WHITE PLAINS CITY SCHOOL DISTRICT

ADDITON AT WHITE PLAINS HIGH SCHOOL
SED Control No. 66-22-00-01-0-016-030

CONTRACT C- CIVIL AND SITE WORK
CONTRACT G – GENERAL CONSTRUCTION WORK
CONTRACT P – PLUMBING WORK
CONTRACT M – HEATING, VENTILATION, AND AIR CONDITIONING
CONTRACT E – ELECTRICAL WORK

WESTCHESTER COUNTY, NEW YORK

NOTE: *This clarification forms a part of the contract documents for the above project and must be acknowledged in the plans and specifications. Attach it to the inside front cover of each of the specifications.*

GENERAL CLARIFICATION TO Project:

1. Sign in sheet from the pre-bid walk through held on April 1st, 2024, has been attached.

2. All built in casework to be supplied and installed by GC. All loose furniture is shown for reference only and will be purchased by the district.

CLARIFICATION TO SPECIFICATIONS:

1. Remove specification section 055516 Stair Treads and Nosings and replace with specification section 055516 Stair Treads and Nosings. Part 1.02.B.2 updated to state section 033000 Cast-in-Place Concrete.

2. Specification section 057200 handrails and railings with cable railing components has been removed from the Table of Contents. Section not used.

3. Specification section 057300.11 Preassembled Aluminum Railing Systems - has been removed from the Table of Contents. Section not used.

4. Specification section 057310- has been removed from the Table of Contents. Section not used.

5. Specification section 072713 Air Barrier/Vapor Barriers has been removed from the Table of Contents. Section not used.

6. Specification section 072726 Fluid-Applied Air and Vapor Barriers has been removed from the Table of Contents. Section not used.

7. Specification section 078413 Penetration Firestopping was added to the specification book twice. Delete both sections and insert specification section 078413 Penetration Firestopping into specification book.

8. Specification section 081214 Arch-Trimless Door Frame System has been updated to show on the Table of Contents

9. Specification section 081700 Integrated Door Opening Assemblies to be inserted into specification book.

10. Specification section 095000 Acoustical Metal Ceilings has been removed from the Table of Contents. Section not used.

11. Specification section 095026- Suspended Wood Ceilings has been updated on Table of Contents to 095426 Suspended Wood Ceilings.

12. Specification section 098426.11 Acoustical Wall Panels, Ceiling Baffles and Canopy Components has been updated on Table of Contents to 098400 Acoustical Wall Panels, Ceiling Baffles and Canopy Components

13. Specification section 096716 Epoxy Fluid Applied Flooring has been removed from the Table of Contents. Section not used.

14. Specification section 096723 Resinous Flooring (Stonhard) added to table of contents, section to be inserted into specification book.

15. Specification section 098426.11 Acoustical Wall Panels (Decoustics) has been updated to show on the Table of Contents

16. Specification section 102219.17 Demountable Partitions have been updated on Table of Contents to 102219.16 Demountable Partitions.

17. Specification section 096599- Resilient Flooring for Dance Studio has been removed from the Table of Contents and specification book. Section not used.

18. Specification section 098430 Arch-Sound-Absorbing Wall and Ceiling Units has been added to the Table of Contents.

19. Specification section 123100 RIB-Manufactured Metal Casework has been removed from the Table of Contents and specification book. Section not used. Contractor to refer to specification section 123113 Stainless Steel Casework.

20. Specification section 123200 Manufactured Wood Casework has been removed from the Table of Contents. Section not used.

21. Specification section 124813.13 Recessed Entrance Floor Mats and Frames has been removed from the Table of Contents. Contractor to refer to specification section 124813.15 Arch-Entrance Floor Grids and Frames (Cs Gridline G6)

22. Remove specification section 142100 Machine Room-Less Traction Elevators and replace with specification section 142100 Machine Room-Less Traction Elevators Part 1.03B has been updated.

23. Specification section 220719 plumbing piping has been updated on Table of contents to 221100 plumbing piping.

24. Specification section 221000 plumbing piping insulation has been updated on table of contents to 220710 plumbing piping insulation.

25. Specification section 230993 sequence of operations to be inserted into specification book.

26. Division 31, 32, 33 specification sections to be inserted into specification book.

End of Addendum No. 2

X:\WPSD (White Plains Central School District) - 10991\WPSD 2203 - (HS Addition)\03-Bid\Addenda\arch\WPSD 2203 Addendum 2.docx

WHITE PLAINS CITY SCHOOL DISTRICT

HIGH SCHOOL ADDITION
SED CONTROL NO. 66-22-00-01-0-016-030

CONTRACT C - CIVIL AND SITE WORK
CONTRACT G - GENERAL CONSTRUCTION WORK
CONTRACT M - HEATING VENTILATION AND AIR CONDITIONING WORK
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FRONT END DOCUMENTS

SAMPLE AIA DOCUMENTS

TECHNICAL SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

DIVISION 2 – DEMOLITION

DIVISION 03 - CONCRETE

DIVISION 04 – MASONRY

DIVISION 05 – METALS

END OF TABLE OF CONTENTS

TRITON CONSTRUCTION

Owner/District:	White Plains City School District
	High School
Architect:	H2M architects + engineers
Meeting Type:	Phase 02 – High School Bid Walkthrough
Date:	Tuesday, April 1, 2025 11:00AM

MEETING ATTENDANCE SIGN-IN SHEET

	Name	Company	Telephone & Email
1.	ROBERT FIRNEIS	TRITON CONSTRUCTION	RFIRNEIS@TRITONCONSTRUCTION.NET 914 635 0913
2.	ATANAS MAKEV	UNIMAK, LLC.	201-206-9672 ATANAS.MAKEV@UNIMAKLLC.
3.	BOB BEE	H2M	646 9317721 rbee@h2m.com
4.	Fred Lalezarian	MPCC	914-636-0000 Fred@MPCCcorp.com
5.	Manuel Lantigua	MPCC corp	347-722-3461 estimating@mpccorp.com
6.	RoboLODES		
7.	TONY MORATO	PIEROTTI	TONYM@PIEROTTI CORP.COM
8.	ROBERT JONES	GLOBAL ELEC.	
9.	Steve Kunzweber	Global Electric	office@Globalelectrical contracting.com
10.	Zain Khan	Dynamic GC Corp	917-755-5012 Zain@Dynamicgcc.com
11.	Jason Chu	Dynamic GC Corp	Jasonchu19@gmail.com 914-391-2148
12.	JASON A.	HEALY ELEC.	
13.	RYAN TANSEY	PAV-LAK	631-434-7300 RTANSEY@PAV-LAK.com
14.	WILMER LEMA	PRO CON GROUP	718-966-8080 LEMA62@GMAIL.COM
15.	Collin McTague	ENL Mechanical	732 456 5005 CMR@enlmechanical.com

TRITON CONSTRUCTION

Owner/District:	Hendrick Hudson School District	**Project #:**	Triton # 1424
	Phase 1		
Architect:	KSQ Design		
Meeting Type:	Phase 01 –Bid Walkthrough @ HHHS, BMMS, FGLES, BVES, FWES		
Date:	Tuesday, February 11, 2025 at 1:00PM		

MEETING ATTENDANCE SIGN-IN SHEET

	Name	Company	Telephone & Email
16.	Robert Golinello	ELQ	914 916 2794 Rgolinello@ELQIndustries.com
17.	Daniel Ferreira	Maple Leaf Assoc.	(845) 526-2024 dferreira@mapleleafassociates.com
18.	Steve Dinis	Aventura Const.	631-924-0660 SDINIS@AVENTURACORP.COM
19.	Mark Benenaty	Parkview Plumbing	914-403-7158 Mark.Benenaty@Parkviewplumbing.com
20.	Paul Fazio	Sun General Con.	718-464-4600 Sunconstruction2011@gmail.com
21.	Ernesto Graciano	ER Electric	914 469 0018 ernesto@erelectriccorp.com
22.	Anthony Malfitano	Bertussi	
23.	Marko Grbac	Jablko Const.	914-602-8221 marko@jablko.com
24.	Joe Pickarski	Jablko	914-255-4909 joe.p@jablko.com
25.	Roniece Bridge	H2M	rbridge@h2m.com
26.	Fred Camilli	Triton	
27.	Xavier Hernandez-Delgado	WPCSD	914-539-1653 W
28.			
29.			
30.			

