A2: Color 2 (Iron Azul, gloss).
3. CT-A3: Color 3 (Rojo Coral, gloss).
4. CT-A4: Color 4 (Amarillo).

6. Tile Installation Methods: Install and grout tile in accordance with the provisions of the standard specification and published details hereinbefore listed, generally as follows, in accordance with TCA "Recommended Uses":

a. Floor Tile, Thinset: Latex-Portland Cement Mortar, TCA Method F113, with Latex-Portland Cement Grout.

b. Ceramic Wall Base: Latex-Portland Cement Mortar, Applied to Cementitious Tile Backerboard, TCA Method W244, with Latex-Portland Cement Grout.

-END OF SECTION-

SECTION 095113

ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide suspended acoustical ceilings as indicated on Drawings and as specified. Work of this Section includes, but is not limited to:

1. Acoustical panel lay-in ceiling with exposed suspension system.

1.02 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build minimum 10 ft. x 10 ft. mockup of each typical ceiling area.

1.03 EXTRA MATERIAL

A. Provide packaged, wrapped and labeled maintenance stock equal to 2% of the actual quantity installed for the following items of work:

1. Each type of ceiling tile and panel.
2. Each type of suspension system component.

PART 2 PRODUCTS

2.00 SUSTAINABILITY CHARACTERISTICS

A. Minimum Recycled Content defined in Section 018113 “Sustainable Design Requirements”.

1. Steel Products: 25%.
2. Acoustical Ceiling Panel Products: 35%

B. Regional Content defined in Section 018113 “Sustainable Design Requirements”. Report Regional Content only. No minimum requirement.

C. VOC content limitations defined in Section 018123 “Volatile Organic Compound Limits”.

2.01 SUSPENSION SYSTEM

A. Provide products of one of the following manufacturers that meet or exceed requirements specified, or equal:

1. Chicago Metallic Corporation
2. Donn Corporation
3. Armstrong World Industries.
4. National Rolling Mills
5. Technical Ceiling Systems

B. Narrow Exposed Suspension System: Provide manufacturers narrow exposed "Tee", commercial quality cold-rolled, electro-galvanized steel grid system, equal to Armstrong 9/16 in. Suprafine XL, complying with ASTM C 635 for "Intermediate-Duty System". Provide grid modules to match ceiling panel sizes. Provide manufacturer's standard white baked enamel finish on steel exposed surfaces.

2.03 ACOUSTICAL PANELS AND TILES

A. Provide ceiling panel and tile products of one of the following manufacturers that meet or exceed requirements specified:

1. Armstrong World Industries, Inc.
2. Celotex Corporation.
3. United States Gypsum Co.
4. CertainTeed

B. Interior Ceiling Panels, Basis-Of-Design: Provide as follows, or approved equal:

1. Typical ACT Ceiling: Provide ACT plank system in varying sizes as shown on Drawings, equal to Armstrong World Industries “Health Zone Optima” 24 in. x 24 in. (#3216); 24 in. x 48 in. (#3217); or equal products by Celotex; United States Gypsum “Mars ClimaPlus HRC; or CertainTeed “Symphony M. System shall be designed to interface with a 9/16 in. Suprafine XL grid.

2. Band and Chorus Rooms: Basis of Design USG Geometrix

3. Practice Rooms: Basis of design Armstrong Ultima

END OF SECTION

## SECTION 096446 - WOOD SPORTS-FLOOR ASSEMBLIES

1. Scope: Work of this Section includes, but is not limited to:

   a. Gymnasium strip flooring system.
   b. Field finishing of work of this Section.

2. Wood Flooring (Gymnasiums): Wood Flooring System shall be one of the following:

   a. "Rezill Channel" system, manufactured by Connor AGA, Amasa, MI 49903;
   b. “Bio-Channel” system as manufactured by Robbins Sports Surfaces, Cincinnati, OH, 45226;
   c. “AacerChannel” system as manufactured by Aacer Flooring, LLC, Peshtigo, WI 54157.

      1) Flooring system shall be tested and evaluated for Athletic Performance according to the International Standard DIN 18032, Part 2.

3. Wood Flooring Treatment And Finishing Materials: Provide as follows:

   a. Treatment: Treat all flooring with MFMA tested and listed wood preservative. Stamp each bundle with official treating plant certificate and number.

   b. Finish Materials: Provide Robbins Miracle Oil modified polyurethane sealer and finish, or Architect approved equal. Provide game-line paints as recommended by finishing materials manufacturer to be compatible with finish.

      1) Provide game lines and solid painted areas in layouts indicated, or if not indicated, as recommended by MFMA Ref. 3.

      2) Game Line and Solid Painted Area Colors: Provide game lines and solid painted areas in colors selected by Architect. Five different colors will be selected. Match Architect's color chip for each color selected.

END OF SECTION

SECTION 096500

RESILIENT FLOOR TILE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide resilient flooring and related items, as indicated on the Drawings and as specified herein. Work of this Section includes, but is not limited to:

1. Vinyl composition tile flooring.
2. Mastics and leveling compounds.

1.02 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.

1. American Society for Testing and Materials (ASTM):

| | |
|---|---|
| D 570 | Test Method for Water Absorption of Plastics |
| D 638 | Test Method for Tensile Properties of Plastics |
| D 2047 | Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces |
| E 84 | Surface Burning Characteristics of Building Materials |

2. Federal Specifications (Fed. Spec.):

| | |
|---|---|
| SS-T-312B | Tile, Floor, Asphalt, Rubber Vinyl, and Vinyl Composition |
| SS-W-40 | Wall Base; Rubber and Vinyl Plastic. |

1.03 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every type, color, and pattern of floor tile installed.

PART 2 PRODUCTS

2.01 VINYL COMPOSITION FLOORING

A. Acceptable Manufacturers: Provide products of one of the following manufacturers that meet or exceed specified requirements:

1. Armstrong World Industries, Inc.
2. Tarkett .
3. Johnsonite.

B. Basis-Of-Design Vinyl Composition Tile Type: 1/8 in. thick, 18 in. by 18 in. "Excelon Stonetex" Series, manufactured by Armstrong World Industries, Inc. or approved equal manufactured by Johnsonite or Tarkett. Tile shall meet or exceed Fed. Spec. SS-T-312B, Type IV.

1. Colors: Provide colors as follows to create patterns:

1. VCT1 = Limestone Beige 52139
2. VCT2 = Chamotte 52172
3. VCT3 = Spanish Moss 52180
4. VCT4 = Hermit Shale 52186
5. VCT5 = Golden Bamboo 52170

2. Layout: Layout of tile shall be running bond.

2.02 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

1. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with South Coast Air Quality Management District (SCAQMD) Rule 1168, Adhesive and Sealant applications
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Floor Polish: Provide protective liquid acrylic floor polish products as recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.

    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

3.03 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

3.04 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
B. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply three coats.

C. Cover floor tile until Substantial Completion.

END OF SECTION

## SECTION 096513 - RESILIENT BASE

1. Work Included: Work includes the following:

   a. Rubber base.

2. Rubber Base: Smooth-surface, toeless carpet type at carpeted floors and set-on cove type at other floor conditions, as indicated, 0.125 in. thick, 4 in. high, with rounded tops. Include preformed internal and external corners. Base of toe of cove type base shall conform to floor variations of 1/8 in.

3. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.

   a. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

      1) Floor Adhesives: Not more than 60 g/L.

-END OF SECTION-

SECTION 097112

CEMENTITIOUS WOOD FIBER WALL PANELS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide cementitious wood fiber wall panels as indicated on Drawings and as specified.

PART 2 PRODUCTS

2.01 ACOUSTICAL PANEL SYSTEM

A. System: For purposes of establishing a standard of quality and not for the purposes of limiting competition, the basis of the specification is Tectum Standard Interior Wall Panels, as manufactured by Tectum, Inc., or equal, and as follows:

1. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
2. Thickness: 1 in.
3. Widths: 3 standard widths; to be field cut and beveled where other than standard widths apply (corners). Match patterns indicated on Drawings.
4. Lengths: Varies, as indicated on Drawings.
5. Edge Condition: Beveled design, square ends.
6. Color: Factory painted white.

B. Mounting Style: ‘A’; provide all fasteners.

END OF SECTION

Section 09 72 33
DRY-ERASE WALL COVERING

## PART 1 – GENERAL

1.1 SUMMARY

A. The work of this Section consists of dry-erase wall coverings where shown on the Drawings, as specified herein, and as required for a complete and proper installation. Work includes, but is not limited to the following scope.

B. Furnish and install the following:
   1. Dry-erase surface.
   2. Accessories.

## PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:
   1. Koroseal Interior Products, Fairlawn, OH.
   2. OptiMA, Inc., Shrewsbury, MA.
   3. Smarter Surfaces, Dublin, Ireland.

2.2 MAGNETIC/PROJECTABLE DRY ERASE WRITING SURFACE

A. Basis of Design: Basis of Design: To establish a standard of quality, design and function desired, Drawings and specifications have been based on Koroseal Interior Products, Fairlawn, OH, “Walltalkers” series, product: “Projectable Mag-rite”, model “M2PR,” of sizes indicated on Drawings.
   1. Description: Dry erase writing surface, having scrim backing, impregnated with ferrous powder, pigmented vinyl capped with dry erase film.
   2. Characteristics:
      a. Conforming to ASTM E-84, Class A Flammability Testing.
      b. Roll width: 47/48 inches (1.19/1.22m) width.
      c. Fabric: Woven Polyester
      d. Laminate thickness: 24 mils.
      e. Tensile strength, (warp x fill): 80 by 80 pounds.
      f. Surface: Matte finish.
      g. Colors: As selected by the Architect from manufacturer’s full range of options.

2.3 ACCESSORIES

A. Trim and marker tray:
   1. Cap Wallcovering Trim: Clear satin, anodized aluminum, low profile trim.
   2. J-Trim: 1/4 inch extruded aluminum, clear anodized.
   3. Marker Tray: Clear anodized aluminum marker tray, continuous along full width of dry erase wallcovering.

**PART 3 - EXECUTION**

3.2 INSTALLATION

A. Comply with manufacturer's printed installation instructions.

B. For seamed applications, using a seam and strip cutter remove the factory edge of one sheet. Using the same tool, overlap and trace cut the mating edge of the second sheet. Repeat this step for as many sheets as required for the job.

C. Scribe, cut, and fit material to butt tightly to adjacent surfaces, built-in casework, and permanent fixtures and pipes.

End of Section

## SECTION 097625 - FIBERGLASS-REINFORCED PLASTIC PANELS (FRP)

1. Scope of Work: Provide FRP wall panels as indicated on Drawings and as specified.

2. Panels: Provide FRP panels as manufactured by The Kemlite Company; or approved equal.

   a. Nominal Thickness: Not less than 0.12 inch (3.0 mm).
   b. Surface Finish: Smooth.
   c. Panel Color: As selected by Architect.

3. Trim Accessories: Manufacturer's standard two-piece, snap-on vinyl extrusions designed to cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.

   a. Color: Match panels.

4. Adhesive: As recommended by plastic paneling manufacturer.

   a. Adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

5. Sealant: Single-component, mildew-resistant, acid-curing silicone sealant recommended by plastic paneling manufacturer.

   a. Sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

END OF SECTION

SECTION 097713

FABRIC-WRAPPED TACKABLE PANELS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Work of this Section consists of furnishing all labor, materials, equipment, and services necessary to furnish and install acoustical metal wall panels as indicated, as follows:

1. Fabric wrapped tackable panels, Type 1 and Type 2.

PART 2 PRODUCTS

2.01 TYPE 1 FABRIC-WRAPPED TACKABLE PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide The H.I.R. #1 Tackable Panels, as manufactured by Decoustics Limited; or comparable product by one of the following, or equal:

1. Armstrong World Industries.
2. Decoustics Limited; a CertainTeed Ceilings company.
3. Kinetics Noise Control, Inc.

B. Requirements of Regulatory Agencies: Acoustical wall panels shall comply with the fire-resistant requirements for interior finish and shall be classified as Class I material.

1. Maximum flame spread: 0-25
2. Testing: ASTM E 84

C. Noise Reduction:

1. NRC: For 1-1/8 in. panel NRC shall be 0.90 minimum.

D. Fabric-Wrapped Wall Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.

1. Mounting: Back mounted with manufacturer’s standard adhesive.
2. Core: Manufacturer's standard glass-fiber board.
3. Core-Face Layer: Manufacturer's standard tackable, impact-resistant, high-density board.
4. Edge Construction: Manufacturer's standard resin hardened core.
5. Edge Profile: Square.
6. Facing Material: Fabric from same dye lot; color and pattern as selected by Architect from manufacturer's full range].
7. Nominal Overall Panel Thickness: 1-1/8 inches.
8. Panel Width: As indicated on Drawings.

9. Panel Height: As indicated on Drawings.

2.02 TYPE 2 FABRIC-WRAPPED TACKABLE PANELS

A. Acceptable Manufacturer: Homasote Company, P.O. Box 7240, West Trenton, NJ 08628-0240; ASD. Tel: (609) 883-3300, Fax: (609) 530-1584, Internet address: http://www.homasote.com; or equal.

B. Provide Class A Panels: Homasote DesignWall(tm) Interior Panels, or equal.

1. Substrate: NCFR(R) fiberboard manufactured from 100 percent recycled wood fiber material; physical properties as follows:

   a. Thickness: 1/2 inch (13 mm).
   b. Density: 34-40 pcf (545-640 kg/cubic m).
   c. Water Absorption by volume (2 hour immersion): 5 percent maximum.
   d. Expansion, 50 to 90 percent relative humidity: 0.30 percent.
   e. NRC: 0.20.
   f. Flame Spread: 25, per ASTM E 84.
   g. Smoke Developed: 20, per ASTM E 84.
   h. Fuel Contributed: 10.
   i. Classification: Class A, per NFPA.

2. Fabric: FR 701(R), as manufactured by Guilford of Maine or equal, physical properties as follows:

   a. Content: 100 percent polyester.
   b. Weight: 16.0 +/- 0.5 oz./lin. yard (50 kg +/-16 g/m).
   c. Colorfastness to Light: No less than Grade 4 after 40 hours, per AATCC 16, Option A.
   d. ASTM E 84: Class A.
   e. NFPA-701: Passes.
   f. UL Test No. 214: Passes.
   g. FAA (PARA.25.853B): Passes.
   h. Boston Fire Code BFD IX-1: Passes.
   i. State of Massachusetts 527 CMR 21.00: Passes.
   j. Color: As selected by Architect from manufacturer's standard range.

3. Fabrication: Wrap fabric around long edges of panel to back side and laminate to substrate.

END OF SECTION

**SECTION 099100 - PAINTING**

1. Work Included: The scope of work consists of all painting work shown on the Drawings, described in the Specifications, or as reasonably inferred from either, in the opinion of the Architect, as being required, and includes:

   a. Surface preparation and field painting of the following:

      1) Exposed exterior items and surfaces;
      2). Exposed interior items and surfaces;
      3) Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surfaces treatments specified in other sections.

   b. Paint exposed surfaces whether or not colors are designated in "schedules", except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint same as similar adjacent materials or surfaces. If color or finish is not selected, the Designer will select colors or finishes from manufacturer's available choices.

      1) Painting work of this Section includes field painting exposed bare and covered pipes and conduits (including color coding), hangers, exposed steel and iron work, and metal surfaces of athletic, mechanical, and electrical equipment.

2. Latex and Alkyd Based Paints: Provide products of one of the following manufacturers that meet or exceed specified requirements, or approved equal:

   a. Benjamin Moore and Co. (Moore).
   b. Pratt & Lambert. (P & L).
   c. The Sherwin Williams Company (S-W)

3. High Performance Paint Coatings: Provide products of one of the following manufacturers that meet or exceed specified requirements, or approved equal:

   a. Tnemec Corporation (Tnemec).
   b. International Protective Coatings (IPC).
   c. Ameron Corporation (Ameron).

4. Interior Gypsum Wallboard for Eggshell, or Satin Finish:

   | | |
   |---|---|
   | One Coat | 1. Benjamin Moore; Eco-Spec Interior Latex Primer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).<br>2. Duron Equal<br>3. S-W Equal |
   | Two Coats | 1. Benjamin Moore; Eco-Spec Latex Eggshell Enamel: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).<br>2. Duron Equal<br>3. S-W Equal |

5. Interior Gypsum Wallboard Ceilings for Flat Finish:

| | |
|---|---|
| One Coat | 1. Benjamin Moore; Eco-Spec Interior Latex Primer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).<br>2. Duron Equal<br>3. S-W Equal |
| Two Coats | 1. Benjamin Moore; Eco-Spec Latex Flat: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).<br>2. Duron Equal<br>3. S-W Equal |

6. Interior Finish Carpentry, for Satin-Gloss Paint Finish (softwoods, paint grade hardwoods, MDO, and hardwood veneers):

| | |
|---|---|
| One Coat | 1. Benjamin Moore; Eco-Spec Interior Latex Primer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).<br>2. Duron Equal<br>3. S-W Equal |
| Two Coats | 1. Benjamin Moore; Eco-Spec Latex Eggshell Enamel: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).<br>2. Duron Equal<br>3. S-W Equal |

7. Interior Finish Carpentry for Satin Transparent Finish (all hardwoods and hardwood veneers, except paint grade and factory-finished items):

| | |
|---|---|
| Sand | 120 grit sandpaper. |
| Sand | 220 grit sandpaper. |
| Stain | 1. Moore Interior Wood Finishes Penetrating Stain<br>2. Devoe Equal<br>3. S-W Equal |
| Two Coats | 1. Moore Benwood Polyurethane Finish<br>2. Devoe Equal<br>3. S-W Equal |

8. Interior Metals not Specified to Receive other Coating Systems:

| | |
|---|---|
| One Coat | 1. Approved primer, in shop under other Sections (where specified) |
| One Coat | Field Primer (only where shop primer is not specified):<br>1. S-W Universal metal primer. |
| Two Coats | 1. S-W Acrylic Enamel. |

9. Interior Mechanical and Electrical Work (Paint all exposed items throughout the interior project except factory finished items with factory-applied baked enamel finishes which occur in mechanical rooms, and excepting chrome or nickel plating, stainless steel, and aluminum

other than mill finished. Paint all exposed ductwork and inner portion of all ductwork visible through grilles and registers):

Same as specified for other interior metals, hereinabove.

10. Exterior Galvanized Steel for Acrylic Polyurethane Finish (exterior handrail and railing assemblies, steel bollards):

| | | |
|---|---|---|
| One Coat | 1. | Epoxy Primer in fabricator's shop, under other Sections. |
| Finish Coat | 1. | Urethane top coats in fabricator's shop, under other Sections. |

11. Exterior Galvanized Steel Doors and Frames for Acrylic Polyurethane Finish:

| | | |
|---|---|---|
| One Shop Coat | 1. | Shop Primer in fabricator's shop, under Section 081100. |
| After Installation: | | |
| Barrier Coat: | 1. | As recommended by manufacturer for compatibility between shop coats and field coats. |
| First Field Coat | 1.<br>2.<br>3. | Tnemec "No. N69 Hi-Build Epoxoline" Epoxy<br>IPC Equal<br>Valspar Equal |
| Second Field Coat (dry film 1.5 to 2.0 mils) | 1.<br>2.<br>3. | Tnemec "No. 1081 Endura-Shield III"<br>IPC Equal<br>Valspar Equal |

12. Exterior Finish for Wood Siding, Trim, and Trellis Work:

| | | |
|---|---|---|
| Two Coats | 1. | Benjamin Moore Exterior Finish Deck and Siding Translucent Alkyd (#326). |

13. Interior Steel Doors and Frames for Acrylic Polyurethane Finish:

| | | |
|---|---|---|
| One Shop Coat | 1. | Shop Primer in fabricator's shop, under Section 081100. |
| After Installation: | | |
| Barrier Coat: | 1. | As recommended by manufacturer for compatibility between shop coats and field coats. |
| First Field Coat | 1.<br>2.<br>3. | Tnemec "No. N69 Hi-Build Epoxoline" Epoxy<br>IPC Equal<br>Valspar Equal |

| | |
|---|---|
| Second Field Coat (dry film 1.5 to 2.0 mils) | 1. Tnemec "No. 1081 Endura-Shield III"<br>2. IPC Equal<br>3. Valspar Equal |

END OF SECTION

# SECTION 101400 - SIGNAGE

## 1.1 SUMMARY

A. Section Includes:

1. Provide wall and door plaques as scheduled.
2. Provide cut-out metal letters.
3. Provide occupancy signs in spaces required by code or local ordinance.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Melamine Plastic: Material shall be “self-extinguishing” and furnished with a “life-of-building” warranty. Material shall be as manufactured by Westinghouse, Wilson, General Electric, or approved equal in thickness required for intended use.