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Steel Angles and Miscellaneous Metal supports.
   2. Elevator machine beams, hoist beams, and divider beams.
   3. Steel shapes for supporting elevator door sills.
   4. Steel Ladders.
   5. Loose bearing, Lintels and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section include the following:
   1. Loose steel lintels.
   2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.03 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.04 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Metal nosings.
   2. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
   1. Steel Angles and Miscellaneous Metal supports.
   2. Elevator machine beams, hoist beams, and divider beams.
   3. Steel shapes for supporting elevator door sills.
   4. Steel Ladders.
   5. Loose steel lintels.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Welding certificates.

1.06 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.07 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on the shop drawings.
   1. Established dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond with established dimensions.

PART 2 - PRODUCTS

2.01 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Abrasive-Surface Floor Plate: Steel plate with abrasive material metallically bonded to steel.
   1. Products Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. IKG Industries, a division of Harsco Corporation; Mebac
      b. Or approved equal.

D. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
   1. Size of Channels: or as indicated.
   2. Material: Galvanized steel, ASTM A653/A653M, commercial steel, Type B, with G90 coating; 0.108-inch nominal thickness.

E. Aluminum Extrusions: ASTM B221, Alloy 6063-T5 or 6.

2.02 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners.
   1. Provide stainless-steel fasteners for fastening aluminum.

B. Steel Bolts and Nuts: Regular hexagon-head bolts,ASTM A307 , Grade A; with hex nuts, ASTM A653/A653M; and, where indicated, flat washers.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM F3125/F3125M , Type 3; with hex nuts, ASTM A563, Grade C3; and, where indicated, flat washers.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Plain Washers: Round, ASME B18.22.1.

F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

G. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

H. Post-Installed Anchors: Torque-controlled expansion anchors.
1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

2.03 MISCELLANEOUS MATERIALS

A. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.

B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

D. Non-shrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, non-gaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Concrete: Comply with requirements in Section 033000 - CAST-IN-PLACE CONCRETE for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 4000 psi.

2.04 FABRICATION, GENERAL

A. Shop Assembly: Pre-assemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form exposed work with accurate angles and surfaces and straight edges.

D. Weld corners and seams continuously to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

F. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.05 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
   1. Fabricate units from slotted channel framing where indicated.

C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
   1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
   2. Unless otherwise indicated, provide 1/2-inch baseplates with four 5/8-inch anchor bolts and 1/4-inch top plates.

D. Galvanize miscellaneous framing and supports where indicated.

2.06 STEEL LADDERS

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish. Ladders shall meet OSHA 1910.23 - Ladders and OSHA 1917.118 - Fixed Ladders.
   1. Side Rails: 3/8 x 2 inches (9 x 50 mm) members spaced at 20 inches (500 mm). with eased edges and radius top extensions. Provide rails extending 42 inches above top rung or walk over platform and spaced 24 inches inside (clear) width. Provide horizontal rail extensions and walk-over platforms as indicated on the drawings.
   2. Rungs: one inch (25 mm) diameter solid round bar with non-slip tread aluminum oxide surfaces, spaced 12 inches (300 mm) on center.
   3. Fit rungs into center of side rails, plug weld and grind smooth on outer rail faces.
   4. Space rungs 7 inches (175 mm) from wall surface to centerline of rungs. Pre-drill brackets for 3/8 diameter expansion type anchors unless indicated otherwise on the drawings.
   5. Provide platforms as indicated fabricated from welded or pressure-locked steel bar grating supported by steel angles. Limit openings in gratings to 3/4" in the least dimension.
   6. Support each ladder rail at the top and bottom and not more than 60 inches on center with welded steel offset brackets.
   7. Hot Dip Galvanize and Powder-coat Grey prime exterior ladders after fabrication for finish field painting as per Division 09.
   8. Prime interior ladders including brackets and fasteners for finish painting as per Division 09.

B. Flexible Cable Ladder Safety System: in compliance with ANSI Z359.1 & OSHA 1926.502(d).
   1. 3M DBI-SALA "Lad-Saf" galvanized and stainless steel system complete with the following:
      a. Standard galvanized, shock absorbing top bracket (6116280) with built-in energy absorber to attach to at least three ladder rungs.
      b. Standard galvanized bottom bracket (6100090) attached to at least two rungs.
      c. Non-metallic cable guide (6100400) with mounting hardware (every 25 feet).
      d. 3/8 inch diameter, 1 x 7 type galvanized cable.
      e. Lad-Saf X3 detachable cable sleeve (6160054) (follows climber in each direction and which will immediately lock onto the cable in the event of a fall).
      f. Integrated tension indicator.
      g. Intermediate cable guides to prevent cable wear against the ladder while allowing bypass without disconnecting.
      h. Provide custom components and accessories as required for a complete installation.

2.07 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Hot Dip Galvanize plates (2.0 oz. / sq. ft.).

2.08 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Galvanize loose steel lintels located in exterior walls - Hot Dip Galvanize (2.0 oz. / s.f.).

2.09 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.10 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M and ASTM A653/A653M for other steel and iron products.
   1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
   1. Shop prime with universal shop primer primers specified in Section 099113 - EXTERIOR PAINTING unless indicated otherwise.

PART 3 - EXECUTION

3.01 EXAMINATION

A. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.02 INSTALLATION, GENERAL

A. Install all factory-fabricated items in accordance with the manufacturer's specifications and recommendations.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

D. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, and other connectors.

F. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

G. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
   1. Cast Aluminum: Heavy coat of bituminous paint.

3.03 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for securely to, and rigidly brace from, building structure.

C. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.

3.04 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with non-shrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.05 PROTECTION

A. Protect installed products until completion of project.

3.06 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Agreement, including General and Supplementary Conditions, and Division 01 of the Project Manual apply to work of this Section.

1.02 SUMMARY

A. The work of this Section includes, but is not limited to, the following:
   1. Extruded aluminum safety treads with integral nosings.
   2. Extruded aluminum safety nosings.
   3. Photoluminescent aluminum safety treads with integral nosings.
   4. Photoluminescent aluminum safety nosings.
   5. Renovation safety treads and nosings.

B. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
   1. Section 033000 – Cast-In-Place Concrete
   2. Section 096513 – Resilient Base and Accessories for interior rubber stair treads with integral nosings.

1.03 STANDARDS AND REFERENCES (LATEST EDITION)

A. Americans with Disabilities Act (ADA).

B. ASTM International (ASTM):
   1. ASTM B30 – “Standard Specification for Copper Alloys in Ingot Form”.
   2. ASTM B221 – “Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes”.
   3. ASTM D635 – “Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position”.
   4. ASTM D3648 – “Standard Practices for the Measurement of Radioactivity”.
   5. ASTM D4828 – “Standard Test Methods for Practical Washability of Organic Coatings”.

C. International Standards Organization (ISO): ISO 17398 – Safety colors and safety signs – Classification, performance and durability of safety signs.

D. SMP 800C: Toxic gas sampling and analytical procedures.

E. Military Specification: Mil-D-17951E; Deck Covering, Lightweight, Nonslip, Abrasive Particle Coated Fabric, Film, or Composite and Sealing Compound.