B. Bronze Plate: ASTM B 36/B 36M, Alloy UNS No. C22000 (commercial bronze).

C. Paint: Water based aliphatic polyurethane, as manufactured by Tnemec, IPC, or PPG.

D. Vinyl Die-Cut Letters and Film: Opaque, non-reflective vinyl film. 0.0035 in. minimum thickness, with pressure sensitive adhesive backing, suitable for exterior use as well as interior applications.

E. Aluminum: Provide aluminum sheet and tubing of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.

## 2.2 DIMENSIONAL CHARACTERS

A. Cutout Characters: Characters with uniform faces; square-cut, smooth, eased edges; precisely formed lines and profiles; and as follows:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:

a. APCO Graphics, Inc.
b. ASI Sign Systems, Inc.
c. Gemini Incorporated.
d. Matthews International Corporation; Bronze Division.
e. Metal Arts; Division of L & H Mfg. Co.
f. Nelson-Harkins Industries.
g. Southwell Company (The).

2. Character Material: Sheet or plate bronze.
3. Character Height: As indicated.
4. Thickness: 0.25 inch.
5. Finishes:

    a. Integral Metal Finish: As selected by Architect from full range of industry finishes.

6. Mounting: Projecting studs.
7. Typeface: As indicated.

2.3 INTERIOR ROOM SIGNS

A. Provide raised tactile ADA complying signage meeting the following:

1. Solid-Sheet Sign: Bronze sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph below and as follows:

    a. Thickness: 0.125 inch (3.18 mm).
    b. Etched and Filled Graphics: Sign face etched or routed to receive enamel-paint infill.
2. Surface Finish and Applied Graphics:

    a. Integral Metal Finish: As selected by Architect from full range of industry finishes.

3. Mounting: Surface mounted to wall with concealed anchors or fasteners.

2.4 OCCUPANCY SIGNS

A. Frame for occupancy certificate, maximum occupancy and Building signs shall be bronze, satin finish, with one side of frame removable.

B. For size of frame see Drawings, minimum ½ in. face width.

C. Provide ¼ in. plywood backing in the frames.

D. Secure frames to walls using tamperproof devices suitable for intended substrate.

E. Text shall be white lettering on a bronze background and shall be

as follows: “Maximum Occupancy” (3 in. high, ¾ in. stroke)

“Not to Exceed” (2 in. high, ½ in.

stroke) “XXX Persons” (3 in. high,

¾ in. stroke)

END OF SECTION

## SECTION 102113 - PLASTIC LAMINATE TOILET COMPARTMENTS

1. Work Included: The work of this Section consists of providing plastic laminate toilet compartments including related accessories, hardware, and related items, including, but not limited to:

    a. Plastic laminate toilet partitions and urinal screens, completely erected.
    b. Related mounting brackets, fastening devices, and anchors.
    c. Related finish hardware and accessories, as specified.

2. Manufacturer: Provide products of the following that meets or exceeds specified requirements:

    a. Model: Classic Series.

3. Partitions, Stiles, Screens, and Doors:

    a. Plastic Laminate: Shall be high pressure laminated plastic, NEMA LDS-19 minimum thickness 0.0625 in., color as selected by Architect from complete range of standard and standard special colors offered by manufacturer. No limit is placed on the number of colors to be used, and will vary from floor to floor.

    b. Core:

        1) Stiles: three ply resin impregnated particle board bonded to each side of an 11 gauge steel reinforcing core.
        2) Panels, doors, and wall post: three ply resin impregnated particle board, Type II, Grade DB, 45 lb. density.

4. Adhesives: Shall be type which will prevent delamination from heat and moisture in public washrooms.

5. Hardware and Fittings:

    a. Metal: Stainless steel, Type 304.
    b. Finish: Stainless steel: No. 4 Satin finish.

6. Leveling Device: Shall be 3/8 in. by 1 in. steel bar.

7. Fasteners:

    a. Hinge and Latch: Shall be factory installed threaded steel inserts and stainless steel one-way machine screws; latch track factory installed thread T-nuts.
    b. Door Hardware: Shall be stainless steel one-way sheet metal screws.

c. Mounting Brackets: Shall be stainless steel phillips head sheet metal screws.
d. Leveling Device: Shall be 3/8 in. threaded rod, nuts, and sleeve anchor.

8. Stile Shoes: Shall be one piece, 4 in. high, Type 304, stainless steel with No. 4 Satin finish.

9. Configuration:

a. Toilet partitions shall be floor supported, overhead braced.
b. Screens shall be wall hung.

10. Stiles, Partitions, Screens, and Doors:

a. Bonded high pressure plastic laminated to core material with adhesive specially formulated to prevent delamination in moist, warm areas of public washrooms. Bond edges prior to bonding face sheets. Make no splices or joints in faces or edges.
b. Install threaded steel inserts for mounting hinge and latch.
c. Pre-drill screw holes for coat hook and keeper.
d. Finish thickness - 1 in. for uniform flush front.

11. Anchoring and Leveling Devices: Continuously weld anchoring and leveling device to steel reinforcing core of stile.

12. Door Hardware:

a. Hinge: Shall be self-lubricating balanced hinge adjustable hold open feature.
b. Latch: Shall be combination slide latch and bumper equipped for emergency access, without use of tools.
c. No hardware for brackets will be permitted on the outside of compartment except on compartments with outswinging doors.

13. Accessories:

a. One combination coat hook and bumper shall be installed on each toilet enclosure door, and shall be manufacturer's standard, subject to Architect's approval.

-END OF SECTION-

## SECTION 102800 - TOILET ACCESSORIES

1. Work Included: Furnish and install all toilet accessories as required to complete the work of the Contract.

2. Manufacturers: Accessories shall be manufactured by Bobrick Washroom Equipment Company; American Specialties, Inc.; Bradley Corporation Washroom Specialties Division; or approved equal.

3. Toilet Accessories:

   a. Lavatory mirror: Bobrick B-290 1830
   b. Soap dispenser: Bobrick B-2111
   c. Towel dispenser/waste receptacle: Bobrick B-36903
   d. Toilet paper dispenser: Bobrick B-2888
   e. Sanitary napkin/tampon disposal: Bobrick B-254
   f. Grab bars (HC toilet): Bobrick B-5806.99 x 42, 2 per stall

-END OF SECTION-

## SECTION 104400 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

1. Work Included: Furnish and install fire extinguishers, cabinets, and accessories as required to complete the work of the Contract. Include, but do not limit to:

   a. Fire extinguishers.
   b. Fire extinguisher cabinets.
   c. Mounting brackets.

2. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

3. Fire Extinguisher Cabinets and Accessories: Subject to compliance with requirements, provide products of one of the following manufacturers; Catalog designations of Larsen's Manufacturing Company cabinets are specified herein to establish standard of quality.

   a. Larsen's Manufacturing Company, Minneapolis, MN 55432.
   b. J. L. Industries.
   c. Muckle Manufacturing, Division of Technico, Inc.
   d. Profile International, Inc.

4. Fire Extinguishers: General Fire Extinguisher Co., Multi-Purpose Dry Chemical Type (4A-60BC-FE): UL-rated 4-A:60-B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B, and Class C fires; No substitutions will be permitted.

5. Fire Extinguisher Cabinet, Fully Recessed Type at all Public Spaces: Larsen Model #2409, with the following features:

   a. Break glass door.
   b. Red fire handle.
   c. Bronze finish.
   d. Rough Opening: 24-1/2 in. x 10-1/2 in. x 6-1/4 in.

6. Fire Extinguisher Cabinet, Semi-Recessed: Larsen Architectural Series Model #2409-R2 for fully-recessed cabinets; and Model 2409-6R for semi-recessed cabinets, with vertical duo door style, with the following features:

   a. Tempered glass in door.
   b. Red fire handle.
   c. Bronze finish.
   d. Tub, 6 in. id.
   e. 2 hr. fire rated where installed in rated walls.

7. Cabinet Construction: Manufacturer's standard enameled steel box as required, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

8. Wall Brackets: Where cabinet is not required, provide extinguisher manufacturer's recommended standard wall mounting bracket, sized to fit extinguisher.

-END OF SECTION-

## SECTION 106520 - OPERABLE PANEL PARTITIONS

1. Work Included: Provide manually operated, individual folding panel partition assemblies.

2. Sound Transmission Classification (STC): Provide units which have STC rating of at least 51 (NSSEA Class G) when tested according to ASTM E 90.

3. Manufacturers: Provide products of one of the following manufacturers if they meet or exceed the requirements of these specifications:

    a. Advanced Equipment.
    b. Hufcor, Inc.
    c. Modernfold Division of American Standard Co.

4. Operations: Single panel operation of individual panels, manually operated, flat steel panels, top supported with individual crank or level operated seals.

5. Panel Construction: All steel construction, nominal 4 in. thick in manufacturers standard panel widths, with trimless vertical joints.

6. Suspension Systems and Tracks:

    a. For Panels:

        1) Overhead track and suspension system (aluminum or steel). If aluminum with steel running surfaces.
        2) Trolleys shall be all steel; with four (4) formed ball bearing, all steel wheels.

7. Sound Seals: Airtight closure around the perimeter of each panel with retractable floor seals.

8. Accessories:

    a. Pass Doors with hardware and exit sign, if required.
    b. Pocket Doors of same construction as panel.

9. Finish Surface:

    a. Apply porcelain-enamel steel “white-board” writing surface, on both sides of panels.

END OF SECTION

## SECTION 111320 - PROJECTION SCREENS

1. Work Included: Work of this Section includes, but is not limited to:

   a. Electrically operated projection screens.

2. Manufacturers: Provide products from one of the following manufacturers, or Architect approved equal:

   a. Bretford Manufacturing Co., Schiller Park, IL 60176
   b. Da-Lite Screen Co., Inc., Warsaw IN 46580
   c. Draper Shade and Screen Co., Inc., Spiceland, IN 47385-0425

3. Manufacturer and Type: Provide "BoardRoom" Electrically Operated Projection Screen, manufactured by Da-Lite Screen Company, Inc., or approved equal from another specified manufacturer.

4. Description: Provide projection screen with glass beaded surface on flame and mildew resistant fabric, with 2 in. black masking borders. Provide screen electrically operated, ceiling recessed, and mounted on a roller of rigid metal, minimum 3 in. diameter, mounted on vibration and sound absorbing supports in a wood case with a metal-lined wiring compartment, complete with metal bracket hangers. Electrical operation shall be three wire, quick reverse type with accessible pre-set limit switches to stop screen automatically in up and down positions, with motor within roller. Motor shall be suitable for 115 volt, 60 Hz electric current. Unit shall be UL-listed.

5. Include remote three-position control switch to be installed and wired by electrical trade.

-END OF SECTION-

## SECTION 116653 - GYMNASIUM EQUIPMENT

1. Scope: Furnish and install the athletic equipment work, as indicated on the Drawings and as specified herein. Include but not be limited to:

   a. Basketball backstops, backboards and goals.
   b. Sleeves and floor plates for badminton and volleyball uprights.
   c. Protective wall padding

2. Folding Basketball Backstops: Provide as required forward folding backstop assemblies. Folding backstop assemblies shall be overhead structure supported with supplemental framing and shall include tempered glass backboards and collapsible goals, as manufactured by Porter Athletic Equipment Company (Porter), or approved equal as manufactured by Proline Athletic, or Performance Sports Systems; or approved equal. Porter catalog designations are specified to establish standard of quality for performance and materials. All backstop assemblies shall be suitable for basketball competition play in accordance with the requirements of NCAA Basketball. All backstop framing and supplemental framing shall be painted flat (matte) white. Provide capacity in backstop and supplemental framing to support shot clocks where such are indicated to be backstop mounted.

   a. Forward Folding Backstops: Provide where indicated Porter Model 950 series Center-Strut Ceiling Suspended, Forward-Fold, Front Braced, Bent Mast Backstop.

   b. Provide each backstop with backboard. Backboard shall be Porter Model 00208-000 rectangular tempered glass backboard with aluminum faced tubular steel frame. Backboard shall be 72 inch wide by 42 inch high with fused target and boarder markings. Marking color shall be white.

   c. Provide each backboard with Porter Model 00326-000 Bolt-On Backboard Safety Padding. Color shall be manufacturer’s standard medium gray.

   d. Provide goal with net at each backstop. Goal shall be Porter Model 00250-500 Torq-Flex at each backstop. Provide each goal properly mounted to transfer goal loads directly to backstop without loading backboard.

   e. Provide each backstop with electrically operated winch. Winch shall be Porter Model 00706-000 1/2 horsepower or model 00707-000 3/4 horsepower as required by backstop and applied loads. Winch shall be prewired with 54 inch long rubber covered cable with polarized plug attached. Provide keyed switch with cover plate for each winch. Keyed switch shall be located within room as directed by Designer unless indicated otherwise.

   f. Provide each backstop with safety lock. Safety lock shall be Porter Model 10797-100 Saf-Strap basketball safety lock.

   g. Conduit, outlet receptacles, connectors, and wiring shall be provided as a part of the work of Division 26, ELECTRICAL.

3. Control Center: Provide one (1) Porter Model 2500 Control Center for each Gymnasium.

4. Badminton Floor Plates and Sleeves: Provide cast brass nominal 0.20 in. thick flush-mount floor plate with hinged door, suitable for use of badminton uprights, with pre-drilled holes for anchors. Plates shall be Type KA 25 S manufactured by Senoh and distributed by Sports Imports Incorporated, Columbus, OH 43221, or approved equal.

   a. Sleeves shall be 3 in. internal diameter steel barrel with 0.14 in. thick walls and top screw-down flange. Sleeve shall be approximately 9 in. Base of sleeve barrel shall be flanged for setting into asphaltic concrete slab.

5. Volleyball Floor Plates and Sleeves: Provide volleyball floor plate and sleeve Schelde model 62107 sleeve and Model 62126 Oversized Floor Plate. Cover to be solid brass with hinged access cover, set flush in wood floor. Floor plate to be 7-7/16 inch outside diameter. Sleeve to have pre-drilled flanges for fastening of cover plate. Sleeve shall be 12-3/8 in. long. Inside diameter of the sleeve shall be 4 in.

6. Corner and Wall Padding: Provide as follows:

   a. Wall protection mats shall be polyester reinforced solid vinyl, 14 oz. minimum, with 2 in., thick urethane foam padding. Mats shall have fire retardant covering. Sizes shall be as indicated on the Drawings.
   b. Wall Pad: Porter No. 00355-600, 6' - 0" wall pad with Velcro attachment strips, manufactured by Porter Athletic Equipment Co., or approved equal.
   c. Column Pad: Porter No. 00356-600, 6' - 0" column pads with Velcro attachment strips, manufactured by Porter Athletic Equipment Co., or approved equal.
   d. Wrap Around Column Pad: Porter No. 97060-000, wrap around column mat, manufactured by Porter Athletic Equipment Co., or approved equal.
   e. Color of matting and padding shall be selected by Architect from manufacturer's standard colors.

7. Tennis Net System: Provide floor mounted tennis net systems Porter Athletic Equipment Corporation model 02991-042 (net), 00947-00 (posts/standards), and 00875-200 (floor sleeves) or equal.

8. Batting Cage: Provide ceiling suspended, retractable batting cage, Porter Athletic Equipment model 90920. Batting cages shall be electrically operated from basketball goal control location.

END OF SECTION

## SECTION 124813 - ENTRANCE MATS AND FRAMES

1. Work Included: The work of this Section includes, but is not limited to:

   a. Entrance mats

2. Basis-Of-Design Products: Provide Grate Mat XT foot grille by Mats Inc., PO Box 839, 37 Shuman Avenue, Stoughton, MA, 02072; telephone 800-628-7462 or 781-344-1536; fax 781-344-1537; www.matsinc.com.

3. Exposed hinge rail connectors shall be vinyl hinge only complete with perforations for drainage. Tread rails shall be manufactured from aluminum, complete with co-extruded soft-durometer cushions, supplied in mill finish.

4. Tread Insert Options: Carpet shall meet the Carpet and Rug Institute's standard for indoor air quality. Fibers shall include a minimum of 100, 12 mil monofilament fibers per square inch and colorfast, solution dyed nylon. Available in one of 11 standard colors as offered by manufacturer. Each carpet fiber and monofilament shall be fusion-bonded to a rigid two-ply backing to prevent fraying and supplied in continuous splice-free lengths. Carpet weight shall be 33 oz./sq. yd.

5. Framing for Aluminum Foot Grille: Aluminum frame shall be a 1 in. deep recessed frame in 6063-T5 aliuminum alloy with 1/8 in. wide exposed surface. Frame color shall be mill finish.

-END OF SECTION-

## SECTION 125220 - ROLLER SHADES

1. Description of Work: Work of this Section includes, but is not limited to:

   a. Electrically operated window shades
   b. Manually operated window shades

2. Electrically Operated Window Shades: Provide Mecho Electri-Shades, as manufactured by Mecho Shade Systems, Inc., or approved equal as manufactured by Nysan. Provide shade fabrics and features as follows:

   a. Shade Cloth: Provide "EcoVeil" non-PVC shade cloth, color shall be as indicated on Drawings.

3. Manually Operated Shades: Provide Mecho Shades SlimShades, as manufactured by Mecho Shade Systems, Inc., or approved equal as manufactured by Nysan. Provide shade fabrics and features as follows:

   a. Shade Cloth: Provide "EcoVeil" non-PVC shade cloth, color shall be as indicated on Drawings.

END OF SECTION

Section 126100
FIXED AUDIENCE SEATING

## PART 1 - GENERAL

1.1 SUMMARY

A. The work of this Section consists of furnishing and installing fixed audience seating where shown on the Drawings, as specified herein, for a complete and proper installation.

## PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design (Specified Manufacturer): To establish a standard of quality, design and function desired, Drawings and specifications have been based on KI Furniture and Seating (KI):
   1. Seating Style: KI “Lancaster” Series.
   2. Wood species: KI “Standard Wood” series, color “Kensington Maple on Maple”.
   3. Laminate: KI “Seating Laminates” series, color: “Kensington Maple”.

B. Acceptable manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:
   1. KI Furniture and Seating, Green Bay, WI.
   2. Sedia Systems, Chicago IL.
   3. American Seating, Grand Rapids, MI.

2.2 MATERIALS - GENERAL

A. Steel standards and back wings: All steel shall have smooth surfaces and be of sufficient gauge thickness and designed to withstand strains of normal use and abuse.

B. Padding material: Seat and back padding material shall be of new (prime manufacture) polyurethane foam. Padding material shall comply with the flammability requirements outlined in California Technical Information Bulletin No. 117, Resilient Cellular Materials, Section A and D, dated February 1975, when tested in accordance with Federal Test Method Standard 191, Method 5903.2.
   1. Padding shall be securely adhered to plywood inner shell.
   2. Thickness: 2 inches.

C. Wood: Plywood, exposed or concealed, hardwood, made with adhesive containing no added urea formaldehyede (NAUF).

D. Upholstery Fabric: Fabric shall meet class 1 flammability requirements of US

Department of Commerce Commercial Standard 191 per California Technical Bulletin No. 117.

1. Treat fabric for fire retardance to comply with Massachusetts Fire Code Regulation FPR 20 and California Technical Fire Safety Bulletin 117 Section E, NFPA 701 and as additionally required by City of Boston Fire Marshall.
2. Fabric color and pattern shall as selected by Architect, acceptable manufacturers include the following or approved equal.
   a. KI Furniture and Seating, Green Bay, WI.
   b. CF Stinson, Rochester Hills, MI.
   c. Mayer Fabrics (Mayer-Paetz Inc.), Indianapolis, IN.

E. Injection molded plastic: one-piece high-impact, linear polyethylene with built-in ultraviolet light inhibitors to retard fading. Plastic shall have a burn rate of 1 inch per minute when tested in accordance with ASTM D635 or the Department of Transportation Motor Vehicle Safety Standard No. 302. Color shall be selected from manufacturer's standard color range.

## 2.3 SEATING

A. General: Floor attached type chairs, 19 to 23 inch widths, consisting of an attached inner upholstered back and hinged fully upholstered seat which automatically returns to an upright three-quarter fold position.