F. California Code of Regulations (CCR): California Title 24; Code for the Visually Impaired.

G. New York City Building Code Reference Standards: RS 6-1- Photoluminescent exit path markings.

1.04 SUBMITTALS

A. Submit pursuant to Section 013300 – Submittal Procedures.

B. Submit pursuant to Section 016000 – Product Requirements.

C. Product Data: Manufacturer’s data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Cleaning and maintenance instructions.

D. Shop Drawings: Provide shop drawings indicating details of construction and installation.

E. Selection Samples: Submit two sets of samples showing available colors, patterns, textures, and finishes.

F. Verification Samples: For each product specified, two samples approximately 3 inches long, representing actual materials.

1.05 QUALITY ASSURANCE

A. Manufacturer: Obtain stair nosing assemblies through one source from an approved Manufacturer.
1. Manufacturer shall be ISO 9001 Certified or shall be an Approved Manufacturer for an ISO Certified Supplier.
a. ISO 9001:2000 Certified Manufacturer shall have documented management and control of the processes that influence the quality of its products.
b. Approved Manufacturer shall be approved by the Approved Supplier and shall have documented specifications that control their processes and influence the quality of its customer service.
2. Manufacturer shall have a minimum of ten (10) years of experience in the fabrication of stair nosing systems.

B. Installer: Firm with not less than three (3) years of successful experience in the installation of systems similar to those required by this project and acceptable to the manufacturer of the system.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials and products in strict compliance with manufacturer’s instructions and recommendations and industry standards. Protect from damage.

B. Store products in manufacturer’s labeled packaging until ready for installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Balco, Inc., PO Box 17249, 2626 S. Sheridan, Wichita, KS 67217; Phone 800-767-0082.

B. Wooster Products, Inc., 1000 Spruce St., PO Box 6005; Wooster, OH 44691; Phone 800-321-4936; Basis of Specification.

C. Architect Approved Equivalent.

2.02 EXTRUDED ALUMINUM SAFETY TREADS AND NOSINGS

A. Type: 231 BF Supergrit® 3” wide, ¼” thickness, safety nosings for exterior stair treads.

B. Nosing base shall be type 6063-T5 extruded aluminum.

C. Anti-slip filler shall contain not less than 65% virgin grain Aluminum Oxide (AL2O3) abrasive.

D. Nosings shall have passed Fire Resistance Test (Federal Test Method Std. No. 501a, Method 6411).

E. Nosings shall terminate not more than 4” from ends of steps for poured concrete stairs.

F. Color shall extend uniformly throughout the filler. Color as selected by Architect from manufacturer’s standard colors.

G. Provide protective tape. Protective tape should be removed as soon as possible once installed.

H. Nosings shall finish flush with the top of the traffic surface.

I. Anchoring Hardware: Provide manufacturer’s recommended anchoring hardware to achieve best results for substrate and application.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer’s recommended installation tolerances and conditions.

B. Do no proceed with installation until substrates have been properly prepared and deviations from manufacturer’s recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Commencement of installation constitutes acceptance of conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer’s written instructions and recommendations, including but not limited to the following.
   1. Schedule pours so as to install the metal safety nosings quickly before the initial set of the concrete occurs.
   2. Puddle the concrete and tamp safety nosing to insure proper concrete formation around the anchors.
   3. Remove protective tape upon completion of installation.
   4. Close area after pour; permit no use for 48 hours.

3.03 CLEANING AND PROTECTION

A. Cleaning: Clean treads and nosings as recommended by manufacturer. Remove scuff and heel marks prior to Substantial Completion.

B. Protection: Protect installed work from damage due to subsequent construction activity on the site including the application of sealer to the concrete stairs.

END OF SECTION

PART 1 - GENERAL

1.01 **SECTION INCLUDES**

A. Provide through penetration firestopping. The work of this section shall include, but not be limited to, the following:
   1. Provide firestopping at all openings in floors and fire rated walls and partitions to prevent the passage of fire, smoke or toxic gases and to maintain required fire ratings.
   2. Provide firestopping at all electrical, plumbing and electrical duct and pipe penetrations in floors, and fire-rated walls and partitions, to prevent the passage of fire, smoke or toxic gases.

1.02 **QUALITY ASSURANCE**

A. Qualifications: The work of this section shall be performed by a qualified and experienced installer, acceptable to the Architect/Engineer. The term "installer", as used herein shall mean a firm of established reputation; which has been trained by the manufacturer in the proper installation of fire safing material and which is regularly engaged in, and maintains a regular force of workers skilled in the installation of fire safing material of the type specified.

1.03 **REFERENCES**

A. Codes and Regulations: Comply with applicable regulations of governmental authorities having jurisdiction.

B. ASTM E119, Method for Fire Tests of Building Construction and Materials.

C. ASTM E814, Fire Tests of Through Penetration.

D. U.L. 1479, Standards for Fire Tests of Through Penetration Firestops.

E. Factory Mutual Systems.

1.04 **SUBMITTALS**

A. Shop Drawings: Shop drawings shall indicate the locations and types of the various fire safing material to be used throughout the building, and material and methods of installation of damming for the various floor, wall and ceiling construction. Details of damming shall be large scale and shall indicate material and methods of installation.

B. Product Data: Submit manufacturer's technical data and installation instructions.

C. Test Reports: Submit copies of test reports, by an independent testing laboratory, indicating that the fire safing material complies with the specified requirements.

1.05 **FIELD QUALITY CONTROL**

A. Section 014500 - Quality Control: field inspection and testing.

B. Tests for thickness and density of applied material will be performed by an independent testing agency. Where test results are unsatisfactory in sample areas, additional tests in other areas may be made. Such further testing, if required, shall be by the same testing agency but shall be paid for by the installer.

C. Independent Testing Agency will:

1. Inspect the installed firestopping after application and curing for integrity, prior to its concealment.
2. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings.
3. Re-inspect the installed firestopping for integrity of fire protection, after installation of subsequent work.
4. Provide written certification to the Architect, indicating installation meets or exceeds requirements of contract documents.

1.06 **WARRANTY**

A. Provide standard manufacturer's warranty on material composition and resistance to breakdown.

PART 2 - PRODUCTS

2.01 **FIRE RESISTANT SILICONE FOAM**

A. Acceptable materials are DOW CORNING Silicone RTV Foam, Chase-Foam CTCPR-855 by CHASE TECHNOLOGY CORP., Pensil RTV 851 by GENERAL ELECTRIC, or approved equal.

B. Foam sealant shall conform to the required fire rating in accordance with the requirements of ASTM E119, with a flamespread rating of 15 in accordance with ASTM E84. Foam sealant shall also conform to UL Standard 1479: "Standards for Fire Tests of Through Penetration Firestops".

C. The foam sealant shall provide a fire resistance equal to the construction into which it is installed; in accordance with "Through Penetration Firestop Systems (XHEZ)" in the Underwriters Laboratories "Building Materials Directory".

D. Dams: Provide dams as recommended by the manufacturer, as required for proper installation and for required fire rating.

2.02 **MINERAL FIBER FIRE SAFING INSULATION**

A. Provide insulation as manufactured by USG INTERIORS, INC. Product "Thermafiber Safing", CAFCO INDUSTRIES LTD., FIBREX INC. or approved equal. Density shall be 4 pcf with thickness to suit condition.

B. Provide 20 gauge minimum metal plate where required for fire safing support to comply with fire ratings.

C. Do not use fibrous safing insulation unless it is in conjunction with a compatible smoke seal as specified herein.

2.03 **MINERAL WOOL**

A. Loose mineral wool, rated noncombustible when tested according to ASTM E136, free of asbestos and glass fiber, and suitable for stuffing into metal deck flutes to an in place density of 6 to 12 pcf.

2.04 **FIRESTOPPING SEALANT**

A. Provide a silicone firestop sealant classified for both flame and temperature ratings under ASTM E814.

B. Acceptable materials are USG INTERIORS "Smoke Seal Compound", DOW CORNING "Firestop Sealant", BIO FIRESHIELD "Biotherm", 3M "Fire-Barrier Caulk", GENERAL ELECTRIC "RTV 7403" or approved equal.

2.05 **FIRESTOPPING MORTAR**

A. Provide Portland cement/fly ash mortar with an air dried density of 50 to 55 pounds per cu.ft. Mortar shall be classified for both flame and temperature ratings under ASTM E814.

B. Acceptable materials are BIO FIRESHIELD "Novasit K-10" or approved equal.

2.06 **PREFORMED PIPE SEALS**

A. Provide preformed intumescent collars classified for both flame and temperature under ASTM E814.

B. Acceptable materials are BIO FIRESHIELD "Firestop Collars", 3M "Wrap/Strip FS 195" or approved equal.

2.07 **ACCESSORIES**

A. Provide anchorage assemblies complying with U.L. designs and other components and accessories as needed.

PART 3 - EXECUTION

3.01 **DELIVERY AND STORAGE**

A. Deliver material and products in unopened packages and containers, clearly indicating name of manufacturer and U.L. labeling. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage. Protect material from freezing or overheating in accordance with manufacturer's instructions.

3.02 **INSPECTION**

A. Examine all surfaces to which the firestopping materials are to be applied, and notify the Architect/Engineer in writing of any conditions detrimental to the proper and expeditious installation of the work. Starting of work within an area shall be construed as acceptance of the conditions of that area.

B. Thoroughly clean all surfaces to receive firestopping material to eliminate mill scale, dirt, grime, oil, grease, dust, loose rust or paint, and all other foreign material.

C. Cleaning shall be accomplished just prior to application of firestopping material.

3.03 **INSTALLATION (GENERAL)**

A. Material and equipment shall be as approved by the manufacturer. Application procedures shall be in strict accordance with the manufacturer's directions and specifications. Only experienced, skilled mechanics approved by the material manufacturer shall be allowed to place the material.

B. Provide firestopping material at thicknesses as required to provide indicated ratings. Where not otherwise indicated, comply with U.L. standard designs. In multiple layer work, offset joints by at least 6 inches.

C. Anchor firestopping using manufacturer's recommended system and in compliance with U.L. standard designs.

D. Install firestopping without gaps and voids of any kind. Do not use damaged materials. Remove and replace nonfitting or disturbed work.

3.04 **MINERAL SAFING INSULATION**

A. Use mineral safing insulation at top of fire-rated partitions at underside of metal deck to provide complete fire-rated seal.

B. Mineral safing insulation must be used in conjunction with a sealant or foam firestop to ensure a continuous smoke seal.

3.05 **FIRESTOPPING SEALANT**

A. Use firestopping sealant at narrow joints at fire-rated floor and wall penetrations, and at penetrations subject to vibration or movement. Typical penetrations requiring sealant are plumbing and HVAC piping, electric conduit and ductwork.

B. Where openings are large enough, use mineral safing insulation in thicknesses required to dam the joint, and apply 1/2 inch minimum depth of sealant, or as required to achieve the rated assembly.

3.06 **FOAM-IN-PLACE FIRESTOPPING**

A. Apply foam-in-place firestopping material in depths required to meet the fire ratings indicated or required by U.L. standards. Provide clips or other approved means to contain the foam-in-place material which will enable the foam to solidly fill the areas intended. Mixing and application shall be in strict accordance with the manufacturer's written instructions.

B. Foam firestopping may be used in lieu of sealant or mortar material at the Contractor's option, provided details conform to manufacturer's recommendations for maintaining the integrity of the assembly in question.

3.07 **FIRESTOPPING MORTAR**

A. Mortar may be used to firestop all large, nonmoving openings in fire-rated assemblies, including multiple openings in floor slabs.

B. Mix mortar with clean water in accordance with the manufacturer's printed instructions. Wet all surfaces with water prior to application of mortar. Apply by hand or pump and vibrate in penetrations to prevent voids from forming.

C. Do not apply mortar if ambient or substrate temperature is below 35°F during the 24 hour period before application.

3.08 **PREFORMED PIPE SEALS**

A. Use preformed pipe seals for firestopping nonmetallic pipes or conduit penetrating rated assemblies. Preformed collars may be surface mounted or embedded in firestop mortar as space permits to seal PVC or ABS pipe penetrations. Size selection and installation shall be in strict accordance with manufacturer's written instructions.

3.09 FIELD QUALITY CONTROL

A. Coordinate installation of firestopping work with other work to minimize cutting and removal of installed firestopping. As work of other trades is completed, review firestopping work and repair or replace work which has been damaged or removed. Inspections will be performed to verify compliance with requirements.

3.10 CLEANING AND PROTECTION

A. Upon completion of the work, remove all unused materials from the site. Clean floors, walls and other adjacent surfaces that are stained, marred or otherwise damaged by this work. Leave all work and the adjacent areas in a clean condition.

B. Protect all completed work from damage, by methods recommended by the manufacturer of installed material.

3.11 SYSTEMS AND APPLICATION SCHEDULE

	CONSTRUCTION CONDITION	UL DESIGNATION
B.	Metal Pipe or Conduit	220, 221, 223
	1. Through Round Opening	316, 400, 425
C.	Insulated Metal Pipe	301, 310, 402, 403
	1. Through Round Opening	
D.	Metal Pipes or Conduits	399
	1. Through Large Openings	
E.	Cables Through Opening	222, 224, 307, 425
F.	Nonmetallic (Plastic) Pipe	300
	1. or Conduit through Opening	
G.	Metal Pipe or Conduit	425
	1. Through Gypsum Board Wall	
H.	Nonmetallic (Plastic) Pipe	226, 227, 228, 312
	1. or Conduit Through Gypsum	
	2. Board Wall	
I.	Cables Through Gypsum	425
	1. Board Wall	
J.	Mixed Penetrating Items	218, 219
K.	1. Ductwork Insulated	301
	1. Through Gypsum Board Wall in	227, 313
	2. Sleeve Opening	
L.	1. Ductwork	218, 219
	1. 2 Hr Gypsum Wall	312

3.12 PROVIDE ADDITIONAL UL DESIGNATION AS REQUIRED TO ACHIEVE FIRESTOPPING RATINGS EQUAL TO OR GREATER THAN ASSEMBLY PENETRATION.

END OF SECTION

PART I – GENERAL

1.01 SUMMARY

A. SECTION INCLUDES
   1. Work in this section includes the provision of integrated door opening assemblies including metal frame, integrated doors, and associated finish hardware, unless specified elsewhere. Smoke Seals shall be included in related work areas, unless specifically listed in this section.

B. RELATED DOCUMENTS
   1. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.

1.02 REFERENCES

A. ANSI/NAAMM-HMMA-841–Tolerances & Clearances for Commercial Hollow Metal Doors ANSI A156.1 – Butts and Hinges

B. ANSI A156.2 – Bored Locks and Latches

C. ANSI A156.3 – Exit Devices

D. ANSI A156.4 – Door Controls – Door Closers

E. ANSI A156.5 – Auxiliary Locks and Associated Products

F. ANSI A156.6 – Architectural Door Trim

G. ANSI A156.7 – Template Hinge Dimensions

H. ANSI A156.8 – Door Controls – Overhead Holders

I. ANSI A156.15 – Closer Holder Release Devices

J. ANSI A156.16 – Auxiliary Hardware

K. ANSI A156.18 – Material and Finishes

L. ANSI A156.26 – Continuous Hinges

M. ANSI A156.32 – Integrated Door Opening Assemblies

N. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

O. ANSI A250.4 - American National Standard Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings; 2011.

P. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.