1. Not more than 15 percent of all seating may be 19-inch width. No 19-inch width seats shall be placed adjacent to another 19-inch width seat. 19-inch

   width seats shall be randomly distributed throughout the auditorium and lecture halls in the widest possible dispersion pattern.
2. Provide armless seats in compliance with accessibility requirements, where indicated on the Drawings.
3. Provide transfer seats in compliance with accessibility requirements.
4. Provide accessible locations as indicated.

B. Standards: Floor mounted formed steel.

1. Standards: The standards shall be pedestal design made by a rectangular tube, nominally 1 by 3 inches, with heavy gauge steel. A reinforced bracket for seat pan attachment shall be integrated into the standard which has an inlay at midpoint for resistance upon force.
2. Aisle Standards-Rectangular-3/4 size design: The aisle standards shall be fabricated in the same manner as the center standards with a formed panel of 16 gauge steel welded to the column to accept a decorator panel:
   a. Rectangular shaped end standard shall be painted with epoxy powder finish.

C. Chair backs: Manufacturer’s optional wood back panel with 3/8 inch thick veneer core and 1/16 inch thick maple veneer face, attached to 7/16 inch thick molded plywood inner structure bonded with 2 inches of 1.8 pcf density urethane foam.

D. Seat assembly: Self-lifting seat, padded and upholstered with one-piece injection molded outer panel and hardwood inner upholstery panel.

1. Counter Balance: The seat pan shall rotate on two solid steel rods with lifetime lubricated nylon shoulder bushings. The rear area of the pan shall be weighted to create a counterbalance that allows the seat to return to 90 degree vertical position by means of gravity.
2. Provide seat numbers and locate them on the front edge of the seat pan.

E. Armrests: Solid wood, 3/4 inch thick by 2-1/4 inches wide and 12 inches long, steamed, kiln dried, with translucent finish.
1. Finish:
a. Stain: Color as selected by the Architect.
b. Finish coats: 2 coats factory applied polyurethane.
2. ADA swing-up armrests to hinge with cantilevered end standards to allow equal access for disabled patrons. Accessible chairs shall include the universal handicapped symbol on the cantilevered end aisle standard for clear identification.
a. Provide not less than eight seats or 1 percent of total seating whichever is greater with ADA transfer armrests.
b. Provide at each ADA companion seat:
1) Manufacturer's signage for companion seating adjacent to all seats with ADA transfer armrests at locations as indicated on the Drawings and in compliance with all applicable laws, regulations, and codes.

F. Aisle Lights (locate as indicated on approved shop drawings): UL listed, pre-wired and finished complete with utility box, light socket, LED lamp and detachable lens plate, located under arms.
1. Provide 1 light per riser/step to be on side of seating areas coordinate with Division 26 – Electrical.

G. Number and letter plates: 5/8 by 1-5/8 inch brushed aluminum finished plates with Helvetica Medium letter and numerals.
1. Attach plates with escutcheon pins with matching finish.

2.4 FINISHES

A. All exposed metal, including bolted connections shall have a baked enamel finish in color selected by Architect.

**PART 3 - EXECUTION**

3.2 INSTALLATION

A. Install chairs in locations indicted on reviewed and accepted shop drawings in accordance with manufacturers written instructions.
1. Check all dimensions against shop drawings and make necessary adjustments for discrepancies in layout.

End of Section

## SECTION 126600 - TELESCOPING BLEACHERS

1. Work Included: Provide all labor, materials, equipment, and services necessary to complete the work indicated, and without limiting the generality thereof includes:

   a. Retractable bleacher seating – wall attached, motorized telescoping wood bleachers (w/ plastic seats) with all associated hardware and railings.

2. Product: Provide Hussey Maxam Series Telescopic Gym Seat System or approved equal and as follows:

   1. Manufacturer: Hussey Seating Company, U.S.A.
      Address: North Berwick, Maine, 03906
      Telephone: (207) 676-2271; Fax: (207) 676-9690

   2. Model: MXM26 Series Telescopic Gym Seats, adjustable row spacing in two inch increments from 22 inches [559] to 26 inches [660].

      1) Aisle Type: foot level aisles, intermediate aisle steps.
      2) Seat Type: MVP (plastic seat module).
      3) Seat color finish: manufacturers 15 standard.
      4) Rail Type: Self-storing rail, aisle hand rails
      5) Operation: electrical power
      6) Electrical Power System: Integral power with pendant control.

   3. Product Description/Criteria:

      1) Bank Length: (2) banks @ 96’-6” long
      2) Aisle Widths: 4’6 wide
      3) Number of Tiers: 10 tiers
      4) Row Spacing(s): 26”
      5) Row Rise: 9 5/8”
      6) Open Dimension: 20’-7”
      7) Closed Dimension: 3’-7”
      8) Overall Unit Height: 7’-10”

   4. Miscellaneous Product Accessories: end panels, seat number’s, row letters.

   5. Handicap Seating Provisions: Provide first tier handicap cutouts per requirements of (ADA) Americans with Disability Act located as indicated.

   6. Special Seating Graphics: Provide contrasting or matching seat top or seat base colors to create graphic pattern as indicated.

3. Lumber: ANSI/Voluntary Product 20, B & B Southern Pine

4. Plywood: ANSI/Voluntary Product PS1, APA A-C Exterior Grade.

5. Structural Steel Shapes, Plates and Bars: ASTM A 36.

6. Uncoated Steel Strip (Non-Structural Components): ASTM A569, Commercial Quality, Hot-Rolled Strip.

7. Uncoated Steel Strip (Structural Components): ASTM A570 Grade 33, 40, 45, or 50, Structural Quality, Hot-Rolled Strip.

8. Uncoated Steel Strip (Structural Components): ASTM A607 Grade 45 or 50, High-Strength, Low Alloy, Hot-Rolled Strip.

9. Galvanized Steel Strip: ASTM A653 Grade 40, zinc coated by the hot-dip process, structural quality.

10. Structural Tubing: ASTM A500 Grade B, cold-formed.

11. Polyethylene Plastic: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation; in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

12. Fasteners: Vibration-proof, of size and material standard with manufacturer.

13. Frame System:

    a. Wheels: Not less than 5" diameter by 1-1/4" with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil impregnated bushings to fit 3/8" diameter axles secured with E-type snap rings.
    b. Lower Track: Continuous Positive Interglide System interlocks each adjacent CPI unit using an integral, continuous, anti-drift feature and through-bolted guide at front to prevent separation and misalignment. Each CPI unit shall contain a Low Profile Posi-Lock LX to lock each row in open position and allow unlocking automatically. Provide adjustable stops to allow field adjustment of row spacings.
    c. Slant Columns: High tensile steel, tubular shape.
    d. Sway Bracing: High tensile steel members through-bolted to columns.
    e. Upper Guide: High tensile steel through-bolted to nose and riser. Interlocks with adjacent upper tier to prevent separation and misalignment. Provide adjustable stops to allow field adjustment of row spacings.
    f. Deck Support: Securely captures decking for entire length of section.

14. Deck System:

    a. Section Lengths: Each bank shall contain sections not to exceed 25’-6” in length with a minimum of two supporting frames per row, each section.
    b. Nosing and Rear Riser: Continuous roll formed galvanized steel members.
    c. Attachment: Through-Bolted fore/aft to deck guides, and frame cantilevers.
    d. Decking: 5/8", AC grade, tongue & groove, transversely oriented plywood, interior type with exterior glue, 5-ply, all plies Southern Pine with plugged crossbands, produced in accordance with National Bureau of Standards PS-1-83. Longest unsupported span: MXM 26, 21-½”; MXM 33, 28 ½”.
    e. Deck End Overhang: Not to exceed frame support by more than 5'-7".

15. MVP Seat System:

    a. Seat Modules: 18" long unitized, interlocking, engineered, high density polyethylene modules providing scuff resistant textured 10" wide anatomically contoured seat surface. 1/2” minimum interlock on seat and face.

b. Profile: Designed with internal reinforcement ribs and cantilevered to the rear to provide not less than 3" smooth toe space beneath the seat.
c. Seat Support: Each seat support module shall be secured against fore/aft movement by not less than (2) two longitudinally sited steel fasteners spaced no less than 2 1/4" on center, creating a steel to steel connection, tying the structure firmly to the steel nosing.
d. Number Plates: Seat module shall be designed to accept seat number plates.
e. End Caps: Each end of row shall be enclosed with matching end caps. End caps shall be designed with concealed attachment and provide indent for row letters. Color to match seat top.

16. Integral Power: Furnish and install Hussey (PF 1, 2, 3, or4), an integral automatic electro-mechanical propulsion system, to open and close telescopic seating. Integral Power and Control System shall be Underwriters Laboratories, Inc. (UL) approved and listed.

a. Operation shall be with a removable pendant control unit which plugs into seating bank for operator management of stop, start, forward, and reverse control of the power operation.
b. Each Powered Frame unit shall consist of output shaft gear reducer with 6" diameter x 4" wide wheels covered with non-marring 1/2" thick composite rubber. Reducers shall be fitted with induction motors which will provide an average operating speed of (46/25) f.p.m.
c. Operating Loads: Each Powered Frame provides (220 / 550) lbs pull force which equals approximately (28 / 35) lbs psi lateral force on the floor.
d. Limit Switches: Furnish and install both open and closed limit switches for the integral power system. The limit switches will automatically stop integral power operation when seating has reached the fully extended or closed position.

17. Power operation shall utilize a combination of contactors and limit switches to insure the wiring is not energized except during operation. Straight wired electric system is not allowed.

a. Motion Monitor: Provide flashing light with self-contained warning horn rated at 85 db at 10’ mounted under telescopic seating for audio and visual warning during integral power operation.

b. Electrical: Seating Manufacturer shall provide all wiring within seating bank including pendant control.

1) Each unit is power operated by a 1/2 horsepower, 1725 R.P.M., 208 Volts, 50/60 Hz., three phase 1.25 service factor motor. This motor draws a full load current of 2.2 amperes. Power supply required shall be 120/208 volts three phase 4 wire plus ground service with 20 amps. Motors, housing, and wiring shall be installed and grounded in complete accord with the National Electric Code.
2) The electrical contractor shall provide required power source with no greater than 4% voltage drop at the seatings junction box. The electrical contractor shall perform all wiring connections in junction box that are attached to or a part of the building.

18. Flex-Row: Provide first ROW modular units to be utilized by persons in wheelchairs and able bodied persons. Each Flex-Row unit shall have an unlock lever for easy deployment if wheelchair access is needed. Unlock lever shall lock the bleacher seats into position when fully opened.

a. Provide a black full surround skirting 1/2” off the floor for safety and improved aesthetics.

b. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics.

c. Provide a mechanical positive lock when the Flex-Row system is in the open and used position.

d. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 - 7 seats wide as well as full section widths.

19. Provide a removable belt barrier with or without signage for the rear of each recoverable Flex-Row module to assist with seating identification.

20. Front Aisle Steps: Provide at each vertical aisle location front aisle step. Front steps shall engage with front row to prevent accidental separation or movement. Steps shall be fitted with four non-skid rubber feet each 1/2" in diameter. Blow molded end caps shall have full radius on all four edges. Quantity and location as indicated.

21. Non-Slip Tread: Provide at front edge of each aisle locations an adhesive-backed abrasive non-slip tread surface.

22. Foot Level Aisles: Provide deck level full width vertical aisles located as indicated.

23. Intermediate Aisle Steps: Intermediate aisle steps shall be of boxed fully enclosed type construction. Blow molded end caps shall have full radius on all four edges. Step shall have non-skid on surface. Quantity and location as indicated.

24. Intermediate Aisle Handrails: Provide single pedestal mount handrails 34” high with terminating mid rail. Handrails shall be attached to the socket and shall rotate 90° for easy storage in socket. Aisle handrails that are detached from the socket for storage are unacceptable.

25. End Panel: Provide closure end panels for stack position at each exposed bank ends. End panels shall be constructed of 5/8" Southern pine plywood or Polydeck.

26. Self Storing End Rails: Provide steel self-storing 42" high above seat, end rail with tubular supports and intermediate members designed with 4" sphere passage requirements.

27. Seat Numbers: Provide each plastic seat module with a 1-3/4" x 1 1/4" oval etched Lexan plate. Easy to read black numerals will be on the plate fitted in a vandal resistant recess

28. Row Letters: Provide at each row end of plastic seat a 1 3/4" x 1 1/4" oval etched Lexan plate with black numerals. Plates to be fitted flush in vandal resistant end cap recess.

29. Poly Deck: Shall be a high-density polyethylene overlay panel fabricated with a skid-resistant textured top surface of 100% moisture barrier bonded to a plywood substrate with an exterior glue. Panel thickness shall be 5/8” with top polyethylene surface colored weathered gray.

END OF SECTION

## SECTION 142400 - HYDRAULIC ELEVATORS

1. Work Included: Provide as follows:

   a. Hydraulic passenger elevator.
   b. Electrical work to provide power and telephone wiring from disconnect switch in equipment room to hoistway and elevator.

2. Comply with the requirements of ANSI A17.1.

3. Comply with NFPA codes relating to electrical work, elevators, and fire-resistance ratings of hoistway entrances. Comply with NFPA 80 and provide UL labeled entrances with 30 minute temperature rise labels.

4. Comply with MDPS regulations when in conflict with ANSI A117.1 and ANSI A17.1. Where conflicts exist between codes and standards, MDPS Elevator Code shall take precedent.

5. Manufacturers: Provide products of one of the following manufacturers that meet or exceed requirements specified:

   a. Dover Elevator Co.
   b. Montgomery Elevator Co.
   c. Otis Elevator Co.
   d. Schindler Elevator Corp.
   e. U. S. Elevator Co.

6. Product: Provide pre-engineered, packaged or custom hydraulic elevator unit that fulfill the Specification requirements and have the features and characteristics scheduled.

7. Single Car Elevator Control: Provide solid state "Selective Collective Automatic Operation", as defined by ANSI A17.1, for each hydraulic elevator.

8. Passenger Elevator:

| | |
|---|---|
| Quantity: | One |
| Type: | Passenger |
| Elevator No.: | 1 |
| Speed: | 100 fpm |
| Capacity: | 2,500 lb. |
| Landings Served: | Five |
| Number of Openings: | Five |
| Operation: | Simplex Selective Collective |
| Door Operation: | Single Speed Side Opening |
| Power Supplied: | 480 volts, 3-phase, 60 hertz |
| Car Enclosure: | Stainless steel panels on walls and ceilings |
| Door Finish: | Stainless steel on cab and hoistway doors |

END OF SECTION

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# FIRE PROTECTION SYSTEMS

## NARRATIVE REPORT

The following is the Fire Protection system narrative, which defines the scope of work and capacities of the Fire Protection system, as well as, the Basis of Design.

1. CODES

   A. All work installed under Section 210000 shall comply with the MA Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Fire Protection work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. In accordance with the provisions of the Massachusetts Building Code, a school building of greater than 12,000 s.f. must be protected with an automatic sprinkler system.

4. DESCRIPTION

   A. The new building will be served by a new 8-inch fire service, double check valve assembly, wet alarm valve complete with electric bell, and fire department connection meeting local thread standards.

   B. System will be a combined standpipe/sprinkler system with control valve assemblies to limit the sprinkler area controlled to less than 52,000 s.f. as required by NFPA 13-2013.

   C. Control valve assemblies shall consist of a supervised shutoff valve, check valve, flow switch and test connection with drain. Standpipes meeting the requirements of NFPA 14-2013 shall be provided in the egress stairwells and in the Stage area.

   D. All areas of the building, including all finished and unfinished spaces, combustible concealed spaces, all electrical rooms and closets will be sprinklered.

   E. All sprinkler heads will be quick response, pendent in hung ceiling areas and upright in unfinished areas.

5. BASIS OF DESIGN

   A. The mechanical rooms, kitchen, science classrooms, and storage rooms are considered Ordinary Hazard Group 1; stage is considered Ordinary Hazard Group 2; all other areas are considered light hazard.

B. Required Design Densities:

Light Hazard Areas = 0.10 GPM over 1,500 s.f.
Ordinary Hazard Group 1 = 0.15 GPM over 1,500 s.f.
Ordinary Hazard Group 2 = 0.20 GPM over 1,500 s.f.

C. Sprinkler spacing (max.):

Light Hazard Areas = 225 s.f.
Ordinary Hazard Areas = 130 s.f.

D. A flow test will be performed to confirm the Municipal water supply capacity.

6. DOUBLE CHECK VALVE ASSEMBLY

A. Double check valve assembly shall be MA State approved, U.L./F.M. approved, with iron body bronze mounted construction complete with supervised OS & Y gate valves and test cocks. Furnish two spare sets of gaskets and repair kits.

B. Double check valve detector assembly shall be of one of the following:

1. Watts Series 757-OSY
2. Wilkins 350A-OSY
3. Conbraco Series 4S-100
4. Or equal

7. PIPING

A. Sprinkler piping 1-1/2 in. and smaller shall be ASTM A-53, Schedule 40 black steel pipe. Sprinkler/standpipe piping 2 in. and larger shall be ASTM A-135, Schedule 10 black steel pipe.

8. FITTINGS

A. Fittings on fire service piping, 2 in. and larger, shall be Victaulic Fire Lock Ductile Iron Fittings conforming to ASTM A-536 with integral grooved shoulder and back stop lugs and grooved ends for use with Style 009-EZ or Style 005 couplings. Branch line fittings shall be welded or shall be Victaulic 920/920N Mechanical Tees. Schedule 10 pipe shall be roll grooved. Schedule 40 pipe, where used with mechanical couplings, shall be roll grooved and shall be threaded where used with screwed fittings. Fittings for threaded piping shall be malleable iron screwed sprinkler fittings.

9. JOINTS

A. Threaded pipe joints shall have an approved thread compound applied on male threads only. Teflon tape shall be used for threads on sprinkler heads. Joints on piping, 2 in. and larger, shall be made up with Victaulic, or equal, Fire Lock Style 005, rigid coupling of ductile iron and pressure responsive gasket system for wet sprinkler system as recommended by manufacturer.

10. SPRINKLERS

A. All sprinklers to be used on this project shall be Quick Response type. Sprinklers shall be manufactured by Tyco, Victaulic, Viking, or equal.

B. Furnish spare heads of each type installed located in a cabinet along with special sprinkler wrenches. The number of spares and location of cabinet shall be in complete accord with NFPA 13-2013.

C. Upright sprinkler heads in areas with no ceilings shall be Tyco Model "TY-FRB" Quick Response, upright natural brass finish heads. Include heavy duty sprinkler guards in all mechanical rooms and storage rooms.

D. Sidewall heads shall be Tyco Model "TY-FRB" Quick Response with white polyester head and escutcheon.

E. Pendent wet sprinkler heads shall be Tyco Model "TY-FRB" Quick Response recessed adjustable escutcheon, white polyester finish.

F. Concealed heads shall be Tyco Model "RFII" Quick Response concealed type, 1-1/2 inch adjustment white cover plate. In special areas, as may be noted on the Drawings, provide alternate cover plate finishes.

G. Use of flexible stainless steel hose with fittings for fire protection service that connect sprinklers to branch lines in suspended ceilings is acceptable. Flexible hoses shall be UL/FM approved and shall comply with NFPA 13 standards. Hose assemblies shall be type 304 stainless steel with minimum 1-inch true-bore internal hose diameter. Ceiling bracket shall be galvanized steel and include multi-port style self-securing integrated snap-on clip ends that attach directly to the ceiling with tamper resistant screws.

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## PLUMBING SYSTEMS

## NARRATIVE REPORT

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design. The Plumbing Systems shall be designed and constructed for ***LEED v4*** where indicated on this narrative.

1. CODES

   A. All work installed under Section 220000 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. The Plumbing Systems that will serve the project are cold water, hot water, tempered water, sanitary waste and vent system, grease waste system, special waste system, storm drain system, and natural gas.

   B. The Building will be serviced by Municipal water and Municipal sewer system.

   C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. DRAINAGE SYSTEM

   A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. System runs from 10 feet outside building and terminates with stack vents through the roof.

   B. A separate Grease Waste System starting with connection to an exterior concrete grease interceptor running thru the kitchen and servery area fixtures and terminating with a vent terminal through the roof. Point of use grease interceptors are to be provided at designated kitchen fixtures. The grease interceptor is provided under Division 33 scope.

   C. Storm Drainage system is provided to drain all roofs with roof drains piped through the building to a point 10 feet outside the building.

   D. Drainage system piping will be service weight cast iron piping; hub and spigot with gaskets for below grade; no hub with gaskets, bands and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type ‘L’ copper.

E. A separate Special Waste System shall be provided starting with a connection to an interior limestone chip acid neutralizer, running thru the building to collect science classroom fixtures and terminating with vent terminals through the roof. Special Waste and Vent piping will be Schedule 40 electric heat fused polypropylene piping, fittings and traps, flame retardant above grade and non-flame retardant below ground.

5. WATER SYSTEM

A. New 4-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer will be provided.

B. Cold water distribution main is provided. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

C. Water piping will be type 'L' copper with wrot copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high density fiberglass.

D. A dedicated non-potable water system will be provided to Science Classrooms. Water system will be protected with a reduced pressure backflow preventer.

E. Tepid (70 deg. F – 90 deg. F) water will be provided to the emergency shower/eyewash fixtures in Science Classrooms as required by code.

F. Domestic hot water will be provided with electric, point-of-use, instantaneous water heaters.

6. FIXTURES ***LEED v4***

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.

B. Fixtures shall be the manufacturer's guaranteed label trademark indicating first quality. All acid resisting enameled ware shall bear the manufacturer's symbol signifying acid resisting material.

C. Vitreous china and acid resisting enameled fixtures, including stops, supplies and traps shall be of one manufacturer by Kohler, American Standard, or Eljer, or equal. Supports shall be Zurn, Smith, Josam, or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.

D. Fixtures shall be as scheduled on drawings.

1. Water Closet: High efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallon per flush-flush valve.

2. Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated 0.13 gallon per flush-flush valve.

3. Lavatory: Wall hung/countertop ADA lavatory with 0.35 GPM metering mixing faucet.

4. Sink: MAAB/ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.

5. Drinking Fountain: Barrier free hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

6. Janitor Sink: 24 x 24 x 10 Terrazo mop receptor Stern-Williams or equal.

7. Laboratory Sinks: Faucets with vacuum breakers and 0.74 GPM aerators.

7. DRAINS

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

8. VALVES

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.

9. INSULATION

A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

10. CLEANOUTS

A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

B. Cleanouts for Special Waste System shall be Zurn #Z9A-C04 polypropylene cleanout plug with Zurn #ZANB-1463-VP nickel bronze scoriated floor access cover.

11. ACCESS DOORS

A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

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# HVAC SYSTEMS

## NARRATIVE REPORT

The following is the HVAC system narrative, which defines the scope of work and capacities of the HVAC system as well as the Basis of Design. The HVAC systems shall be designed and constructed for ***LEED for Schools v4*** where indicated on this narrative.

1. CODES

All work installed under Division 230000 shall comply with the State of Massachusetts Building Code and all local, IBC 2015, IECC 2015 and IMC 2015 with MA Amendments, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

BASIS OF DESIGN: (MASS CODE)

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter 5 deg. F, Summer 91 deg. F DB 74 deg. F WB

Inside: 70 deg. F +/- 2 deg. F for heating, 75 deg. F +/- 2 deg. F (55% RH) for cooling. Unoccupied temperature setback will be provided (60 deg. F heating (adj.), 85 deg. F cooling (adj.).

Outside air is provided at the rate in accordance with ASHRAE guide 62.1-2013 and the International Mechanical Code as a minimum. All occupied areas will be designed to maintain 800 PPM carbon dioxide maximum.

4. SYSTEM DESCRIPTION

A. Central Heating and Cooling Plant: ***LEED for Schools v4 Credit Ep2 & Ec2***

Heating and cooling for the entire building will be capable of being provided through the use of a high-efficiency geothermal heating and cooling plant including (3) three water to water source simultaneous heating/cooling heat pump chillers with heat recovery with a capacity of 90 tons each. The heat pump chiller units will be located in the Mechanical Room. The heat pump heat recovery chillers will be provided with condenser water from evaporative fluid coolers.

A new supplemental boiler plant shall be provided with (3) 1,600 MBH output electric boilers, each will be located in the mechanical room. Boilers shall each be sized for approximately 50% of the building heating load.

The heat pump chiller plant and supplemental boiler plant will supply heating hot water to heating equipment and systems located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel and copper piping system. The plant shall supply a maximum hot water temperature of 160°F on a design heating day. Primary and standby end suction base mounted pumps with a capacity of 350 gpm and will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency. In addition to new boilers and pumps, new hot water accessories including air separators and expansion tanks shall be provided.

The heat pump chiller plant will distribute between 45°F and 55°F chilled water to the roof mounted air handling units and a compensated chilled water distribution system located throughout the building will distribute between 55°F and 65°F chilled water to the terminal radiant cooling panels and induction units. The chilled water distribution piping will be of the fiberglass insulated schedule 40 type and will be completely separate from the hot water distribution piping system. Chilled water pumps with a capacity of 560 gpm and variable frequency drives (which will control down to maintain a minimum flow to the chiller) will be provided for overall variable flow chilled water system distribution. In addition to pumps, new chilled water accessories including air separators and expansion tanks shall be provided.

Primary and standby condenser water pumps with a capacity of 560 gpm and variable frequency drives (which will control down to maintain a minimum flow to the heat pumps chillers) will be provided for overall variable flow condenser water system distribution. In addition to pumps, new condenser water accessories including air separators and expansion tanks shall be provided.

Net Zero Geothermal Option

As an alternate option, a closed-loop geothermal well system can be utilized in lieu of the fluid cooler and supplemental electric boilers described above. The heat pump heat recovery chillers will be provided with ground-source condenser water from (39) 675’ deep closed loop type ground source geothermal quad wells.

Under this alternate, the plant shall supply a maximum hot water temperature of 130°F on a design heating day and the condenser water pumps will have a capacity of 700 gpm.

B. Classroom Heating, Ventilation & Air Conditioning *(General Classrooms, Art/Music/Drama Rooms, Science Classrooms, Administration Areas, Dining Commons, Gymnasium, Locker Rooms, Multi-Purpose, Stage, Media Center, and Support Areas)* ***(Full Air Conditioning VAV Displacement System)***
***LEED of Schools v4 Credit Ep2 & 4, Ec2, IEQp1, IEQc1, 2, 3, & 4***

The air-conditioned areas are to be served by new air handling units of the recirculation type design providing a fully air conditioned variable volume displacement ventilation air distribution systems.

New air handling units with supply and return fan with VFDs, energy recovery wheels, hot water heating and chilled water cooling with modulating capacity control, and MERV 13 filtration will be provided to serve the new fully air conditioned displacement ventilation system. Supply air will be provided to the space through new insulated, galvanized steel supply duct distribution systems and shall be connected to wall mounted displacement ventilation diffusers located within the classrooms. Return air will be drawn back to the units by ceiling return air registers located within the classroom and will be routed back to the air handling unit by an insulated galvanized sheetmetal return air ductwork distribution system. Supplemental hot water fin tube radiation or ceiling radiant heating will be provided along exterior walls.

Each space and support area will be provided with a variable air volume terminal box and CO2 sensor for demand ventilation control.

It is estimated that the following air handling equipment will be required to serve these areas:

AHU-1: Air handling unit with a capacity of 7,200 CFM (19 tons cooling, 275 MBH heating), to serve the Gymnasium Areas

AHU-3: Air handling unit with a capacity of 32,000 CFM (85 tons cooling, 1200 MBH heating), to serve the Classrooms (North), Art/Music/Drama Rooms, Science Classrooms, Administration Areas, Media Center, and Support Areas

AHU-4: Air handling unit with a capacity of 32,000 CFM (85 tons cooling, 1200 MBH heating), to serve the Classrooms (East), Science Classrooms, Dining Commons, Locker Rooms, Multi-Purpose, Stage, and Support Areas

C. Kitchen, Custodial Support, Receiving:
***LEED for Schools v4 Credit Ep2 & 4, Ec2, IEQp1, IEQc1, 2, 3, & 4***

The kitchen areas shall be provided with a kitchen exhaust fan from a new kitchen exhaust air fan system. It is estimated that a kitchen exhaust fan system with a capacity of 5,000 CFM is required. The kitchen will be heated and provided with make-up air from a 4,500 CFM make-up air handling unit (AHU-2) and will include supply and return fans with VFDs, 170 MBH hot water heating section with modulating capacity control, 12 ton chilled water cooling coil with modulating capacity control, energy recovery wheel, and MERV 13 filtration.

A variable volume kitchen exhaust hood control system consisting of kitchen exhaust stack temperature and smoke density sensors, supply and exhaust fan variable speed drives and associated controller will be provided by the kitchen equipment vendor. This system installation shall be field installed and coordinated with the ATC and Electrical contractors.

D. Lobby, Corridor, and Entry Way Heating:

New hot water ceiling mounted radiant panels, cabinet unit heaters and/or fin tube radiation heating equipment shall be installed to provide heating to these areas. Corridors shall be ventilated from the common circulation air handling unit systems.

E. Custodial Support Areas:

Custodial support areas will be heated and ventilated. Storage areas will be heated by radiation heating equipment. Horizontal type unit heaters will heat areas adjacent to the loading dock. The loading dock and all custodial closets will be exhausted by dedicated exhaust air fan systems.

F. Utility Areas:

Utility areas will be provided with exhaust air fan systems for ventilation, and will typically be heated with horizontal type ceiling suspended unit heaters.

The Main IDF room will be air conditioned by high efficiency ductless AC cooling units approximately (2) Three Ton units.

G. Testing, Adjusting, Balancing & Commissioning:

All new HVAC systems shall be tested, adjusted, balanced, and commissioned as part of the project scope.

H. Automatic Temperature Controls – Building Energy Management System:

A new DDC (direct digital control) automatic temperature control and building energy management system shall be installed to control and monitor building HVAC systems. Energy metering shall be installed to monitor the energy usage of building HVAC systems and utilities (fuel, gas, water).

Lighting control and door access control system shall be integrated into the BMS system.

The control system shall be as manufactured by Johnson Controls (Metasys), Siemens (Apogee) or Delta Controls.

5. TESTING REQUIREMENTS:

A. The mechanical contractor shall provide testing of the following systems with the owner and owner's representative present:

1. Net Zero Option – Ground-source Heat Pump system

2. VRF (Variable Refrigerant Flow) System

3. Air handling unit systems including all indoor and rooftop air handling systems and exhaust air systems

4. Terminal heating and cooling devices

5. Automatic temperature control and building energy management system

B. Testing reports shall be submitted to the engineer for review and approval before providing to the owner.

6. OPERATION MANUALS AND MAINTENANCE MANUALS: When the project is completed, the mechanical contractor shall provide operation and maintenance manuals to the owner.

7. RECORD DRAWINGS AND CONTROL DOCUMENTS: When the project is completed, an as-built set of drawings, showing all mechanical system requirements from contract and addendum items will be provided to the owner.

8. COMMISSIONING: The project shall be commissioned per Section 018000 of the specifications.

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## ELECTRICAL SYSTEMS

## NARRATIVE REPORT

The following is the Electrical system narrative, which defines the scope of work and capacities of the Power and Lighting system as well as the Basis of Design. The electrical systems shall be designed and constructed for ***LEED for Schools v4*** where indicated on this narrative. This project shall conform to a Platinum award level and has a minimum target of a Silver award level. The project has a goal of Net Zero.

1. CODES

   All work installed under Division 26 shall comply with the Massachusetts State Building Code, IBC 2015 and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   The work of Section 260000 is indicated in this narrative report. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

3. SEQUENCE OF OPERATIONS AND INTERACTIONS

   A. Classroom and corridor lighting will be controlled via “addressable relays”, which is achieved through programming. The control of the relays shall be by automatic means such as an occupancy sensor in each classroom and corridors. The lighting controls will be part of the Building Management System.

   B. Exterior lighting will be controlled by photocell “on” and “schedule” for “off” operation. The vehicle circulation area lighting will be controlled by “zones” and will have dimming-level control.

   C. Emergency and exit lighting will be run through life safety panels to be on during normal power conditions as well as power outage conditions.

4. DESCRIPTION OF THE SYSTEMS

   A. Electrical Distribution System:

      1. New construction service ratings are designed for a demand load of 10 watts/s.f. The service capacity will be sized for 1600 amperes with 100% rating at 277/480 volt, 3Ø, 4wire. New lighting and power panels will be provided to accommodate respective loads. The service capacity will be sized for 20% spare capacity. The service will be central to main building and feed other buildings. A single meter will be used for entire site so that future PV will serve all loads on site.

B. Interior Lighting System:

1. Classroom lighting fixtures consist of indirect cove mounted LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also for multi-level switching. Office lighting fixtures will consist of similar fixtures to classrooms. Offices on the perimeter with windows shall have daylight dimming controls.

   In general lighting power density will be 40 percent less than IECC 2015. The power density reduction relates to ***LEED for Schools Credit EAC1.***

2. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming footcandle level will be in compliance with ***LEED for Schools IEQ 6.1.***

3. Gymnasium and multi-purpose lighting will be comprised of indirect cove mounted LED fixtures with dimming drivers. The fixtures will be provided with protective wire guards. The light level will be designed for approximately 40 foot candles.

   Daylight dimming will be provided within 15 feet of skylights or glazing. Daylight dimming controls will be similar in operation to classrooms.

4. Corridor lighting will be comprised of linear indirect lighting using LED light source. The corridor light level will be designed for approximately 20 foot candles. Corridor lighting will be on a schedule through the BMS system control and only “on” during occupied hours. The corridor lighting will have two level control.

5. Cafeteria lighting will be LED fixtures with dimming drivers. The light levels will be designed for approximately 30 foot candles.

6. Kitchen and Servery lighting will consist of recessed 1 ft. x 4 ft. lensed and gasketed LED panels. Light levels will be approximately 50 foot candles.

7. Library lighting will consist of indirect fixtures with LED dimmable drivers. Light levels will be approximately 30 foot candles.

9. Each area will be locally switched and designed for multi-level controls. Each classroom, office space and toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in each room where natural light is available for dimming of light fixtures. The manual controls will allow user to dim each scene.

10. The entire school will be controlled with an automatic lighting control system using the BMS control system for schedule and programming of lights controls.

C. Emergency Lighting System:

1. An interior 300 kW natural gas fuelled indoor emergency generator will be provided. Emergency light fixtures and LED exit signs will be installed to serve all egress areas such as corridors, intervening spaces, toilets, stairs and exit discharge exterior doors. The administration area lighting will be connected to the emergency generator.

2. The generator will be sized to include life safety systems, kitchen refrigerator, non-fossil fuel HVAC equipment (heating for freeze protection) and communications systems.

D. Site Lighting System

1. Fixtures for area lighting will be pole-mounted cut-off 'LED' luminaries in the drop-off areas. Pole heights will be below 12 ft. The exterior lighting will be connected to the BMS system for photocell on and timed off operation. The site lighting fixtures will be dark sky compliant. The illumination level is 0.5 foot candle minimum for parking areas in accordance with Illuminating Engineering Society.

2. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Each classroom will have a minimum of (2) duplex receptacles per teaching wall and (2) double duplex receptacles on dedicated circuits at classroom computer workstations. The teacher's workstation will have a double duplex receptacle also on a dedicated circuit. Refer to drawings.

2. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

3. Corridors will have a cleaning receptacle at approximately 25 foot intervals.

4. Exterior weatherproof receptacles will be installed at exterior doors.

5. A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.

F. Fire Alarm System:

1. A fire alarm and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms. The control panel shall be manufactured by Notifier.

2. Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways.

3. The sprinkler system will be supervised for water flow and tampering with valves.

4. Speaker/strobes will be provided in egress ways, classrooms, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms. A mass notification system shall be provided integral with fire alarm system.

5. Manual pull stations will be provided at exit discharge doors.

6. The system will be remotely connected to automatically report alarms to fire department via wireless master box (32 zones).

G. Uninterruptible Power Supply (UPS):

1. One (1) 24kw, three (3) phase centralized UPS systems will be provided with battery back-up.

2. The system will provide conditioned power to sensitive electronic loads, telecommunication systems, bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage.

3. The UPS systems will also be connected to the stand by generator.

H. Lightning Preventer System:

1. Lightning preventer devices will be provided to provide coverage for the entire building.

2. The lightning preventer equipment will include lightning preventers, conductors, conduits, fasteners, connectors, ground rods, etc.

5. NET ZERO OPTION – NON USE OF FOSSSIL FUELS

The following items are regarding the Net Zero Energy Design for the Electrical Systems without the use of fossil fuels.

The Electrical service will be increased in size to compensate for electric cooking and domestic hot water. The anticipated electrical load is approximately 150 KW. Presently, the service size 1,600 amps, 277/480 volt, 3 phase, 4 wire with 3,000 amp bussing to accommodate the PV System.

The additional service increase of approximately 181 amps will result in utilizing a service of 2,000 amps, 277/480 volt, 3 phase, 4 wire with 4,000 amp bussing to accommodate the PV system.

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6. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

- Lighting and power panels for correct phase balance.
- Emergency generator.
- Lighting control system (interior and exterior).
- Fire alarm system.
- Security system.

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

7. OPERATION MANUALS AND MAINTENANCE MANUALS:

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

8. RECORD DRAWINGS AND CONTROL DOCUMENTS:

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

9. COMMISSIONING

The project shall be commissioned per Section 018000 of the specifications.

10. RENEWABLE ENERGY PROVISIONS

Provisions for a renewable energy system will consist of largest capacity (restricted by roof area) grid connected photovoltaic PV system intended to reduce the facilities demand for electricity and reduce carbon emissions. The photovoltaic system will be installed at a future date. The project will be PV ready.

11. SITE UTILITIES

The Electric, Telephone and Cable TV utilities will be underground for each system provided.

12. CCTV

A Closed Circuit TV system will consist of computer servers with image software, computer monitors and IP based closed circuit TV cameras. The head end server will be located in the head end (MDF) room and will be rack mounted. The system can be accessed from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (SAN) will record all cameras and store this information for 45 days at 30 images per second (virtual real time).

The location of the cameras is generally on exterior building perimeter. The exterior cameras are fixed type.

The system will fully integrate with the access control system to allow viewing of events from a single alarm viewer. Camera images and recorded video will be linked to the access system to allow retrieval of video that is associated with an event.

13. INTRUSION SYSTEM

An intrusion system will consist of security panel, keypads, motion detectors and door contacts. The system is addressable which means that each device will be identified when an alarm occurs. The system is designed so that each perimeter classroom with grade access will have dual tech sensors along the exterior wall and corridors, door contacts at each exterior door.

The system will include a digital communicator to summons the central station in the event of an alarm condition.

The intrusion system will be connected to the automated lighting control system to automatically turn on lighting upon an alarm.

14. CARD ACCESS

A card access system includes a card access controller, door controllers and proximity readers/keypads. Proximity readers will be located at various locations. Each proximity reader will have a distinctive code to identify the user and a log will be kept in memory. The log within the panel can be accessed through a computer.

The alarm condition will also initiate real time recording on the integrated CCTV System. The system may be programmed with graphic maps allowing the end-user to quickly identify alarm conditions and lock/unlock doors.

The system is modular and may be easily expanded to accommodate any additional devices.

Baldwin Elementary School
Brookline, MA
J#680 017 00.00
L#65313/Page 1/February 14, 2019

# TECHNOLOGY SYSTEMS

## NARRATIVE REPORT

The following is the Technology System narrative, which defines the scope of work and capacities of the Communications system infrastructure and Security system as well as the Basis of Design.

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code, IBC 2015, and all local, county, and federal codes, laws, statues, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Technology and Security work and all items incidental thereto, including commissioning and testing.

3. TECHNOLOGY

   A. The data system infrastructure will consist of fiber optic backbone cabling. Horizontal wiring will consist of Category 6A UTP Non-Plenum rated cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate VOIP based voice systems. An IP telephone system will be used.

   B. Each classroom will have 2 data outlets for student computers. Two data with video and audio connections to a wall mounted touch screen monitor will be provided at teacher's station. A wall phone will be provided for communications with administration in each classroom. Wireless access points will be provided in all classrooms and other spaces with (2) CAT6A cables.

   C. A central paging system will be provided and integrated with the telephone system. The speakers shall be IP and manufactured by Valcom with InformaCast License.

   D. A wireless GPS/LAN based master clock system will be provided with 120V wireless remote clocks that act as transceivers.

   E. The Main Distribution Frame (MDF) will contain all core network switching and IP voice switch. Intermediate Distribution Frames (IDFs) will serve each floor/wing of the school. A fiber optic backbone will be provided from each IDF to MDF. The backbone will be designed for 40 Gbps Ethernet.