Q. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

R. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

S. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

T. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

U. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

W. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

X. UL 305 - Standard for Panic Hardware; Current Edition, Including All Revisions.

Y. SDI-105 – Recommended Erection Instructions for Steel Frames

Z. SDI-107 – Hardware on Steel Doors (reinforcement application)

1.03 SUBMITTALS

A. Submit for information: Manufacturer's technical product data / catalog cut sheets. Clearly marked for each component item, including installation details, material descriptions, dimensions of individual components and profiles and finishes.
   1. Submit copies of schedule in accordance with Division 1, General Requirements.

B. Submit for approval: Door schedule organized into headings, grouping doors to receive same hardware items, indicating quantity and complete designations of every item required for each door opening.
   1. The schedule shall include:
   2. A list of abbreviations used in the schedule.
   3. Listing of each door in numerical order according to door numbers in the door schedule denoting: Locations, configurations (single, pair, etc.), door type (elevation, glazing, etc.), door and frame sizes, door and frame materials, handing, frame profile, anchor details and fire rating.
   4. Type, style, model number, function, size, hand and finish of each door hardware item.
   5. Manufacturer of each item.
   6. Fastenings and other pertinent information.

C. SHOP DRAWINGS
   1. Submit shop drawings with proposed integrated door opening assembly system, product and hardware options. Include anchors, hardware and other components not included in manufacturer's standard data for a complete and working installation.

D. Submit for approval: electrified hardware details, identified by door number, and detailed specifically for each type and function of electrified door opening.
   1. Sequence of operation
   2. Elevation
   3. Point-to-point wiring diagram for field installed wiring

E. OPERATIONS AND MAINTENANCE MANUALS
   1. Upon completion of construction and building turnover, furnish two (2) complete operation and maintenance manuals to the owner.

F. LEED Building submittal requirements

1.04 QUALITY ASSURANCE

A. Qualifications
   1. Integrated Door Assembly personnel to have to no less than 5 years of experience in the provision of Integrated Door Assemblies and related products for projects of similar size and complexity to projects of this type.

B. Supplier / Installer of Integrated Door Assemblies shall be a factory authorized and trained distributor in the supply of integrated door assemblies on projects of similar size, complexity and type to this project.

C. Substitutions
   1. All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 01, General Requirements. Those manufacturers whose products are deemed acceptable for this project are listed and approved in this section. Deviations are not permitted unless required for the purpose of providing proper operational function due to special circumstances. These will be approved in advance by the architect.

D. WARRANTY
   1. The complete integrated opening assembly (doors, frames and locking hardware) except as noted below shall be warranted to be free of defect in material or workmanship under normal use for a period of Five (5) years from date of first shipment. The manufacturer, at its sole option, will repair or replace the product or parts thereof found to be defective in material or workmanship per the details contained in the warranty certificate. Consult full, written warranty for details.
      a. Doors finished in Surfacequest© Architectural Fusions: Three (3) years from date of first shipment
      b. Continuous Hinges: Ten (10) years from date of first shipment
      c. Door closers: Ten (10) years from date of first shipment
      d. All electrical functions: Three (3) years from date of first shipment

1.05 REGULATORY REQUIREMENTS

A. Fire Rated Door Assemblies: Provide integrated door assemblies complying with all applicable requirements of the most current versions of NFPA 80 and UL 10C listed and labeled by a Nationally Recognized Independent Testing Laboratory.
   1. Provide 450 degree temperature rise doors at openings as required by building code.

B. Comply with all applicable accessibility guidelines as set forth in Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

C. Latching and locking doors that are hand activated and are in a path of travel shall be operated with a single effort by lever, panic bars, push pads or other hardware designed to provide passage without requiring the ability to grasp the opening hardware and from the egress side shall not require the use of a key, tool or special knowledge for operation.

1.06 DELIVERY, STORAGE AND HANDLING

A. Each Door shall be properly marked to be readily identifiable with the approved door schedule.

B. Manufacturer’s printed installation instructions, fasteners and special tools shall be included.

C. Deliver pre-finished doors with protective wrappings.

D. Store off ground, under cover protected from weather and construction activities.

1.07 COORDINATION

A. Electrical System Rough-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system, detection devices, access control system and security system as applicable.

B. Pre-installation conference: Arrange a conference at the job site to coordinate door, frame, hardware and electronic security system installation.

1.08 MAINTENANCE

A. Furnish a complete set of specialized tools and maintenance instructions as needed.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Only manufacturers of integrated door systems as listed below shall be accepted. Obtain all products from a single manufacturer.
   1. Specified Manufacturer: Syntégra (SYN)
   2. Substitutions: See Section 012500 - PRODUCT SUBSTITUTION PROCEDURES
   3. Hardware supplied with integrated door system:
      a. Hinges
      b. Locking hardware
      c. Door closers
      d. Magnetic holder/releases
      e. Protective plates
      f. Gasketing
      g. Lite kits

2.02 MATERIALS AND FABRICATION

A. Requirements for grade, materials, size and other distinctive qualities of each type of door hardware are indicated herein.

B. Requirements for design, function, finish and other distinctive qualities of each type of door hardware at specific openings are indicated in the door hardware sets at the end of part 3.

C. Unless modified by Contract Documents, construct integrated hollow metal door opening assemblies in accordance with manufacturer’s published specifications and applicable code Requirements.

D. Factory assembled with continuous hinges and all reinforcements, locksets, exit devices. Closers, kickplates, lite kits, glazing, mop plates and armor plates. Assembly to include integral adjustable door edge.

2.03 FASTENERS

A. Provide Phillips flat-head screws with finished heads to match surface of door hardware as needed.

B. Combination machine screws and expansion shields shall be used for attaching items to concrete or masonry.

C. Fasteners exposed to the weather in the finished work shall be of brass, bronze, stainless steel or adequately protected by applied finish.

2.04 DOOR FRAMES

A. Conform to ANSI/SDI A250.8 for steel door frames. Fire labeled frames shall comply with NFPA 80.

B. Frames shall have mitered corners continuously welded and ground smooth on frame faces; shall be provided with a temporary spreader bar securely fastened to the bottom of each frame and anchors for each jamb spaced a 24 inch maximum intervals.

2.05 DOOR ASSEMBLIES

A. Integrated Door Assemblies shall meet or exceed ANSI/BHMA A156.32 Standard for Integrated Opening Assemblies.

B. Door assemblies shall include door body with factory installed latching/locking devices and will include:
   1. A continuous hinge or a hinging system suitable to match the performance and duty of the application. When used, stainless steel continuous hinges should be standard with medical bearings and welded end pins.
   2. An adjustable leading edge with hidden lock mounting fasteners.
   3. Doors shall be constructed with a U-shaped, 16 gauge reinforcement channel top and bottom and will include metal internal reinforcements for closers and magnetic holder/releases.
   4. Door assemblies shall be tested and listed for use without the need for overlapping astragals.

C. Doors shall conform to ANSI/SDI A250.8, Grade 1 for Steel Doors. Doors shall be 1-3/4” thick, with no seams or spot welds on door face and be of manufacturer’s standard construction: Door face skins to be minimum 18 gauge cold rolled steel; door core construction shall be determined by application, building codes, and fire label requirements. Door core choices shall be:

D. Door cores: Honeyconb, Temperature Rise, and Polystyrene

2.06 CONTINUOUS HINGES

A. Continuous hinges shall meet ANSI/BHMA A156.26 requirements.

B. Continuous hinge used shall be selected based on performance requirements of opening.

2.07 INTEGRATED LOCKING/LATCHING HARDWARE

A. General
   1. Provide a complete integrated door opening assembly including the installation and adjustment of the latching mechanism within the door construction.
   2. Latching to be accomplished by single or optional multi-point mechanism. Top latching shall be accomplished by friction reducing latch bolt with 7/8” throw.
   3. The top strike shall be mortised flush with no projections and painted to match the jamb.