4. TESTING REQUIREMENTS

A. The Technology and Security Contractors shall provide testing of the following systems with the Owner and Owner's representative present:

- Telephone and data cabling
- Fiber optic backbone cabling
- IP Paging system
- Wireless clock system
- A/V wiring for classrooms

Testing reports shall be submitted to the engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS:

A. When the project is completed, the Technology Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS:

A. When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

7. COMMISSIONING

A. The project shall be commissioned per Commissioning Section of the specifications.

# GEOTECHNICAL ENGINEERING DATA REPORT

# PROPOSED ELEMENTARY SCHOOL

# BROOKLINE, MASSACHUSETTS

## FEBRUARY 15, 2017

Prepared For:

Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116

**PROJECT NO. 6303**

2269 Massachusetts Avenue
Cambridge, MA 02140
www.mcphailgeo.com
(617) 868-1420

February 15, 2017

Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116

Attention: Mr. Philip Gray

Reference: Proposed Elementary School; Brookline, Massachusetts
Geotechnical Engineering Data Report

Ladies and Gentlemen:

This letter documents the results of our subsurface exploration program and geotechnical engineering data report for the proposed elementary school to be located in Brookline, Massachusetts. Refer to **Figure 1** for the general site location.

This letter was prepared in accordance with our proposal for preliminary geotechnical engineering services dated November 30, 2016 and the subsequent authorization of Jonathan Levi Architects. These services are subject to the limitations contained in **Appendix A**.

## Available Information

Available information provided to McPhail Associates, LLC (McPhail) included a 20-scale drawing entitled, "Existing Conditions Plan of Land" (Baldwin Site Plan) dated February 3, 2017 and prepared by Hancock Associates; and a 20-scale drawing entitled, "Existing Conditions Plan Soule Playground" (Soule Site Plan) dated March 11, 1996 and prepared by the Town of Brookline Department of Public Works.

Elevations as referenced herein are in feet and are understood to refer to the Brookline Sewer Datum.

## Existing Conditions and Proposed Site Development

The proposed project site consists of two sites, the Baldwin Site which is currently owned by the Brookline School Department and the Soule Recreation Center Site which is owned by the Brookline Parks and Recreation Department.

The Baldwin Site fronts onto Heath Street to the north, Oak Street to the west and currently includes the existing Baldwin School, playground areas, tennis/basketball court, paved roadways and lightly wooded areas. Bedrock outcrops were observed at various locations throughout the site. The existing ground surface generally slopes downward from north to south across the site ranging from about Elevation +214 just north of the existing school building to about Elevation +183 within the tennis/basketball court.

The Soule Site is located south of the Baldwin Site and extends from Hammond Street to the west to Heath Street to the east. The site contains playing fields, parking lots, associated structures and lightly wooded areas. The existing ground surface generally slopes upward from southwest to northeast across the site from about Elevation +175 along Hammond Street to about Elevation +217 along Heath Street. It is noted that the topography is highly variable within the site with isolated knolls extending as high as Elevation +225 and Elevation +230.

The currently proposed project scope for the Baldwin Site includes the construction of a new 800 student elementary school structure with a gross square footage of approximately 150,000 square feet. It is understood that a new surface parking lot associated with the proposed school is planned to be located within the northeastern portion of the Soule Site.

## Investigation Procedures

On January 9 and 10, 2017, eight (8) borings were completed at the site by Carr-Dee Corp. (Carr-Dee) of Medford, Massachusetts under contract to McPhail. The approximate boring locations are indicated on the enclosed **Figure 2A and Figure 2B**. Please note that boring locations B-2 and B-5 were not accessible at the time of our subsurface exploration program; thus, borings were not performed at these locations.

The borings were performed at both the Baldwin and Soule sites to assess the subsurface soil and groundwater conditions at the site as they relate to foundation design and construction. The borings were performed utilizing truck-mounted and ATV-mounted drilling equipment and advanced using hollow-stem augers. Standard 2-inch O.D. split-spoon samples and standard penetration tests (SPT) were obtained in general accordance with the procedures described in ASTM D1586. With the exception of boring B-10, the borings were terminated within a natural glacial till deposit or weathered bedrock at depths ranging from about 1.6 to 16.5 feet below the existing ground surface. Boring B-10 was attempted at two locations and encountered refusal on what was believed to be obstructions in the fill deposit at depths of about 3.3 and 2.6 feet. Boring logs prepared by Carr-Dee are presented in **Appendix B** following the text of this report.

The explorations were monitored by a McPhail representative who performed field layout; prepared field logs; obtained and visually classified soil samples; monitored groundwater conditions in the completed boreholes; made minor relocations of the explorations; and determined the required exploration depths based upon the actual subsurface conditions encountered.

The existing conditions plans for the Baldwin and Soule sites were not available to us prior to our subsurface exploration program. Thus, the boring locations indicated on **Figure 2A** and **Figure 2B** should be considered approximate.

## Subsurface Conditions

Detailed descriptions of the subsurface conditions encountered at the boring locations are presented on the exploration logs contained in **Appendix B**. The generalized subsurface conditions across the site were inferred primarily from the subsurface explorations, but also from our general knowledge of the local geology based on our foundation design and construction experience in the area. The subsurface conditions encountered in the explorations are described below.

At borings B-1 and B-8, an approximate 6-inch and 2-inch thickness, respectively, of asphalt was encountered directly beneath the existing ground surface. At borings B-3, B-4, B-6, and B-10, an approximate 1 to 2-foot thickness of topsoil was encountered directly beneath the existing ground surface.

Underlying the topsoil at B-4 and the fill deposit at B-1, an approximate 1-foot thickness of subsoil was encountered. The subsoil generally consists of a loose to compact, orange-brown silt and sand with a trace of organic material.

Underlying the surface treatments, subsoil, or directly beneath the ground surface at borings B-1, B-7, B-8, B-9, and B-10, a fill deposit was encountered that generally consists of a very loose to compact, dark brown to gray, sand and gravel with some silt and containing trace amounts of brick, mortar, ash, and cinders. With the exception of boring B-10, the fill was observed to extend to depths ranging from about 1.5 to 6.5 feet below the existing ground surface. The fill deposit was not penetrated at boring B-10 due to the presence of below-grade obstructions.

With the exception of borings B-6 and B-10, a natural glacial till deposit was encountered underlying the surface treatments, subsoil, or fill deposit. The surface of the glacial till deposit was generally encountered at depths ranging from about 1.5 to 6.5 feet below the existing ground surface. In general, the glacial till deposit consists of a very dense, gray to gray-brown well-graded mixture of silt and sand and gravel with cobbles.

With the exception of boring B-3, the borings were advanced to split-spoon and/or auger refusal at depths ranging from about 1.7 to 11.9 feet below the existing ground surface. With the exception of boring B-10, refusal of the drilling equipment was believed to have occurred on the bedrock surface, but may have been due to boulders within the glacial till deposit. At boring B-1, refusal of the drilling equipment was believed to have been caused by subsurface obstructions within the fill deposit. Published United States Geological Survey (USGS) bedrock maps for the general area of the site indicate that bedrock consists of Roxbury Conglomerate. Bedrock outcrops consisting of Roxbury Conglomerate were observed at various locations throughout the site.

Groundwater was observed during drilling in boreholes B-3 and B-4 at depths of about 14 and 8 feet below the existing ground surface, respectively. Due to the relatively impervious nature of the glacial till deposit and underlying bedrock, groundwater at the site is

considered to be "perched" on the surface of the glacial till deposit and/or bedrock during and after precipitation events.

It is anticipated that future groundwater levels across the project site may vary from those reported herein based on such factors such as normal seasonal changes, runoff during or following periods of heavy precipitation, and alterations to existing drainage patterns.

## Preliminary Foundation Design Recommendations

Based on our understanding of the proposed construction and on the subsurface conditions encountered at the site, it is recommended that the proposed school building be supported on conventional spread footing foundations in conjunction with a soil-supported slab-on-grade. The foundations should bear directly on the undisturbed glacial till deposit or underlying bedrock utilizing a maximum design bearing pressure of 4 tons per square foot.

Soil-supported perimeter foundations should be provided with a minimum 4-foot thickness of soil cover as frost protection. Bedrock-supported perimeter footings may be founded 2 feet below exterior grades and should be provided with a 6-inch thick cushion of compacted 3/4-inch crushed stone placed directly over the bedrock surface. Interior foundations should be located such that the top of the foundation concrete is a minimum of 6 inches below the underside of the lowest level slab.

It is recommended that the portions of the proposed school building extending below the adjacent exterior grades be provided with perimeter and underslab drainage in order to protect against intrusion of groundwater that may become temporarily "perched" on the surface of the glacial till deposit and/or bedrock during precipitation events.

Depending upon the location of the proposed school building and the elevation of the lowest level floor slab, bedrock excavation may be required for construction of footings, slabs-on-grade and utilities. Based on the extent of the bedrock excavation and the quality of the bedrock, shallow rock excavation may be feasible using mechanical means such as conventional excavating equipment, a hoe ram, or a combination of a hoe ram and line drilling. Where bedrock removal cannot be accomplished using mechanical means, it is recommended that controlled blasting techniques be employed to limit the depth of overblast below the proposed finished grades or foundation elevations, to minimize the potential of damage to adjacent structures due to vibration, and to create a uniform exposed rock cut face.

## Final Comments

Based on our current understanding of the project scope, a final subsurface exploration program will need to be conducted to obtain supplemental geotechnical information for final foundation design and for foundation pricing by potential Contractors. In addition, a final foundation engineering report should be prepared in conjunction with the final subsurface

exploration program which provides final foundation recommendations and construction considerations for the proposed school building.

It is recommended that McPhail be retained to provide design assistance to the design team during the final design phase of this project. The purpose of this involvement would be to review the structural foundation drawings and foundation notes for conformance with the recommendations presented herein and to generate the earthwork and aggregate pier specification sections for inclusion into the Contract Documents for construction.

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

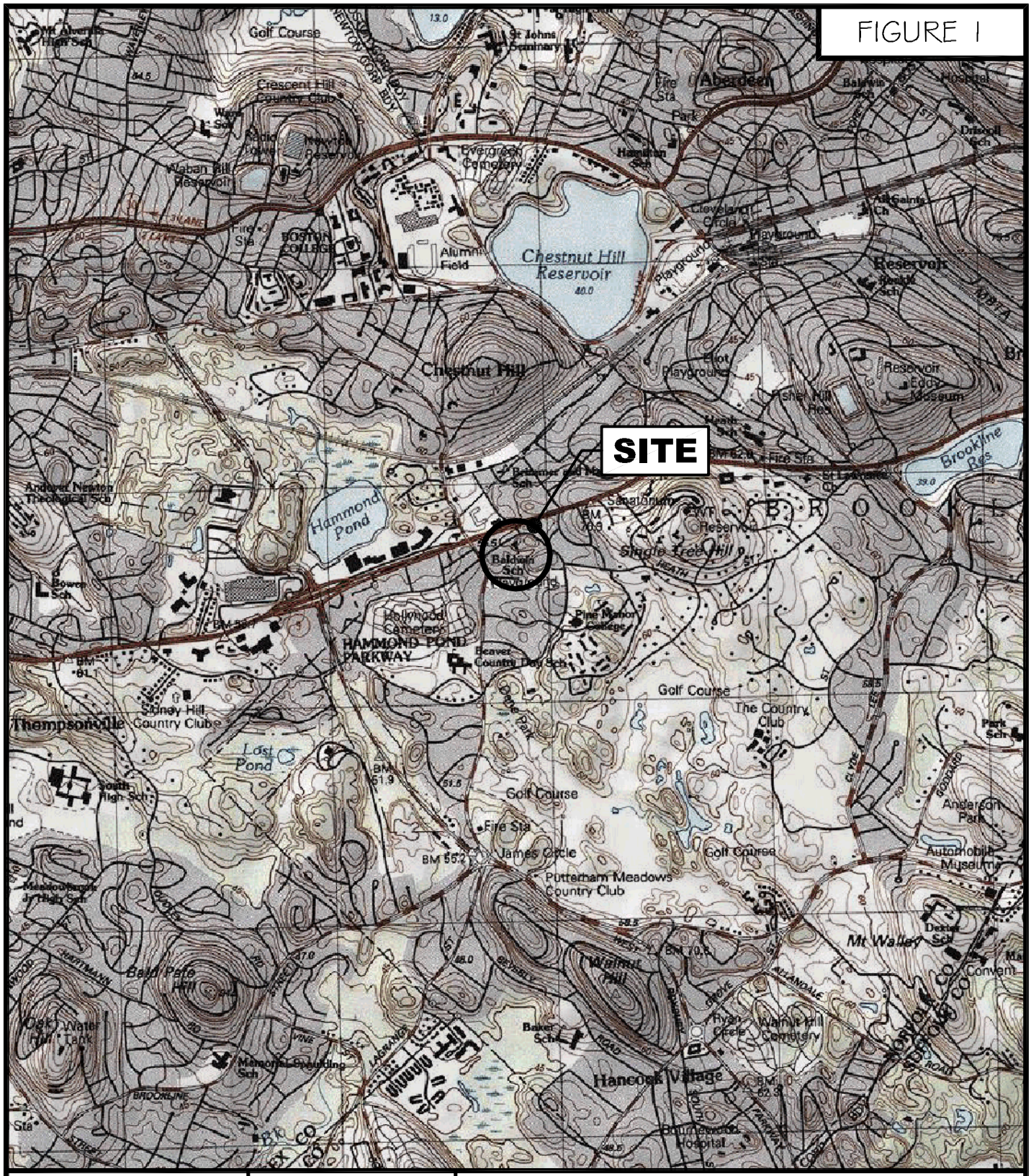
Scott S. Smith, P.E.

Chris M. Erikson, P.E.

SSS/cme

N:\Working Documents\Reports\6303 GDR 021517.docx

FIGURE 1

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N

SCALE 1:25,000

# PROJECT LOCATION PLAN

## PROPOSED ELEMENTARY SCHOOL

BROOKLINE MASSACHUSETTS

FIGURE 2A

NORTH

HEATH STREET

DUNSTER ROAD

OAK STREET

OAK PLACE

#490
EXISTING BALDWIN SCHOOL BUILDING
2 STORY
BRICK

PLAYGROUND AREA

TENNIS/BASKETBALL COURT

JON ROTENBERG
DEED BOOK 6975, PAGE 172
MAP 432, LOT 25

JEFFERY H. SPIEGEL REVOCABLE TRUST
&
ONIR LESHEM SPIEGEL REVOCABLE TRUST
DEED BOOK 6975, PAGE 172
MAP 432, LOT 23-06

DANIEL J. CROWLEY & SUZANNE C. CROWLEY
DEED BOOK 31610, PAGE 313
MAP 432, LOT 36-04

TOWN OF BROOKLINE
"SOULE RECREATION CENTER"
DEED BOOK 3836, PAGE 409
MAP 432, LOT 08

AMAL K. ARNAOUT
DEED BOOK 23388, PAGE 381
MAP 432, LOT 17

HEATH ONE LLC
"THE HAMMONDS CONDOMINIUM"
DEED BOOK 18882, PAGE 347
MAP 432, LOT 18

BROOKLINE DEVELOPMENT CORP. LLC.
"15-19 OAK STREET CONDOMINIUM"
DEED BOOK 23353, PAGE 210
MAP 432, LOT 18-01

LEGEND

⊕ — APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP ON JANUARY 9 AND 10, 2017 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "EXISTING CONDITIONS PLAN OF LAND" DATED JANUARY 19, 2016 BY HANCOCK ASSOCIATES.

GRAPHIC SCALE
40 0 40 80

PROPOSED ELEMENTARY SCHOOL
BROOKLINE MASSACHUSETTS
SUBSURFACE EXPLORATION PLAN
FOR
JONATHAN LEVI ARCHITECTS
BY
McPHAIL ASSOCIATES, LLC

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
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Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)
www.mcphailgeo.com

Date: FEBRUARY 2017 | Dwn: F.G.P. | Chkd: S.S.S. | Scale: 1" = 40'
Project No: 6303

FILE NAME: N:\Acad\JOBS\6303\6303-F02A.dwg

FIGURE 2B

NORTH

HEATH ST.

S51°12'44"E 35.00'

R. 86.0' 18.78'

DRIVEWAY

67.02'

R.120.0'

327.20'

N66°44'13"E

Old Property Line

JOHN HOWLAND

R.109.0'

48.51'

57.12'

R.55.0'

49.00'

134.00'

STONE WALL LEDGE

R. N76°18'

139.65'

R. 164.42'

109.55'

S3°23'35"E

WOODLAND RD.

B-7

B-8

B-9

B-10

IRON PIN

WOODS LINE, TYP.

WOODS

STONE WALL

STEPS

BEECH TREE

34" DEAD

26" DEAD

42"

38"

52"

14"

22"

8"

20"

18"

10"

4"

12"

8"

201'

200'

205

210

215

220

225

227

228

229

LEGEND

— APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP ON JANUARY 9 AND 10, 2017 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "EXISTING CONDITIONS PLAN" DATED MARCH 11, 1996 BY TOWN OF BROOKLINE DEPARTMENT OF PUBLIC WORKS.

GRAPHIC SCALE

40 0 40 80

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PROPOSED ELEMENTARY SCHOOL

BROOKLINE MASSACHUSETTS

SUBSURFACE EXPLORATION PLAN

FOR

JONATHAN LEVI ARCHITECTS

BY

McPHAIL ASSOCIATES, LLC

| Date: FEBRUARY 2017 | Dwn: F.G.P. | Chkd: S.S.S. | Scale: 1" = 40' |
|---|---|---|---|
| Project No: 6303 | | | |

FILE NAME: N:\Acad\JOB\6303\6303-FO2B.dwg

# APPENDIX A:

# LIMITATIONS

## LIMITATIONS

This preliminary report has been prepared on behalf of and for the exclusive use of Jonathan Levi Architects for specific application to the proposed school building to be located in Brookline, Massachusetts in accordance with generally accepted soil and geotechnical 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 preliminary recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by McPhail Associates, LLC.

The analyses and preliminary recommendations presented in this report are based upon the data obtained from the subsurface explorations 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 re-evaluation of the recommendations of this report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.

# APPENDIX B:

# CARR-DEE CORP.'S
# BORING LOGS B-1 THROUGH B-10

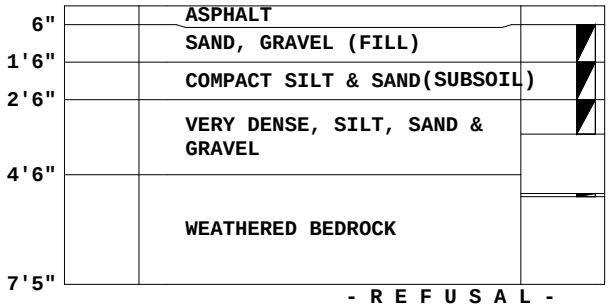
# CARR-DEE CORP.

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

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 1




S#1, 6" to 1'6" (11-7) RECOVERED 8 in.
S#1A, 1'6" to 2'6" (5-5) RECOVERED 8 in.
S#2, 2'6" to 3'5" (16-100/5") RECOVERED 2 in.
S#3, 5' to 5'1" (100/1") RECOVERED 1 in.

(NO PENETRATION WITH AUGERS)
NO WATER ENCOUNTERED
SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 7'5"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-9-2017

All samples have been visually classified by . 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 (±).

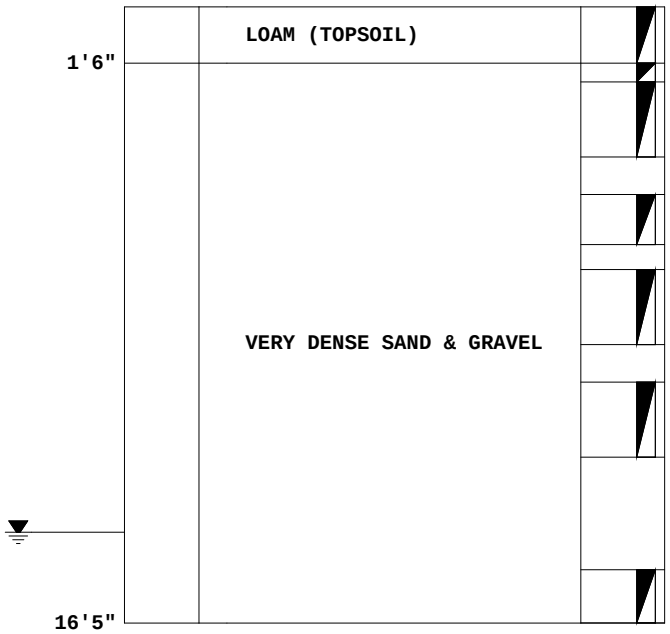
# CARR-DEE CORP.