B. Integrated Exit Devices (XT Series)
   1. Shall meet ANSI/BHMA A156.3, Grade 1 requirements
   2. Panic Exit Devices: Listed and labeled by a Nationally Recognized Independent Testing Laboratory for panic protection to UL 305.

3. Fire Exit Devices: Listed and labeled by a Nationally Recognized Independent Testing Laboratory for panic and fire protection to UL 10C and UL 305.
4. Exit devices shall be clean and unobtrusive in design with a nominal bar height of 4 inches. The push bar of exit devices shall not exceed a projection of 3/16 inch when the door is in the held open position and 1-3/16 inches when the door is closed and shall be made of heavy duty aluminum extrusion, available in anodized and true architectural finishes using a metal cladding; end caps shall metal with ¼ inch maximum width and include concealed fasteners.
5. To prevent pinch hazards, the clearance tolerances between the pushpad and door pocket shall not exceed 7/64 inch.
6. Exit devices shall have CleanVue* hygienic release feature allowing for full access to the recessed pushbar for cleaning without disassembly.
7. Outside lever trim, when required, shall be clean and unobtrusive in design with a maximum projection of 2-1/2 inches and shall match design of other hardware furnished on project unless otherwise specified. No escutcheons shall be required. Lever mechanism must be protected by integral clutch assembly. Lever can be locked by cylinder as required.
8. Optional electric operation of exit device shall be accomplished with the use of a motor that retracts bar to a 3/16 inch projection.
9. Optional electrified lever operation shall be accomplished via an integral low-current solenoid.

C. Single Lever or Lever X Lever Latch (LX Series)
1. Levers shall be clean and unobtrusive in design with a maximum projection of 2-1/2 inches and shall match design of other hardware furnished on project unless otherwise specified. No escutcheons shall be required. Lever mechanism must be protected by integral clutch assembly. Lever can be locked or unlocked by cylinder as required.
2. Lever operation can be accomplished on one or both sides of the door.
3. Levers shall operate and secure each leaf of a pair of doors independently without the need for coordinators, astragals, and automatic flushbolts.
4. Provide optional electrified lever operation shall be accomplished via an integral low-current solenoid when required by the drawing design.
5. Provide optional electric latch retraction shall be accomplished with the use of motorized when required by the drawing design. platform.
6. Door systems are listed for fire protection per UL 10C.

D. Push Pad (PX Series)
1. Push Pad shall be clean and unobtrusive in design with a minimal bar height of 4 inches and a length of 8”. The push pad shall not exceed a projection of 3/16 inch when in the held open position and 1-3/16 inches when closed and shall be made of heavy duty aluminum extrusion, available in anodized and true architectural finishes using a metal cladding; end caps shall metal with ¼ inch maximum width and include concealed fasteners.
2. To prevent pinch hazards, the clearance tolerances between the pushpad and door pocket shall not exceed 7/64 inch.
3. Outside lever trim, when required, shall be clean and unobtrusive in design with a maximum projection of 2-1/2 inches and shall match design of other hardware furnished on project unless otherwise specified. No escutcheons shall be required. Lever mechanism must be protected by integral clutch assembly. Lever can be locked by cylinder as required.
4. Optional electrified lever operation shall be accomplished via an integral low-current solenoid.
5. Push pad and latching mechanism are listed for fire protection per UL 10C.

2.08 GASKETING

A. Shall be a compression type product for use with steel doors and labeled for use on fire-rated doors.

B. Meeting stile gasket shall be arranged to conceal the adjusting fasteners on adjustable door edge.

2.09 FINISH REQUIREMENTS

A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. FINISHES
   1. Door Faces: Primed for Field applied finish, Factory applied finish powder coat paint per specification, and Surfacequest© Architectural Fusions as indicated on the drawings.
   2. Frames: Primed for field applied finish
   3. Lite Kits:
      a. Primed for field applied finish
      b. Factory applied finish paint per specification
   4. Hardware: As specified in the Hardware Schedule. See Schedule listed in this section..

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine rough openings and other site conditions for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction and other conditions effecting performance.

B. Examine rough-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.02 INSTALLATION

A. Steel doors shall be prepared for all non-factory installed hardware per ANSI/BHMA A156.115.

B. Installation shall be in accordance with DHI A115.IG.

C. Install work in accordance with approved shop drawings and these specifications using factory authorized installers.

D. Set frames plumb and square and brace until adjacent wall or finish is constructed and securely anchored thereto. Furnish necessary clips, fastenings and anchorages and conceal unless otherwise noted.

E. Fire doors shall be installed conforming to NFPA 80 and all other applicable building codes and regulations.

F. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

G. Install all non-factory installed hardware items using only fasteners provided or authorized by manufacturer.

3.03 DOOR CLOSING DEVICES

A. Door closing devices shall be installed in accordance with the templates and printed instructions supplied by the manufacturer of the devices.

B. Door closing devices with adjustable spring power shall be adjusted for proper door operation and compliance with all applicable codes and regulations.

3.04 ADJUSTING

A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit.

3.05 COMPLETION

A. When complete all door, frame, hardware and other components shall be properly secured in place and all exposed surfaces shall be clean and free from scratches and other defects and damages.

3.06 DOOR HARDWARE SETS

A. The following is a general listing of Integrated Door Assembly hardware requirements. The base Integrated Door Assembly is provided with the following pre-installed items:
   1. Door body
   2. Latching mechanism
   3. Continuous hinge
   4. Adjustable edge
   5. Provide additional hardware items as required for function indicated and to meet applicable code requirements whether or not specifically indicated in the following sets.

B. Refer to Door Schedule for door opening information, hardware set assignment and related requirements.

3.07 HARDWARE SCHEDULE

Pair of doors, same swing, cross corridor held open with exit device x lever trim

2	* Full Mortise Cont. hinges	EM or EMA	630/628	SYN
2	Exit device x lever trim	XT-L	630	SYN
2	Surface Closers	CLSC16	689	SYN
2	Wall Magnets	DH1	628	SYN
1 Set	Smoke Seal	SS	DBZ	SYN
1	Kickplate	KP	630	SYN

*Stainless steel or Aluminum Geared Continuous Hinges - also available as Swing Clear (Specify SC).

END OF SECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes one resinous flooring system with epoxy body.
   1. Application Method: Flat metal or plastic blade, power or hand troweled.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Verification: For each resinous flooring system required, 5 inches (150 mm) square, applied to a rigid backing.

C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on the Drawings.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

E. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.04 QUALITY ASSURANCE

A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. Epoxy resin mortar based flooring system, 12% post-consumer glass with urethane sealers). Equivalent materials of other manufactures may be substituted only on approval of Architect/Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section. See Section 012500 - PRODUCT SUBSTITUTION PROCEDURES.

B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
   1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
   2. Contractor shall have completed at least 10 projects of similar size and complexity.

C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.

1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Apply full-thickness mockups on 48-inch (1200-mm) square floor area selected by Architect.
      a. Include 48-inch (1200-mm) length of integral cove base.
   2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion and final color match is visually seamless.

F. Pre-installation Conference:
   1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
   2. Attendance:
      a. General Contractor
      b. Architect/Owner's Representative.
      c. Manufacturer/Installer's Representative.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store material per product data sheet.