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

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 3




S#1, 0' to 1'6"
(6-3-7)
RECOVERED 16 in.

S#1A, 1'6" to 2'
(13)
RECOVERED 4 in.

S#2, 2' to 4'
(16-27-43-81)
RECOVERED 18 in.

S#3, 5' to 6'4"
(29-44-100/4")
RECOVERED 14 in.

S#4, 7' to 9'
(27-25-36-40)
RECOVERED 16 in.

S#5, 10' to 12'
(25-30-33-37)
RECOVERED 18 in.

S#6, 15' to 16'5"
(44-74-100/5")
RECOVERED 14 in.

WATER LEVEL 14'
SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 15'0"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-10-2017

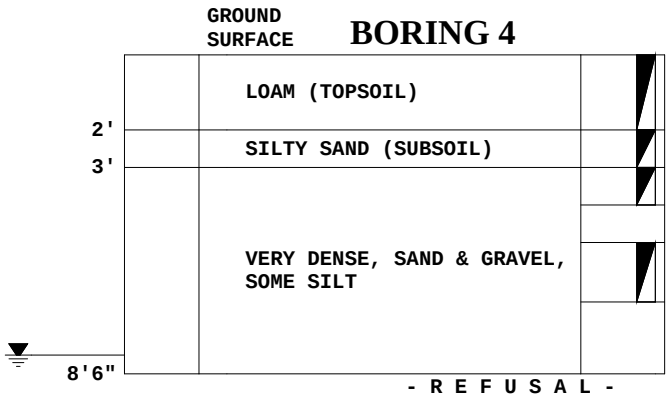
All samples have been visually classified by . Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 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 (±).

# CARR-DEE CORP.

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

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.




- R E F U S A L -

(100 BLOWS 2" S.S., 140 LB. WGT., NO PENETRATION)

WATER LEVEL 8'
SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 8'6"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-10-2017

All samples have been visually classified by . 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 (±).

# CARR-DEE CORP.

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

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 6

GROUND SURFACE

| | | |
|---|---|---|
| 1' | LOAM (TOPSOIL) | S#1, 0' to 1' (3-5) RECOVERED 8 in. |
| 1'7" | POSSIBLE WEATHERED ROCK | S#1A, 1' to 1'4" (100/4") RECOVERED 4 in. |

NO WATER ENCOUNTERED

SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 1'7"

DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORRIGAN

DATE STARTED & COMPLETED: 1-10-2017

All samples have been visually classified by . 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 (±).

# CARR-DEE CORP.

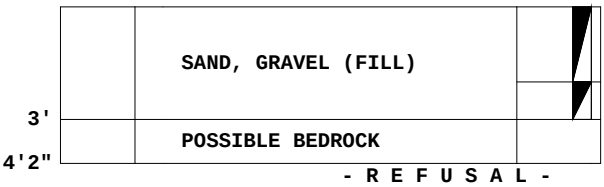
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 7

GROUND SURFACE




S#1, 0' to 2' (3-2-1-1) RECOVERED 6 in.

S#2, 2' to 3' (1-1) RECOVERED 3 in.

S#2A, 3' to 3' (100/1") RECOVERED 0 in.

- R E F U S A L -

(NO PENETRATION WITH AUGERS)
NO WATER ENCOUNTERED
SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 4'2"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-9-2017

All samples have been visually classified by . 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 (±).

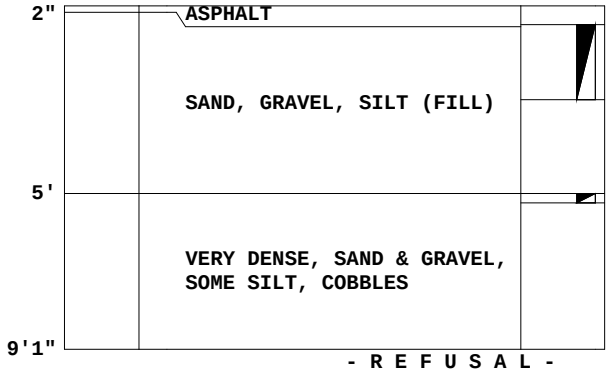
# CARR-DEE CORP.

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

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 8




S#1, 6" to 2'6"
(9-13-16-15)
RECOVERED 18 in.

S#2, 5' to 5'3"
(100/3")
RECOVERED 2 in.

- R E F U S A L -

(100 BLOWS, 2" S.S., 140 LB. WGT., NO PENETRATION)
NO WATER ENCOUNTERED
SIZE OF AUGERS: 2-1/4" I.D., LENGTH: 9'1"
DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-9-2017

All samples have been visually classified by . 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 (±).

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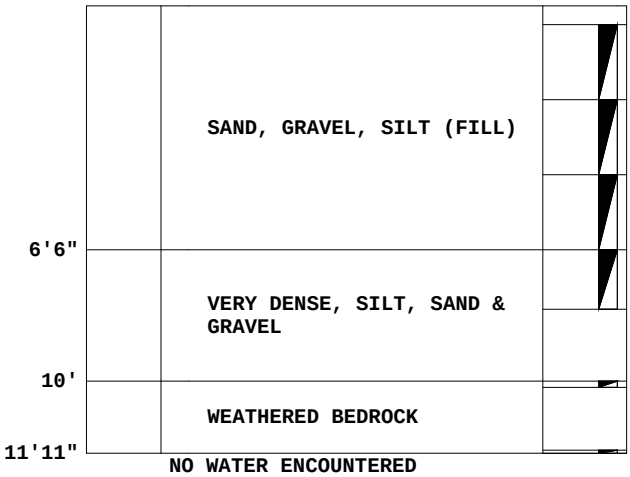
To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 9




S#1, 6" to 2'6"
(25-12-8-5)
RECOVERED 14 in.

S#2, 2'6" to 4'6"
(8-6-5-6)
RECOVERED 8 in.

S#3, 4'6" to 6'6"
(7-5-8-6)
RECOVERED 6 in.

S#4, 6'6" to 8'1"
(17-12-34-100/1")
RECOVERED 10 in.

S#5, 10' to 10'2"
(100/2")
RECOVERED 2 in.

s#6, 11'10" to 11'11"
(100/1")
RECOVERED 1 in.

NO WATER ENCOUNTERED
SIZE OF AUGERS: 2-1/4" I.D.
LENGTH: 11'10"
DRILLER: S. DESIMONE, JR.
INSPECTOR: T. CORMICAN
DATE STARTED & COMPLETED: 1-9-2017

All samples have been visually classified by . 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 (±).

# CARR-DEE CORP.

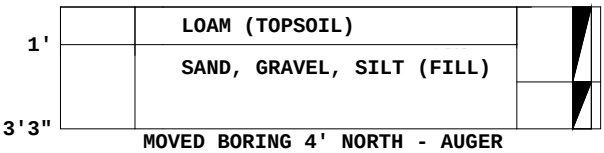
37 LINDEN STREET MEDFORD, MA 02155-0001 Telephone (781) 391-4500

To: MCPHAIL ASSOC., LLC, 2269 MASS. AVE., CAMBRIDGE, MA Date: 1-11-2017 Job No.: 2016-208

Location: BALDWIN SCHOOL & PLAYGROUND, BROOKLINE, MA Scale: 1 in.= 5 ft.

## BORING 10

GROUND SURFACE




LOAM (TOPSOIL)

SAND, GRAVEL, SILT (FILL)

s#1, 0' to 2'
(2-3-13-40)
RECOVERED 8 in.

S#2, 2' to 3'3"
(58-14-100/3")
RECOVERED 1 in.

MOVED BORING 4' NORTH - AUGER
REFUAL AT 2.6 FEET. AUGER HEAD BROKE
NO WATER ENCOUNTERED

DRILLER: S. DESIMONE, JR., INSPECTOR: T. CORMICAN

DATE STARTED & COMPLETED: 1-10-2017

All samples have been visually classified by . 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 (±).

311000 CLEARING AND GRUBBING

A. Description: Perform all site preparation as indicated herein. Unless otherwise indicated, the areas to be cleared, grubbed and stripped shall consist of the entire worksite, with the exception of those areas specifically designated to remain in an undisturbed, natural condition.

B. Functional Requirements:

1. Design Requirements:

a. Cut and remove all roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground in the area of construction, as indicated on the Contract Drawings as the limit of work.
b. Grub and remove all stumps, roots in excess of 1-1/2-inches in diameter, matted roots, brush, timber, logs, concrete rubble and other debris encountered to a depth of 30 inches below original grade or 18 inches beneath the bottom of excavations, whichever is deeper.
c. Strip topsoil and subsoil from all areas to be excavated as detailed on the contract drawings. Topsoil shall be free from brush, trash, stones larger than 2 inches in diameter and other extraneous material. Avoid mixing topsoil with subsoil. Stockpile and protect topsoil in area.
d. Contractor shall dispose of rubbish and debris from site preparation operations by hauling such materials and debris to an approved offsite disposal area. No rubbish or debris of any kind shall be buried on the site.
e. Trees and other vegetation not indicated to be removed in the contract drawings shall remain and shall be protected from damage by all construction operations. Provide protection to prevent damage to surrounding trees, not within the limit of work or specified to be removed, from the felling operations. Clearing operations shall be conducted in a manner so as to provide for the safety of employees and others.

END OF 311000

312000 EARTH MOVING

A. Description: Perform all required excavation, fill and grading to complete the Work as indicated on the contract drawings and as specified herein. The work shall include excavation for drain manholes, drain pipes, and paving; all backfilling, compaction and fill; embankment and grading; disposal of waste and surplus materials; temporary support of excavation, excavation dewatering and surface water control during excavation. All materials not re-used on-site shall be disposed of by the Contractor. Materials required in the Work which are not available from on-site excavated materials shall be imported from approved off-site sources. Unless otherwise indicated, the areas to be cleared, grubbed and stripped shall consist of the entire worksite, with the exception of those areas specifically designated to remain in an undisturbed, natural condition.

B. Functional Requirements:

1. Design Requirements:

a. Structural Fill: Structural fill shall be gravel, sandy gravel, or gravelly sand free of organic material, wood, trash, snow, ice, frozen soil and other materials which may be compressible or which cannot be compacted as specified herein and shall be graded within the following limits:

| Sieve Size | Percent Finer by Weight |
|---|---|
| 4 in | 100 |
| No. 4 | 30 to 90 |
| No. 40 | 10 to 50 |
| No. 200 | 0 to 8 |

b. Controlled Density Fill: Controlled Density Fill shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M4.08.0.

c. Common Fill: Common Fill shall consist of mineral soil free from organic materials, topsoil, wood, trash and other objectionable materials which may be compressible or which cannot be properly compacted. Common Fill shall not contain stones that are greater than 2/3 the lift thickness of common fill being placed. Common fill shall not contain granite blocks, broken concrete, masonry rubble or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling. Snow, ice and frozen soil will not be permitted. Soil excavated as part of the Work which meets the above requirements in this paragraph, as shown by a certified sieve analysis may be used in the Work.

d. Select Common Fill: Select Common Fill shall be as specified above for Common Fill, except that the material shall contain no stones larger than 2-in in diameter.

Soil excavated as part of the Work which meets the requirements of this paragraph, as shown by a properly executed and certified sieve analysis may be used in the Work.

e. Riprap: Riprap shall be sound, durable rock which is angular in shape. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale and organic material, and meet the following Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended:

1) Type 1: M2.02.2 (Dumped Riprap)
2) Type 2: M2.02.4 (Modified Rockfill)
3) Type 3: M2.06.0 (Slope Paving)

. f. Crushed Stone:

1) Crushed stone for temporary access ways, construction entrances, walkways, setting bed for riprap, and sediment filtration devices shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M2.01.3.
2) Dense-graded crushed stone for subbase material in project pavement sections shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, specification M2.01.7.

g. Screened Gravel:

1) Screened gravel shall be used for drainage pipe and drainage structures bedding as indicated or if standing water is observed in the pipe trench prior to installation and at other locations as specified on the Contract Drawings.
2) Screened gravel shall consist of hard, durable, rounded or subangular particles of proper size and gradation and shall be free from sand, loam, clay, excess fines and deleterious materials. The gravel shall be graded within the following limits:

| Sieve Size | Percent Finer by Weight |
|---|---|
| 3-in | 100 |
| No. 4 | 40 to 75 |
| No. 50 | 8 to 28 |
| No. 200 | 0 to 10 |

h. Sand: Sand shall conform to ASTM C33 for fine aggregate.

i. Manufactured Topsoils:

1) Manufactured topsoils shall be friable and capable of promoting and supporting healthy plant growth, as determined by soil testing described in this section, when mixed with fertilizer and soil conditioners as specified. Manufactured topsoils shall be free of slag, stones greater than 2 inches in diameter, plants or their roots, sticks, clay clods, toxic substances or any material harmful to plant growth. Manufactured topsoils shall have a pH between 5.5 and 7.5.
2) Manufactured topsoil - Type I shall contain between 4 and 6 percent organic matter, and shall be used in reinforced steep slope facing and all other grassed areas as indicated.
3) Manufactured topsoils shall be classified as a sandy loam, loam, or sandy clay loam, using the following USDA textural classification system based on the percentage of clay (<0.002mm), silt (0.05 to 0.002mm) and sand (2mm-0.05mm) in the fine earth fraction (<2mm). In addition, the gravel (2mm-2-in) content shall be less than 10 percent.
4) The organic matter content for manufactured topsoils shall be by weight as determined by loss on ignition of moisture free test samples oven dried to a constant weight at a temperature of 100°C. To adjust organic matter content, the manufactured topsoils may be amended with organic amendments.
5) Soluble salts shall not be greater than 160 ppm.

j. Organic Amendments for use in Producing Manufactured Topsoil:

1) On-site topsoil shall be screened and used as organic amendment to create manufactured topsoils.
2) Compost material may also be used as an organic amendment. The compost shall be a stable, humus-like material produced from the aerobic decomposition of organic residues. The residues may include biosolids as well as yard wastes, and agricultural wastes. The compost shall be of a dark brown to black color and be capable of supporting plant growth in conjunction with the addition of fertilizers and other amendments. The composted material shall have been stabilized so as not to have an unpleasant odor. An organic amendment not stabilized and having an objectionable odor may be rejected at the discretion of the Owner.

END OF 312000

312500 EROSION AND SEDIMENTATION CONTROLS

A. Description: Erosion and sedimentation control shall be provided as shown on the Contract Drawings and Order of Conditions by the Framingham Conservation Commission with materials and procedures as specified herein. The plan shall implement erosion and sedimentation control prevention and treatment procedures such that stormwater runoff discharged from the site shall meet the following general requirements:

1. All work shall be performed in accordance with the erosion control measures shown on The Plan.
2. Best management practices (BMPs) shall be used to address storm water pollution prevention in accordance with MADEP Stormwater Management Guidelines & EPA NPDES Regulations.
3. The Plan shall be implemented and installed prior to commencement of earthwork activities.
4. The EPA NPDES Stormwater Pollution Prevention Plan Shall be kept on-site at all times and review / project inspections shall take place as specified therein.

B. Functional Requirements:

1. Design Requirements:

a. In order to minimize erosion, the natural vegetation of the area shall be preserved at locations adjacent to and outside the limits of work as indicated on the Contract Drawings. All earthwork, grading, moving of equipment and other operations likely to cause disturbed soil conditions and erosion and siltation and tracking of sediments, shall be planned and performed in a sequence as to avoid sedimentation and erosion of disturbed soil.

b. Furnish all labor, materials, equipment and incidentals required to perform installation, maintenance, temporary pumping, removal and area cleanup related to erosion and sedimentation control work as indicated and as specified herein.

c. Crushed Stone: For temporary access ways, staging areas, stone filter boxes, stone filter berms, setting bed for riprap, and sediment filtration devices, crushed stone shall conform to the Commonwealth of Massachusetts Department of Highways Standard Specifications for Highways and Bridges, as amended, SSHB M2.01.3.

d. Geosynthetic Materials:

1) Drainage Fabric, Silt Fence, Filter Fabric and Filter Cloth shall be Mirafi Envirofence; American Excelsior “Siltstop” fence or DGIP series siltfence, or approved equal.
2) Stabilization Fabric: Erosion control blanket shall be constructed of a porous, biodegradable geotextile matting specifically manufactured to

retain soil moisture, to hold soil temperatures and to generally stabilize soils where stormwater flows in channels, swales or on recently planted slopes such as Mirafi 100X; Curlex Excelsior, North American Green Bionet 575BN, or approved equal. Erosion control blanket shall be installed to protect soil and seedlings where specified.
The erosion control fabric shall be 'stapled' to the surface which it is installed in accordance with the recommendation of the selected manufacturer. All materials used in the construction of and installation of the fabric must be biodegradable and require no maintenance by the Owner.

e. Sediment Fence:

1) Wooden stakes shall be 4-ft in length, 2-in by 2-in oak.
2) Sediment fence fabric shall be a woven, polypropylene, ultraviolet resistant, selected to provide a barrier to prevent the transport of sediment laden water with fines and debris, yet provide the passage of water.
3) Prefabricated commercial sediment fence may be substituted for built-in-field fence.
4) 1/4-in woven wire mesh shall be galvanized steel or hardware cloth.
5) Temporary mulch
Wood chip mulch or bark chip mulch: Chipped material shall have a uniform consistency and be free of rock and soil. Material shall be stockpiled on the site in approved areas at the direction of the Owner. Straw mulch shall be comprised of threshed straw of oats, wheat, barley, or rye that is free from noxious weeds, mold or other objectionable material. The straw mulch shall contain a minimum of 50 percent by weight of material to be 10-in or longer. Straw shall be in an air-dry condition and suitable for placement with blower equipment.
6) Hay bales shall be bales made of straw of oats, wheat, barley, rye or natural hay and shall be utilized to control sediment runoff during construction activities. Each bale shall be either wire-bound or string tied. Bales shall be placed with bindings oriented around the bale rather than over and under. Furnish oak wood stakes 2-in x 2-in x 4-ft long or 1/2-in x 4-ft long rebar as indicated.
7) Tackifier for use on straw mulch areas shall be a latex acrylic copolymer emulsion specifically manufactured for use as a tackifier. Asphalt tackifier shall not be used.
8) Temporary seeding for erosion control
9) Dust Control
10) Cloth Filters: Cloth filters at catch basins shall be The Dandy Bag as manufactured by Dandy Products, Inc. or equal; Siltsack as manufactured by Jennian Enterprises; Drainpac as manufactured by Drainworks.

END OF 312500

321 216 ROADWAY PAVEMENT

A. Description: Furnish labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Hot-mix asphalt pavement at all excavations made in any existing pavement.
2. Pavement-marking paint.

B. Functional Requirements:

1. Design Requirements:

a. Hot –mix asphalt pavement bituminous concrete paving shall be Class 1, as specified in Mass DOT Standard Specifications for Highways and Bridges Section M3.11.0
b. Asphalt tack coat shall consist of either emulsified asphalt, Grade RS-1 conforming to Mass DOT Section M3.03.0, or cutback asphalt, Grade RC-70 or RC-250 conforming to Mass DOT Section M3.02.0.
c. Pavement-marking paint shall be acrylic/latex type, low VOC, traffic marking paint.

END OF 321216

## SECTION 321318 – DECORATIVE CONCRETE PAVING

1. Description of Work: Provide decorative concrete paving and related items, as indicated on the Drawings and as specified herein. Work of this Section includes, but is not limited to:

   a. Stamped concrete paving.

2. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

   a. Use flexible or uniformly curved forms for curves of a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.
   b. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

3. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

4. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

5. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars. Cut bars true to length with ends square and free of burrs.

6. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

   a. Portland Cement: ASTM C 150, white portland cement Type I.

7. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

   a. Maximum Aggregate Size: 3/4 inch (19 mm).
   b. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

8. Water: Potable and complying with ASTM C 94/C 94M.

9. Air-Entraining Admixture: ASTM C 260.

10. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

    a. Water-Reducing Admixture: ASTM C 494/C 494M, Type A**[, colored]**.
    b. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
    c. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.

11. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) ChemMasters.
        2) Davis Colors.
        3) Scofield, L. M. Company.
        4) Solomon Colors, Inc.

        Specialty Concrete Products, Inc.

12. Stamp Mats: Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) Bomanite Corporation.
        2) Matcrete Precision Stamped Concrete Tools.
        3) Scofield, L. M. Company.
        4) Stampcrete International Ltd.

13. Stamp Tools: Open-grid, aluminum or rigid-plastic stamp tool capable of imprinting joint patterns on plastic concrete.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following]:

        1) Matcrete Precision Stamped Concrete Tools.
        2) Scofield, L. M. Company.
        3) SuperStone, Inc.

END OF SECTION

321220 PEDESTRIAN PAVEMENT

A. Description: Furnish and install concrete walkways.

B. Functional Requirements:

1. Design Requirements:

a. Concrete shall be no less than 4,000 psi at 28 days with 5% to 7% air entrainment.
b. Welded wire fabric shall conform to ASTM A185 and shall be of size and gauge shown.
c. Expansion joint filler shall be bituminous type, ½-inch thick meeting AASHTO M-213-65.
d. Concrete sidewalks shall have a broom finish.

END OF 321220

**SECTION 32 90 00**
**PLANTING**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The conditions and general requirements of the Contract, Division 0 and applicable parts of Division 1, apply to the work under this Section.

B. All references to products by manufacturer, trade name or performance Specifications bearing the connotation "or Approved Equal" shall be as determined by the Landscape Architect and the City, per MGL c. 30 s. 39M, part b, criteria 1.

C. Contractor shall comply with all laws, regulations, and quarantines for agricultural and horticultural products.

1.2 WORK INCLUDED

A. The work of this Section consists of the provision of all materials, labor, equipment and the like for the complete execution of all lawn establishment by sodding and related items as indicated on the Drawings and/or as specified herein.

B. Work includes but is not limited to the following:

1. Topsoil (loam borrow), fine grading and loaming;
2. Plant Materials;
3. Soil additives;
4. Mulch;
5. Hydro-seeded Lawns;
6. Sod;
7. Meadow Grass Seed Mix;
8. Erosion Control Fabric;
9. Maintenance, watering, and protection of plantings until final acceptance.

1.3 SPECIAL CONDITIONS

A. No burning will be permitted on the project site.

B. Prior to commencing work, the Contractor shall submit a plan for legal disposal of removed materials, acceptable to the Owner.

1.4 REFERENCES

A. Examine all other Sections of the Specifications and all Drawings for the relationship of the work under this Section and the work of other trades. Cooperate with all other trades and all departments of the City and coordinate all work under this Section therewith.

B. Related items include but are not limited to work under the Sections listed below:

1. Section 02 41 00 – Demolition and Site Preparation
2. Section 31 00 00 – Earthwork

1.5 SUBMITTALS

A. Prior to ordering the below listed materials, submit representative samples to Landscape Architect for selection and approval, in accordance with requirements of General Condition and special provisions as follows. Do not order material until Landscape Architect's approval has been obtained. Delivered materials shall closely match the approved samples.

1. Topsoil: The Contractor shall provide a one (1) cubic foot representative sample from each proposed source for testing and approval as directed by the Landscape Architect. The Contractor shall deliver samples to testing laboratory prior to any loaming and shall have the testing report sent directly to the Landscape Architect, and pay all costs.

a. Mechanical and chemical (pH soluble salts) analysis shall be by public extension service agency or a certified private testing laboratory in accordance with the current standards of the Association of Official Agricultural Chemists.

b. Report shall be submitted at least one (1) month before any loaming is to be done. Soil tests shall be for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and Lead, and show acidity and USDA classification of the soil.

2. Submit a written guarantee of conformance to specifications for sod.

3. Submit material specifications and installation instructions where applicable attesting that soil additives meet the requirements specified.

1.6 DEFINITIONS

A. The following related items are included herein and shall mean:

1. S.S.H.B.: The Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges, latest edition
2. A.O.A.C.: Association of Official Agricultural Chemists
3. A.A.N.: American Association of Nurserymen

1.7 PRODUCT DELIVERY AND HANDLING

A. All topsoil, whether from stockpiles on site or loam borrow, shall be stored in piles not to exceed six feet in height, and shall not be handled when frozen or not in a friable condition.

1.8 CERTIFICATION OF ACCEPTANCE AND GUARANTEE

A. The Contractor shall be responsible for maintenance until the LATER of: the acceptance of the project as substantially complete, or 90 days after installation. After the minimum ninety (90) day maintenance period and substantial completion of the project, the Contractor shall request of the Landscape Architect, in writing, an

inspection to determine whether the lawns and plantings are acceptable. If the plant material and workmanship are acceptable, written notice will be given by the Landscape Architect to the Contractor stating that the guarantee period begins from the date of the Certificate of Acceptance. Acceptance shall be given only for the entire lawn area covered by the Contract, and for all plantings.

B. Lawns shall exhibit a uniform, thick, well-developed stand of grass, which has received a minimum of three cuttings. Lawn areas shall have no bare spots in excess of four inches in diameter, and bare spots shall comprise no more than two percent of the total area of the lawn. No lawn areas shall exhibit signs of damage from erosion, washouts, gullies, or other causes.

C. Lawns, shrubs, and perennials shall be guaranteed for a period of one calendar year after inspection and acceptance and shall be alive and in satisfactory growth at the end of the guarantee period. Trees 3” caliper or greater shall be guaranteed for a period of two calendar years after inspection and acceptance.

D. At the end of the guarantee period, inspection will be made again. Any lawn area or planting covered under this contract that is dead or unsatisfactory shall be replaced according to the planting seasons called for herein, until the lawn or planting lives through one guarantee period. A final inspection for acceptance will be made after the replacement plantings have lived through one guarantee period. Contractor shall test soil and add fertilizer and lime as needed in the fall after installation.

E. All replacements shall be the same turf mix (sod), seed mix (meadow mix and seeded lawns) or species and cultivar (plantings) as originally installed and accepted. The cost shall be borne by the Contractor.

## 1.9 SITE CONDITIONS

A. All areas to be planted shall be inspected by the Contractor before starting work and any defects such as incorrect grading, etc., shall be reported to the Landscape Architect prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be planted and he shall assume full responsibility.

B. Environmental Requirements: Contractor shall not work on or with soils when they are dry, wet, or frozen. Field Test: Form soil in palm of hand; if soil retains shape and crumbles upon touching, then it may be worked (if it will not retain its shape, it is too dry; if it does not crumble, it is too wet). Landscape Architect shall be final authority on condition of soil.

## 1.10 PROTECTION

A. The Contractor shall be liable for any damage to property caused by the work, and all areas disturbed shall be returned to their original condition to the satisfaction of the Landscape Architect. During all work of this section, the Contractor shall protect all site improvements from contact with agricultural chemicals, soil amendments, and fertilizers.

B. The Contractor shall provide all erosion, sedimentation, and environmental controls necessitated by site and governing codes.

C. Damage no plant to remain by burning, by pumping of water, by cutting of live roots or branches, or by any other means. No plant to be saved shall be used for crane

stays, guys, or their fastenings. Vehicles shall not be parked within the dripline of trees to remain, or wherever damage may result to trees to be saved. Construction material shall not be stored beneath trees to be saved. See Drawings for Tree Protection.

## PART 2 - PRODUCTS

### 2.1 TOPSOIL/LOAM

A. Loam shall be a "fine sandy loam" or a "sandy loam" determined by mechanical analysis and based on the USDA classification system. It shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one inch, lumps, plants and their roots, debris and other extraneous matter over one inch in diameter or excess of smaller pieces of the same materials as determined by the Landscape Architect. It shall not contain toxic substances harmful to plant growth. Loam shall contain not less than 4% nor more than 10% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 F, plus or minus 9.

B. Loam shall have an acidity range of pH 5.6 to pH 6.5.

C. The amount of either sulfur or limestone required to adjust the planting loam to the proper pH range (above) shall be determined by the Landscape Architect on the basis of soil tests as specified herein.

D. Soil tests for this area shall be through the University of Massachusetts Amherst Cooperative Extension Soil Testing Laboratory, with recommendations for both Grasses/Lawns and Trees/Shrubs, or Approved Equal testing service (submit proposed alternative before testing).

### 2.2 PLANT MATERIALS

A. The Contractor shall furnish and plant all plants shown on the Drawings, as specified, and in quantities listed on the Plant List. No substitutions will be permitted. All plants shall be nursery-grown unless specifically authorized to be collected.

B. Plants shall be in accordance with the USA Standard for Nursery Stock of the American Association of Nurserymen, latest edition.

C. All plants shall be typical of their species or variety and shall have a normal habit of growth and be legibly tagged with the proper name. Only plant stock grown within the hardiness Zones 1 through 6, as established by the United States Department of Agriculture, will be accepted. The Contractor's suppliers must certify in writing that the stock has actually been grown under Zone 6 or hardier conditions for a minimum of 2 years. Plants not so certified will not be accepted.

D. The root system of each shall be well provided with fibrous roots. All parts shall be moist and show active green cambium when cut. They shall be sound, healthy, and vigorous, well-branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs or larvae.

E. All plants must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated eight (8) ounce burlap, firmly held in place by a stout cord or wire. The diameter and depth of the balls of earth must be sufficient to

encompass the fibrous and root feeding system necessary for the healthy development of the plant. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and balls shall remain intact during all operations. All plants that cannot be planted at once must be heeled in by setting in the ground and covering the balls with soil and then watering them.

F. The caliper of the trees shall be not less than the minimum size designated. Take caliper measurement six inches (6") above ground level up to and including four (4") caliper size and twelve inches (12") above ground for larger sizes. The trunk of each tree shall be a single trunk growing from a single unmutilated crown of roots. No part of the trunk shall be conspicuously crooked as compared with normal trees of the same variety. The trunk shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire or other causes. No pruning wounds shall be present having a diameter exceeding two inches (2") and such wounds must show vigorous bark on all edges. Plants shall not be pruned prior to delivery.

G. Plants delivered by truck and plants requiring storage on site shall be properly wrapped and covered to prevent wind-drying and desiccation of branches, leaves or buds; plant balls should be firmly bound, unbroken, reasonably moist to indicate watering prior to delivery and during storage and tree trunks should be free from fresh scars and damage in handling. No trees with double-leaders or twin-heads shall be acceptable without the written approval of the Landscape Architect. The Contractor shall reject such plants at time of delivery by the nursery/supplier unless such plants were selected by the Landscape Architect as indicated by tags and seals. No plant material from cold storage will be accepted.

## 2.3 SOIL ADDITIVES

A. Commercial fertilizer, manufactured compost, peat, humus or other additives shall be used to counteract soil deficiencies as recommended by the soil analysis and as directed by the Landscape Architect.

1. Commercial fertilizer shall be a product complying with the State and United States Fertilizer Laws. Deliver to the site in the original unopened containers that shall bear the manufacturer's Certificate of Compliance covering analysis which shall be furnished to the Landscape Architect. At least 50% by weight of the Nitrogen content shall be derived from organic materials. Fertilizer shall contain not less than the percentages of weight of ingredients as follows or as recommended by the soil analysis:

| | Nitrogen | Phosphorus | Potash |
|---|---|---|---|
| For All Plants | 10% | 10% | 10% |

2. Fertilizer plan, including schedule and specific mix, must be submitted and approved by the Landscape Architect and the Owner’s Representative.

B. Ground dolomite limestone shall be an approved agricultural limestone containing not less than 85% of total calcium or magnesium carbonates. Limestone shall be ground to such fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve.

C. Humus shall be natural humus, reed peat or sedge peat. It shall be free from excessive amounts of zinc, low in wood content, free from hard lumps and in a shredded or granular form. According to the methods of testing of A.O.A.C., latest edition, the acidity range shall be approximately 5.5 pH to 7.6 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.

D. Peat moss shall be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. It shall be free from wood, decomposed colloidal residue and other foreign matter. It shall have an acidity range of 3.5 pH to 5.5 pH as determined in accordance with the methods of testing of A.O.A.C., latest edition. Its water absorbing ability shall be a minimum of 1,100% by weight on an oven-dry basis. Manufactured Compost of comparable qualities will be accepted in lieu of peat moss.

E. Superphosphate: Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 18% available phosphoric acid.

F. Water retention gel shall be used where appropriate. Mix with soil per manufacturer's directions.

## 2.4 BARK MULCH

A. Mulch shall be pine bark aged a minimum of six (6) months. The mulch shall be dark brown in color, free of chunks and pieces of wood thicker than one-quarter inch (1/4"). Mulch must be free of stringy material over three inches (3") in length and shall not contain, in the judgment of the Landscape Architect, an excess of fine particles. Mulch shall be 98% organic matter with the pH range of 3.5 to 4.5. Moisture content of packaged material shall not exceed 35%. Submit sample for the Landscape Architect's approval.

## 2.5 LAWN SEED MIX

A. Seed Mix shall be “Black Beauty Ultra” by Jonathan Green Co. of Reading, PA or Approved Equal low-fertilizer-requirement mix designed to minimize need for irrigation.

B. Grass seed for lawn areas shall be fresh, clean, dry, new crop seed, which meets the standard of the Federal Seed Act. Seed shall be mixed in proportion by weight and testing the minimum percentages of purity and germination. Seed shall be nursery grown seed composed of grasses grown from the following seed mixtures. Lawn Areas:

| Approx % by Wt. | Common Name of Grass | % Germination |
|---|---|---|
| 70 | Tall Fescues | 92 |
| 20 | Perennial Ryegrass | 92 |
| 10 | Kentucky Bluegrass | 85 |

C. Weed seed shall not exceed 0.1% by weight. Tall Fescue shall be a mix of “Tonto,” “Montana,” “Dorado,” or similar cultivar tall fescues. Bluegrass shall be “Madison,” “Deepblue,” “Prosperity,” or similar cultivar Kentucky bluegrass. Perennial Rye shall be “Frontier,” “Singular,” or similar cultivar Perennial Ryegrass.

2.6 SOD MIX

A. Sod shall be nursery grown sod composed of grasses grown from the following seed mixtures.

| % by Weight | Common Name of Grass |
|---|---|
| 70 | Tall Fescue |
| 20 | Kentucky Bluegrass |
| 10 | Perennial Ryegrass |

B. The sod shall be “Black Beauty Turf Type Fescue” grown by Sodco, Inc. of Slocum, Rhode Island, or other approved New England source; submit proposed sod specifications and source for approval.

C. Weed seed shall not exceed 0.1% by weight. Tall fescue shall be a mix of “Golconda”, “Montana”, “Dorado”, or similar cultivar tall fescues. Bluegrass shall be a mix of “Deepblue,” “Prosperity,” or similar cultivar Kentucky bluegrass. Perennial Rye shall be a mix of “Frontier,” “Singular,” or similar cultivar Perennial Ryegrass.

D. Sod shall be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the supplier’s standard width and length. Maximum allowable deviation from standard widths and length shall be 5%. Broken pads and torn or uneven ends will not be acceptable. Sod shall be at least one (1) year old from time of original seeding.

E. Sod shall be furnished and installed in either of the following dimensions, to be selected by the Contractor:

F. In rectangular sod strips measuring 12 inches or 16 inches in width and from 4 feet to 6 feet in length, stored in rolls with the grass top side inverted so that the topsoil is to the exterior.

G. Sod shall be harvested, delivered and installed within a period of 36 hours. Sod not transplanted within this period shall be inspected and approved by the Landscape Architect prior to its installation. Soil on sod pads shall be kept moist at all times.

H. If delivered in multiple shipments, the sods shall match one another in texture and consistency, in the judgment of the Landscape Architect.

2.7 MEADOW GRASS SEED MIX

A. Seed for wildflower areas shall be fresh, clean, dry, new crop seed, which meets the standard of the Federal Seed Act. Seed shall be mixed in proportion by weight and testing the minimum percentages of purity and germination. Seed shall be nursery grown seed composed of grasses grown from the following species:

| Botanical Name | Common Name |
|---|---|
| Schizachyrium scoparium | Little Bluestem |
| Festuca rubra | Red Fescue |
| Sorghastrum nutans | Indian Grass |
| Chamaecrista fasciculata | Partridge Pea |
| Elymus canadensis | Canada Wild Rye |
| Elymus virginicus | Virginia Wild Rye |
| Verbena hastata | Blue Vervain |

| | |
|---|---|
| Asclepias tuberosa | Butterfly Milkweed |
| Sisyrinchium angustifolium | Narrowleafed Blue Eyed Grass |
| Rudbeckia hirta | Black Eyed Susan |
| Aster lateriflorus | Starved/Calico Aster |
| Aster novae-angliae | New England Aster |
| Eupatorium fistulosum | Hollow Stem Joe Pye Weed |
| Liatris spicata | Spiked Gayfeather |
| Solidago juncea | Early Goldenrod |

B. Weed seed shall not exceed 0.5% by weight.

C. Seed mix shall be: New England Wildflower Seed Mix by New England Wetland Plants Inc. Amherst, MA (ph: 1.413.548.8000), or approved equal.

2.8 EROSION CONTROL MAT

A. Erosion Control Mat to be ECS-1B Single Net Straw Biodegradable Rolled Erosion Control Product by East Coast Erosion Control, 443 Bricker Road, Bernville, PA 19506 (ph1-800-582-4005) or approved equal to match specifications.

B. Erosion control mat to be made of uniformly distributed 100% agricultural straw and one organic jute net securely sewn together with biodegradable. Net opening to be .5"x.1".

C. The erosion control fabric to have a functional longevity of approximately 12 months. The erosion control fabric to meet Type 2.C specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

D. Erosion control fabric to come in 2 sizes. Standard to be 8' wide by 112.5' long, Mega to be 16' wide by 112.5' long.

2.9 INSECTICIDE

A. No insecticide shall be used except as specifically approved in writing by the Landscape Architect and the Owner’s Representative.

2.10 WATER

A. The Contractor shall be responsible to furnish his/her own supply of water to the site at no extra cost.

B. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

C. All new trees shall be furnished with a Portable Drip Irrigation System (PDIS) water bag, “Gator Bags” or Approved Equal. PDIS water bags shall be UV-treated, reinforced polyethylene bags with a nylon toothed zipper extending from top to bottom of bag, capable of holding a minimum of 20 gallons of water, constructed so that they can be attached to the trees, which provide water from a minimum of three drip points.

## PART 3 - EXECUTION

### 3.1 FINE GRADING AND LOAM

A. After the areas to be loamed have been brought to subgrade, and immediately prior to dumping and spreading the loam, the subgrade shall be loosened by disking or rototilling to a depth of at least three inches (3") to permit bonding of the loam to the subsoil. Remove all stones greater than two inches (2") and all debris or rubbish. Such material shall be removed from the site.

B. Loam shall be placed and spread over approved areas to a depth sufficiently greater than six inches (6") so that after natural settlement and light rolling, the completed work will conform to the lines, grading and elevations indicated. Supply additional loam, after testing and approval, as may be needed to give the specified depths and finished grades under the contract without additional cost to the Owner.

C. No subsoil or loam shall be handled in any way if it is in a wet, dry, or frozen condition.

D. Sufficient grade stakes shall be set for checking the finished grades. Grades shall be established which are accurate to one-tenth (1/10th) of a foot either way. Connect contours and spot elevations with an even slope.

E. After lime, fertilizer, and humus if required have been spread and incorporated into the bed, it shall be carefully prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter, and stones over one inch (1") in diameter shall be removed from the loam. Loam shall also be free of smaller stones in excessive quantities as determined by the Landscape Architect.

F. The whole surface shall then be rolled with a hand roller weighing not more than 100 lbs. per foot of width. During the rolling, all depressions caused by settlement or rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish to the required grade. The finish grades shall be inspected by the Landscape Architect for approval before final acceptance.

### 3.2 PLANTING

A. Furnishing and planting of any plant material includes the digging of the holes, provision of soil additives and loam, furnishing the plants of specified size with roots in the specified manner, the labor of planting and mulching and guying and staking where called for.