C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
   1. Maintain material and substrate temperature between 65 and 85 deg F (18 and 30 deg C) during resinous flooring application and for not less than 24 hours after application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

D. Concrete substrate shall be properly cured. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

1.07 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally

warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 PRODUCTS

2.01 RESINOUS FLOORING (SRU-1) & (SRU-2)

A. Acceptable Manufactures,
   1. Stonhard (Basis of Design).
   2. Architect approved equivalent.

B. Product: Subject to compliance with requirements:
   1. Stonhard, Inc.; Stonblend GSI-G®.
   2. Architect approved equivalent.

C. System Characteristics:
   1. Color and Pattern: Cork, Wolf Gray, or as indicated on the drawings
   2. Wearing Surface: smooth Matte finish.
   3. Integral Cove Base: Cork, Wolf Gray, or as selected by the Architect from the manufacturer's full color and pattern offering.
      a. Base Height: 4 inch
   4. Overall System Thickness: 3/16 inch (5 mm).

D. System Components: Manufacturer's standard components that are compatible with each other and as follows:
   1. Primer:
      a. Material Basis: Stonblend Primer.
      b. Resin: Epoxy.
      c. Formulation Description: Two (2) component, 100% solids.
      d. Type: Non-pigmented.
      e. Finish: Standard.
      f. Number of Coats: One (1).
   2. Mortar Base:
      a. Material Basis: Stonblend Mortar.
      b. Resin: Epoxy.
      c. Formulation Description: Four (4) component, 100% solids.
      d. Application Method: Flat Metal or plastic blade trowel.
         1) Thickness of Coat(s): 3/16 inch (5 mm).
         2) Number of Coats: One (1).
      e. Aggregates: Pigmented quartz Blended aggregate and 12% post-consumer recycled colored glass.
   3. Grout Coat:
      a. Material Basis: Stonblend Groutcoat
      b. Resin: Epoxy.
      c. Formulation Description: Two (2) component, 100% high solids.
      d. Type: Clear.
      e. Finish: Standard.
      f. Number of Coats: One (1).
   4. Sealer:
      a. Material Basis: Stonkote CE4.
      b. Resin: Epoxy
      c. Formulation Description: Two (2) component, 100% solids.
      d. Type: Clear.
      e. Finish: Matte.
      f. Number of Coats: One (1).

5. Topcoat:
   a. Material Basis: Stonseal CF7.
   b. Resin: VOC EPA Compliant, Waterborne, Aliphatic Polyurethane.
   c. Formulation Description: Two (2) component 100% high solids.
   d. Type: Clear.
   e. Finish: Matte.
   f. Number of Coats: Two (2).

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1.	Compressive Strength, ASTM C579:	6,000 psi after 7 days.
2.	Tensile Strength, ASTM C307:	1,500 psi.
3.	Flexural Strength, ASTM C580:	2,200 psi.
4.	Flexural Modulus of Elasticity, ASTM C580:	5.0 x 105 psi
5.	Hardness, ASTM D2240:	85 to 90, Shore D.
6.	Impact Resistance, ASTM D2794:	> 160 in. lbs.
7.	Abrasion Resistance, ASTM D4060, CS-17:	0.06 gm max. weight loss.
8.	Flammability, ASTM E648 and ASTM E662:	Class 1
9.	Thermal Coefficient of Linear Expansion:	9 x 10-6 in./in./degree F
10.	VOC Content per ASTM D2369, Method E	
	a. Stonblend Primer:	75 g/l
	b. Stonblend GSI Base:	17 g/l
	c. Stonblend Groutcoat:	52 g/l
	d. Stonkote CE4:	34 g/l
	e. Stonseal CF7:	47 g/l (Method C)
11.	Cure Rate: 12 hours for foot traffic, 24 hours normal operations.	

2.02 ACCESSORY MATERIALS

A. Primer: Type recommended by manufacturer for substrate and body coats indicated. Formulation Description: Stonhard Stonblend Primer, 100% solids.

B. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated. Formulation Description Only if application above grade Stonproof ME7.

C. Patching, Leveling and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

D. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for Stonflex MP7 joint fill material.

PART 3 EXECUTION

3.01 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean and dry substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
   1. Mechanically prepare substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup or Diamond Grind with a dust free system.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates meet the following requirements.
   a. Perform in situ probe test, ASTM F2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 85 percent.
   b. Perform anhydrous calcium chloride test, ASTM F1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 6 lb of water/1000 sq. ft. of slab in 24 hours.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

3.02 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
   1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
   2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
   3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
      a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

C. Integral Cove Base: Stonblend GSI mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
   1. Integral Cove Base: As indicated on the Drawings or As selected by the Architect..

D. Troweled Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate using manufacturer's specially designed screed box adjusted to manufacturer's recommended height. Hand trowel apply mixed material over freshly primed substrate using steel finishing trowels or power trowel material using manufacturer's specially designed power trowel blades.

E. Groutcoat: Remove excess unbonded granules by lightly abrading or scraping and vacuuming the floor surface. Mix and apply grout coat with strict adherence to manufacturer's installation procedures and coverage rates.

F. Sealer: Lightly sand or scrape surface to remove any floor surface irregularities. Mix and apply sealer with strict adherence to manufacturer's installation procedures.

G. Matte Finish: Lightly sand or scrape surface to remove any floor surface irregularities. Mix and roller apply mar resistant finish with strict adherence to manufacturer's installation procedures.

3.03 TERMINATIONS

A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.04 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Vertical and horizontal contraction and expansion joints are treated by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.05 FIELD QUALITY CONTROL

A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.
   1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
   2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
   3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.06 CLEANING, PROTECTING, AND CURING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer. General Contractor is responsible for cleaning prior to inspection.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabric-covered fiberglass core wall panels and mounting accessories.

B. Fabric-covered fiberglass core ceiling baffles.

1.02 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.

D. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

1.03 SUBMITTALS

A. See Section 013300 - SUBMITTALS, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel sizes, shapes and layouts, color and texture schedule and fabric orientation.

D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available .

E. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch (305 by 305 mm), showing construction, edge details, and fabric covering.

F. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016100 - BASIC PRODUCT REQUIREMENTS, for additional provisions.
   2. Extra Panels: Quantity equal to 5 percent of total installed, but not less than one of each type.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company with not less than ten years of experience in manufacturing acoustical products similar to those specified.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.

B. Store panels flat, in dry, well-ventilated space; do not stand panels on end.

C. Protect panel edges from damage.

1.06 MOCK-UP

A. See Section 014500 - QUALITY CONTROL, for additional mock-up requirements.

B. Construct mock-up of acoustical panels at location indicated by Architect/Engineer.
   1. Minimum mock-up dimensions; 96 by 96 inches (2440 by 2440 mm).
   2. Approved mock-up may remain as part of the Work.

1.07 WARRANTY

A. Provide manufacturer's 1-year limited warranty covering defects in materials and / or factory workmanship for Acoustical canopy ceiling systems.

B. Provide manufacturer's 1-year limited warranty covering defects in materials and / or factory workmanship for Acoustical wall systems.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fabric-Covered Acoustical Panels:
   1. Armstrong World Industries, Inc: SOUNDSCAPES Blades Linear Acoustical Panels www.armstrong.com.
   2. Architect approved equivalent.
   3. Substitutions: 012500 - PRODUCT SUBSTITUTION PROCEDURES

B. Provide all Linear Acoustical Panels by one manufacturer.

2.02 FABRIC-COVERED LINEAR ACOUSTICAL CEILING PANELS (ACB-2)

A. Linear Ceiling Panels: Prefinished, factory assembled fabric-covered panels.
   1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   2. Light reflectance: 0.90 (White).
   3. Other Linear Panel Characteristics:
      a. Washable
      b. Scratch Resistant
      c. Soil Resistant
      d. 71% Recycled content

B. Fiberglass Core Panels:
   1. Density: 7 to 10 lb/cu ft (112 to 160 kg/cu m).
   2. Noise Reduction Coefficient (NRC): 1.15 (6 inch Blade spacing) when tested in accordance with ASTM C423.
   3. Panel Thickness: 2 inches and as indicated on the drawings..
   4. Panel Height: 10 inches and as indicated on the drawings.
   5. Panel Height: 10 inches and as indicated on the drawings.
   6. Edges: Perimeter edges - Square with Durabrite scrim on all sides.
   7. Corners: Square.
   8. Mounting: Direct to Grid Suspension System.
   9. Seismic Restraint: Contractor shall refer to ASCE 7, Section 13.5, Architectural Components for seismic requirements.