B. Season for Planting

1. Spring:
   a. Deciduous materials — March 21 through May 15
   b. Evergreen materials — April 15 through June 1
2. Fall:
   a. Deciduous materials — October 1 through December 1
   b. Evergreen materials — August 15 through October 15

C. Planting

1. Location for all plants and outlines for planting areas shall be staked on the ground by the Contractor for approval by the Landscape Architect before any plant pits or plant beds are dug.
2. At least fifteen (15) days prior to the expected planting date, the Contractor shall request that the Landscape Architect provide a representative to select and tag stock to be planted under this Section. The Contractor shall provide for the transportation and overnight accommodations, if necessary, for the Landscape Architect's representative during the period of time required to select and tag the plant material, at no extra cost to the Owner.
3. Plants shall be selected by the Landscape Architect at the place of growth for conformity to specification requirements as to quality, size, and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work. Cost of replacement shall be borne by the Contractor.
4. Plant pits shall be circular pits with sloping sides, except for plants specifically indicated to be planted in beds. Holes for trees and shrubs shall be at least two feet (2') greater in diameter than the ball, and shall be at least three (3) times the diameter of the ball for trees where space allows, and shall be of a depth that maintains the plant’s prior relation to finish grade. Bottom of pit shall be flat or deepest at the perimeter. If pit is dug deeper than required to maintain plant’s relation to finish grade, then soil replaced under root ball shall be compacted to prevent subsequent settling of tree or shrub. If soil at bottom of pit is impermeable or poorly drained, pit shall be dug one extra foot, backfilled with planting soil mix, and compacted before installing plant.
5. After excavation, fill pit twice successively with water. If water does not drain out of pit at a minimum of two inches per hour, provisions for drainage must be made. Contractor shall document drainage test results for review by Landscape Architect.
6. Topsoil, organic material and fertilizer mix for planting soil mix shall be thoroughly premixed in the proportions of one (1) part of organic material with four (4) parts of topsoil together with fertilizer at the rate determined by soil test. The organic material to be added shall be as directed by the Landscape Architect. One part of existing soil shall be mixed with two parts of planting soil mix for use in back filling around root ball. Maintain at all times during the planting operations one or more stockpiles of approved planting soil mix.
7. Install slow release fertilizer packets per manufacturers’ directions with each newly planted tree.
8. All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation and on the ground until the final planting. The plants shall be planted in the center of the holes and at the same depth as they previously grew (see a. below). Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structures. Remove burlap, rope, wires, etc., from the sides and tops of root balls. Do not pull burlap out from under root balls. Any girdling roots or badly damaged roots

must be cleanly pruned off. Planting soil mix shall be backfilled in layers of not more than six inches (6") and each layer watered sufficiently to settle before the next layer is put in place. Enough planting soil mix shall be used to bring the surface to finish grade when settled. A saucer shall be formed around each plant at a depth of six inches (6") for trees.

a. The Root Flare of each plant shall be located at the finish grade and visible. All planting depths shall be inspected by the Landscape Architect and the Owner's Representative, and if not at the proper depth shall be corrected at the Contractor's expense.

D. All plants shall be flooded with water twice within the first 24 hours of the time of planting and all plants during the maintenance period shall be watered at least twice each week. At each watering the soil around each plant shall be thoroughly saturated. If sufficient moisture is retained in the soil, as determined by the Landscape Architect, the required watering may be reduced. Trees will require a minimum of ten (10) gallons of water each.

E. Mulch material shall be placed over entire saucer areas of individual trees and over the entire area of planting beds to a depth of three inches (3") after settlement, not later than one (1) week after planting. No mulch shall be applied prior to the first watering of plant materials. Mulch shall be pulled back two inches (2") from tree trunks.

F. Portable Drip Irrigation System watering bags shall be installed as directed by the bag manufacturer, and shall be kept filled as necessary to maintain optimum health.

G. Antidesiccant shall be applied to all plants before digging at the nursery and/or as directed by the Landscape Architect once the plants have been delivered to the site.

H. Antidesiccant shall be applied to all evergreen plants in the late fall as directed by the Landscape Architect.

I. If planting is done after lawn preparation or installation proper protection of lawn areas shall be provided and any damage resulting from planting operations shall be repaired immediately at no cost to the Owner.

J. In the event that rock or underground construction work or obstructions are encountered in any plant pit or bed excavation work to be done under this Contract, alternate locations may be selected by the Landscape Architect.

K. Absolutely no debris may be left on the site. Excavated material shall be removed as directed by the Landscape Architect. Repair any damage to site or structures to restore them to their original condition as directed by the Landscape Architect, at no cost to the Owner.

## 3.3 SOIL ADDITIVES

A. Follow all recommendations for soil additives as determined by an approved Soil Testing Laboratory, and all manufacturers' instructions pertaining to additives.

## 3.4 BARK MULCH

A. Contractor shall install approved bark mulch material to the limits and depths shown on the Drawings and specified herein.

## 3.5 HYDROSEEDING

A. Limit of seeding shall be shown on the Drawings. All areas on the plan shall be loamed and seeded only after written approval of the finished grading or as directed by the Landscape Architect. All seeded areas are to be hydroseeded.

The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and be accepted practice in this locality. At his/her option and on his/her responsibility the Contractor may plant seed under unseasonable conditions without additional compensation, but subject to the Architect's approval as to time and methods.

B. Planting may be done between August 15 and October 15, or between April 15 and June 15.

C. Soil additives shall be spread and thoroughly incorporated into the later of loam and the upper 1 inch of the underlying subsoil by harrowing or other methods approved by the Architect. The following soil additives shall be incorporated:

1. Ground limestone as required by soil analysis to achieve a pH of 6.0 to 6.5.

2. Fertilizer as required by soil analysis.

3. Superphosphate at the rate of 20 lbs. Per 1,000 square feet.

4. Humus as required by soil analysis.

5. Compost at a rate of 1 part compost per 4 parts planting loam.

D. Seeding of lawns shall be done only by experienced workmen under the supervision of qualified foreman. Seeding shall consist of soil preparation, rolling, hydroseeding, weeding, fertilizing, watering and otherwise providing all labor and materials necessary to secure the establishment of acceptable turf.

E. The soil on which the seed is spread shall be reasonably moist and shall be watered, if directed by the Architect. The seeded areas shall be watered evenly and at a rate of 5 gallons per square yard, unless otherwise directed by the Architect.

F. Contractor shall place and maintain barriers (in a neat condition) around hydroseeded areas to keep people off during the first sixty (60) days.

G. The actual seeding of lawns shall be done only during periods within the season which are normal for such work as determined by weather conditions and by accepted practice in this locality, except as approved by the Architect.

H. The application of grass seed, fertilizer, limestone, and a suitable wood fiber or other mulch shall be accomplished in one operation for hydroseeding.

I. Hydroseeding shall be done by use of an approved spraying machine, which shall be operated only by personnel thoroughly familiar with this type of seeding operation.

J. Prior to starting work, Contractor shall furnish the Architect with a certified statement as to the number of pounds of materials to be used per 100 gallons of water and the number of square feet to be covered with the quantity of solution in the hydroseeder.

1. Materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water.

2. Solution shall be sprayed evenly over the area so that resulting deposits of all materials shall equal the required rates.

3. Spraying equipment shall be thoroughly cleaned and flushed prior to start of work and after every ten acres.

4. When inoculum is required, if the inoculum is left in the solution with fertilizer for longer than thirty minutes, a fresh charge of inoculum shall be added to the mixture.

## 3.6 MEADOW GRASS SEED MIX

A. Always apply on clean bare soil. Preparation of a clean weed free soil surface is necessary for optimal results. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Late Spring and early Summer seeding will benefit with a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering may be required. Fertilization is not required unless the soils are particularly infertile.

B. Best results are obtained with a Spring seeding. Late Fall and Winter dormant seeding require an increase in the seeding rate.

## 3.7 SODDING

A. Limit of sodding shall be shown on the Drawings. All areas on the plan shall be loamed and sodded only after written approval of the finished grading or as directed by the Landscape Architect.

B. Planting season for sod shall be from April 15 to June 1. The actual planting of sod shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and be accepted practice in this locality. At this option and on his responsibility the Contractor may plant sod under unseasonable conditions without additional compensation, but subject to the Landscape Architect's approval as to time and methods.

C. Soil additives shall be spread and thoroughly incorporated into the later of loam and the upper 1 inch of the underlying subsoil by harrowing or other methods approved by the Landscape Architect. The following soil additives shall be incorporated:

1. Ground limestone as required by soil analysis to achieve a pH of 6.0 to 6.5.

2. Fertilizer as required by soil analysis.

3. Superphosphate at the rate of 20 lbs. Per 1,000 square feet.

4. Humus as required by soil analysis.

D. Sodding of lawns shall be done only by experienced workmen under the supervision of qualified foreman. Sodding shall consist of soil preparation, sodding, rolling, pegging, weeding, fertilizing, watering and otherwise providing all labor and materials necessary to secure the establishment of acceptable turf.

E. The soil on which the sod is laid shall be reasonably moist and shall be watered, if directed by the Landscape Architect. The sod shall be laid smoothly, edge to edge, and where continuous or solid sodding is called for on the plans sod shall be laid with the longest dimension parallel to the contours. Sodding shall start at the base of slopes and progress upward in continuous parallel rows. Vertical joints between sods shall be staggered. Immediately after laying, so shall be pressed firmly into contact with the sod bed by tamping, rolling, or by other approved method – press firmly as to eliminate all air pockets, provide tree and even surfaces, ensure knitting and protect all exposed sod edges, but without displacement of the sod or deformation of the sod surfaces. The sodded areas shall be watered evenly and at a rate of 5 gallons per square yard, unless otherwise directed by the Landscape Architect.

## 3.8 EROSION CONTROL FABRIC

A. Install as shown in Drawings and per Manufacturer's instructions.

B. Erosion control mat should be secured by 11 gauge staples at a minimum size of 6" long and 1" crown. Staple pattern should reflect the layouts for the corresponding slope given by the manufacture.

## 3.9 MAINTENANCE AND PROTECTION OF PLANTS AND LAWN AREAS

A. Maintenance shall begin immediately after an area is planted or sodded and shall continue until final acceptance. The minimum maintenance period shall be ninety (90) calendar days after completion of all plant installations including lawn. Watering and mowing shall be done by the Contractor for the full 90 days. Final acceptance of the plant material cannot be made until the full 90 maintenance period has elapsed.

B. Maintenance shall include replacement of shrubs, mowing, watering, weeding, and fertilizing.

C. Watering of Lawn Areas:

1. First week: The Contractor shall provide all labor and arrange for all watering necessary for rooting of the plant materials. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantity to maintain moist soil to a depth of at least 4 inches. Watering shall not be done during the heat of the day to help prevent wilting.

2. Second and Subsequent weeks: The Contractor shall water the lawn and plantings as required to maintain adequate moisture, until final acceptance, in the upper 4 inches of soil.

3. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply one (1)

complete coverage to the lawn areas and plantings in an eight (8) hour period.

D. Watering of Tree Plantings:

1. Portable Drip Irrigation System watering bags shall be kept filled as needed to maintain optimal plant health. Bags shall be filled a minimum of once each week regardless of rain conditions. The contractor shall be responsible for ensuring that watering bags are kept full for one full growing season after installation.

E. Mowing:

1. The first mowing of lawn areas shall not be attempted until the lawn is firmly rooted and secure in place. Not more than 40% of the grass leaf shall be removed by initial or subsequent mowings. Grass height shall be maintained between 2 inches and 2-1/2 inches unless otherwise specified. Thereafter grass shall be maintained at 2 inches until acceptance.

F. Fertilizing:

1. A second application of fertilizer, as specified herein and as outlined in the fertilizing schedule to be submitted by the Contractor, shall be applied approximately 6 weeks after the sod has been installed as directed by the Landscape Architect. Fertilizer shall be applied at the rate of 10 pounds per 1,000 square feet or as otherwise approved as part of the fertilizing schedule.

END OF SECTION

331000 SITE DOMESTIC WATER DISTRIBUTION

A. Description: Furnish and install buried ductile iron pipe, valves, fittings, polyethylene services and appurtenances as shown on the drawings and as specified herein.

B. Functional Requirements:

1. Design Requirements:

a. Ductile Iron Pipe:

1) All ductile iron pipe shall conform to AWWA C151, Class 52.
2) All ductile iron pipe shall have a bituminous outside coating in accordance with AWWA C151.
3) All ductile iron pipe shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

b. Ductile Iron Fittings:

1) Ductile iron fittings shall conform to AWWA C110 or C153, Class 350.
2) All ductile iron fittings shall have a bituminous outside coating in accordance with AWWA C110.
3) All ductile iron fittings shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

. c. Joints:

1) Joints for pipe and fittings shall be restrained push-on or restrained mechanical joints conforming to AWWA C111. Gaskets shall be of SBR. Un-restrained joints may not be used.
2) Joints shall be suitable for 250 psi working pressure and be fabricated of heavy section ductile iron casting.
3) Bolts and nuts shall be low carbon and conforming to ASTM A307, Grade

. d. Solid Sleeves:

1) Solid sleeves shall be long body type, ductile iron with mechanical joints and retainer glands shall be of the solid type, long laying length.
2) Solid sleeves shall be cement mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.

e. Flexible Couplings: Flexible Couplings shall be cast iron with rubber gaskets.

f. Retainer Glands: Retainer glands shall be Ebba Iron Sales Inc. – Mega Lug or Ford Co. – 1400 Series.

g. Valves: Valves shall be resilient seated gate valves for buried service, and be manufactured in accordance with AWWA C509. Valves shall be provided with a minimum of two O-ring stem seals. Valves shall be epoxy coated, 8mm thick, interior and exterior.

. h. Valve Boxes and Covers: Valve Boxes and covers shall be cast iron, tar coated, two piece adjustable sliding type which include cast iron covers.

i. Water Services:

1) Corporation Cocks shall be ball valves, open left, with compression fittings.
2) Curb Stops shall be ball valves, open left, with compression fittings.
3) Curb stops shall have service boxes which shall be tar coated, cast iron, sliding type with inlaid covers. Shaft shall be 2 ½ inches diameter with extension rods.
4) Service pipe shall be high density polyethylene copper tube size for use with compression fittings. The pipe shall be polyethylene #4508, SDR-9 rates for 200 psi.
5) Compression fittings shall be used for joining polyethylene tubing.
6) Coupling shall be straight coupling, 3 part, both ends pack joints for polyethylene pipe with a split locking clamp with stainless steel screw.
7) Cut and remove all roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground in the area of construction, as indicated on the Contract Drawings as the limit of work.

END OF 331000

333000 SANITARY SEWERAGE PIPING

A. Description: Installation and testing of polyvinyl chloride (PVC) sewer pipe, fittings and appurtenances

B. Functional Requirements:

1. Design Requirements:

a. PVC solid wall gravity pipe and fittings shall be Type PSM, PVC SDR 35 and conform to ASTM 3034.
b. Pipe shall be furnished in standard laying lengths in accordance with ASTM 3034 and fittings shall be furnished in lengths of not more than 3 feet.
c. PVC pipe and fittings shall have bell and spigot push-on ends. The bell shall consist of an integral wall section with a solid cross-section elastomeric gasket securely locked in place to prevent displacement during assembly.

2. Testing:

a. All PVC pipe shall be field tested. Supply all labor, equipment, material, gauges, pumps, meter and incidentals for testing.
b. Gravity pipe shall be visibly inspected for leakage.

3. Cleaning:

a. Prior to final completion of the Work, thoroughly clean al new pipelines and remove all dirt, stones, pieces of wood or other materials.

END OF 33 000

334000 STORM DRAINAGE PIPING

A. Description: Installation of high density polyethylene (HDPE) pipe, fittings and appurtenances.

B. Functional Requirements:

1. Design Requirements:

   a. HDPE pipe resins shall be high molecular weight, high density polyethylene with a cell classification number of 345434C per ASTM D3350.
   b. HDPE pipe shall meet requirements of ASTM F714.
   c. Pipe shall be furnished in standard laying lengths not exceeding 25 feet.
   d. All high density polyethylene pipe and fittings shall be made from the same resin.

2. Pipe Identification: The following shall be continuously indent printed on the pipe and spaced at intervals not exceeding 5 feet:

   a. Name and/or trademark of the pipe manufacturer.
   b. Nominal pipe size.
   c. Dimension ratio.
   d. The letters PE followed by the polyethylene garde in accordance with ASTM D1248, followed by the hydrostatic design basis in 100's of psi, e.g. PE 3408.
   e. Manufacturing standard reference, e.g., ASTM F714.
   f. A production code from which the date and place of manufacture can be determined.

3. Testing:

   a. All HDPE pipe shall be field tested. Supply all labor, equipment, material, gauges, pumps, meter and incidentals required for testing. Pressure test each pipe upon completion of the pipe laying and backfilling operations.

4. Cleaning:

   a. Prior to final completion of the Work, thoroughly clean all new pipelines and remove all dirt, stones, pieces of wood or other materials.

END OF 334000

334200 SITE STORM WATER DRAINS

A. Description: Furnish, install and test precast concrete manholes, catch basins, stormwater pretreatment separator, frames and covers, frames and grates and appurtenances as shown on the drawings and as specified herein.

B. Functional Requirements:

1. Design Requirements:

a. General:

1) Cement shall conform to ASTM C150, Type II cement or equal.
2) Provide lifting lugs or holes in each precast section for proper handling.
3) Like items of material/equipment shall be end products of one manufacturer.
4) Precast sections shall be properly cured prior to shipping.

b. Precast Concrete Manhole Sections and Catch Basins: Precast concrete base sections, riser sections, transition top sections, flat slap tops and grade rings shall conform to ASTM C478 and meet the following requirements:

1) Design precast concrete base and flat slab for their own weight, weight of soil, and a live load equal to AASHTO H-20 truck loading applied at finish grade.
2) Bottom slab thickness shall equal the riser wall thickness or flat slab thickness, whichever is greater.
3) Construct precast concrete base as shown on the drawings.
4) Base, riser, and transition top sections shall have tongue and groove joints.
5) Top section shall be eccentric cone where cover over pipe exceeds 4-feet and as shown on the Drawings. Top section shall be flat slab where cover over pipe is 4-feet or less.
6) Provide integrally cast knock out panels in precast concrete manhole sections at locations, and with sizes shown on the drawings. Knock out panels shall have no steel reinforcing.

c. Stormwater Pretreatment Separator:

1) The stormwater pretreatment separator shall be approved by the Massachusetts Stormwater Technology Evaluation project (MASTEP).
2) Design Criteria: Performance objective of 80% TSS to recharge system at design flow.
3) The stormwater pretreatment separator shall be capable of containing spills of floatable substances such as oil and gasoline.

4) The manhole risers and frames and covers for the stormwater pretreatment separator shall be provided by the manufacturer.
5) Design precast concrete base and flat slab for their own weight, weight of soil, and a live load equal to AASHTO H-20 truck loading applied at finish grade.
6) The particle separator shall be easy to maintain.

d. Brick Masonry:

1) Bricks for channels and shelves shall conform to ASTM C32, grade SS.
2) Brick for raising frames to finished grade shall conform to ASTM C62.
3) Mortar shall be composed of 1 part Portland cement, 2 parts sand, and hydrated lime not to exceed ten-pounds to each bag of cements. Portland cement shall be ASTM C150, Type II; hydrated lime shall conform to ASTM C207.
4) Sand shall be washed, cleaned, screened, well graded with all particles passing a No. 4 sieve and conform to ASTN C33.

e. Frames and Covers and Frames and Grates:

1) Frames and covers and frames and grates shall be cast iron. Cast iron shall conform to ASTM A48, Class 30.
2) Frames and covers shall have a 24-inch diameter clear opening unless otherwise indicated on the drawings.
3) Frames and grate shall have a 24-inch square clear opening unless otherwise indicated on the drawings.

f. Jointing Precast Concrete Sections:

1) Seal tongue and groove joints of precast sections with either rubber O-ring gasket or preformed flexible joint sealant.
2) Completed joint shall withstand 15 psi internal water pressure without leakage or displacement of gasket or sealant.

g. Pipe Connections: Connect pipe to precast concrete structures as follows:

1) Flexible sleeve- integrally cast sleeve in precast section or install sleeve in a formed or cored opening.
2) Compression gasket – integrally cast compression gasket in precast concrete section.
3) At the discretion of the Engineer, grout in place using non-shrink and waterproof mortar.

h. Manhole Rungs: Manhole rungs shall be steel reinforced, copolymer polypropylene, 14-inch wide, M.A. Industries Inc. Type PS2-PF-SL, or equal.

i. Damp proofing: Sanitary precast structures shall have two coats of bituminous waterproofing applied to the exterior surfaces by brush or spray and in accordance with the manufacturer's recommendations. Damp proofing shall be Hydrocide 648 by Sonneborn Building Products; Dehydratine 4 by A. C. Horn Inc., RIW Marine Liquid by Toch Brothers or equal.

END OF 334200