C. Fabric Covering: Seamless fabric facing material, for stretched covering of core material.
   1. Fabric: Durabrite scrim on all sides with finished square edges..
   2. Color(s): White, Sky, Lagoon, Tangerine, and as indicated on the drawings..

2.03 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
   1. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
   2. For panels suspended from ceiling, provide fabric covering both sides, with seams only at panel edges.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch (1.6 mm) for thickness, overall length and width, and squareness from corner to corner.

2.04 ACCESSORIES

A. Provide Main Beam, Cross Tees, wall angle moldings and other accessories to complete the installation of Linear Acoustic Baffle systems in accordance with the manufacture's specifications, instructions and recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical Linear Baffles. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical Linear Baffles in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

B. Install Acoustical Linear Baffles in strict accordance with the manufacturers installation instructions. Provide minimum clearances between panels.

C. Coordinate Linear Baffles locations with the fire sprinkler and fire / smoke detection systems to insure that these systems shall comply with NFPA 13 and local codes where they are included in the work of the project. Failure to coordinate this work may cause field adjustments to be required in order to obtain final approvals of these systems accordingly which shall be done at no additional cost to the Owner.

D. Ceiling Linear Baffles shall be handled and installed by a team of at least two persons in accordance with the manufacturers instructions.

E. Linear Baffles edge protectors shall remain in place until panel is installed. Field painting shall not be permitted. Damaged or scuffed panels shall be replaced with new panels at no additional cost to the Owner.

F. Install panels to construction tolerances of plus or minus 1/16 inch (1.6 mm) for the following:
   1. Plumb and level.
   2. Spacing of Linear Panels.

3.03 CLEANING

A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.

3.04 PROTECTION

A. Provide protection of installed acoustical wall panels and suspended canopies until completion of the work.

B. Replace Linear Baffles that cannot be cleaned and repaired to satisfaction of the Architect/Engineer.

END OF SECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of the Agreement, including General and Supplementary Conditions, and Division 01 of the Project Manual, apply to the work of this Section.

1.02 SUMMARY

A. Section Includes:
   1. Wood Veneer Acoustical sound absorptive panels.

1.03 SUBMITTALS

A. Comply with Section 013300 - SUBMITTAL PROCEDURES.

B. Product Data: Manufacturer’s technical data and installation instructions for each type of wall panel required.

C. Certifications: Certified test reports showing compliance with performance requirements specified.

D. Samples: Submit a minimum of three (3) samples of each panel type and finish type required. Include samples that show the range of variation expected in grain, texture and color.

E. Shop drawings: Submit shop drawings showing overall layout with dimensions and details of penetrations and intersections with other materials or building components.

F. Submit operation and maintenance data for installed products. Include precautions relating to harmful cleaning materials and methods that would affect the service life of the panels.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility: Provide acoustic wall panels from a single Manufacturer with at least two (2) years of prior experience fabricating projects of similar size and complexity.

B. Installer: Installation shall be done by qualified Carpenters experienced in the installation of architectural woodwork. Installers must receive training on handling, cutting, machining and field finishing the specified product prior to receiving materials on site.

C. Fire Performance Characteristics: Class A as tested by an independent accredited testing facility. Tests: ASTM E84- Flame spread: 25 or less - Smoke developed: 450 or less as specified by State or local codes.

D. Coordination of Work: Installing contractor shall organize and conduct a pre-installation survey of temperature, humidity, and construction elements attaching, penetrating, or concealed behind the acoustic wall panels.

E. Acoustic wall panels to be manufactured from no less than 67 percent post-industrial recycled materials by weight.

1.05 REFERENCES

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.

B. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials; 2012 (Reapproved 2020).

C. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings; 2020.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver panels to the project in original, unopened packages. Inspect containers for visible damage and report any questionable condition to the shipper and manufacturer immediately.

B. Store products in a fully enclosed, clean, dry space, off the ground, out of direct sunlight and protected from damage with temperature controlled between 50 and 86 degrees F.

C. Handle products carefully to avoid damaging panel surfaces or chipping edges. Report any damage immediately. Do not install damaged panels, they are not covered by the manufacturer’s warranty.

1.07 PROJECT CONDITIONS

A. Do not install acoustic wall panels until space is enclosed and weather-proofed, wet work is completely dry, all dust producing work is complete, and ambient temperature and humidity conditions are maintained at the levels required by the manufacturer.

B. Permit panels to reach room temperature, 68 to 80 degrees F, and stabilized moisture content of 35% to 55% RH for at least 72 hours before installation per AWI standards. Building should be enclosed and HVAC systems functioning in continuous operation with relative humidity maintained between 35 and 55 percent.

1.08 WARRANTY

A. Provide manufacturer’s standard one-year written product warranty per Section 017800 - CLOSEOUT SUBMITTALS.

1.09 MAINTENANCE

A. Maintenance Instructions: Provide manufacturers standard maintenance and cleaning instructions for finishes provided.

B. Extra Materials
   1. Deliver three (3) small panels and two (2) large panels complete with concealed mounting hardware for extra stock.
   2. Extra materials shall be from the same production run as the original materials.
   3. Extra materials shall remain in the manufacturer’s original unopened packaging and stored in a fully enclosed, clean, dry space out of direct sunlight and protected from damage with temperature controlled between 50 degrees F and 86 degrees F. Clearly mark packages “Small Acoustical Panels” and “Large Acoustical Panels”.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide wall system utilizing “QUADRILLO”, QPP-19 (1 1/8 inch)(NRC 0.70) - F5 Mounting, as manufactured by Decoustics., 61 Royal Group Crescent, Woodbridge, Ontario, L4H 1 X9 Canada. Tel.: (800) 367-3809.

B. Architect approved equivalent meeting all acoustical, dimensional, veneer, concealed attachment and color requirements of the specified acoustical panels.

2.02 MATERIALS (AWP-1)

A. QUADRILLO; QPP-19 (1 1/8 inch)(NRC 0.70) - F5 Mounting, for interior installation, acoustical or decorative panels as follows: A natural wood veneer with v-groove architectural face laminated to a high performance acoustical core. Core material is made from a no-added urea formaldehyde MDF material. Open area of the panels is approximately 4%.

B. Panel Perforations: Open area of the panels is approximately 4%. The perforations must be clean, without rounded edges or grain pull out between perforations. A minimum of 99.5% of the perforations must be acoustically functional. Perforations must maintain consistent diameter through the face and backer, with no tapering or roughness.

C. Panels Edge Treatment: Panels will be edge banded with the matching veneer finish.

D. Veneer:
   1. Species: as selected by the Architect from manufacturer's full species offering. and Stain finish in color as selected by the Architect from the manufacturer's full color offering.
   2. Surface Sheen: as selected by the Architect from the manufacturer's full offering of surface sheens available.
   3. Cut: Quarter Sliced (standard).
   4. Matching veneer leaves: Slip Matched (Standard).
   5. Finishes shall be applied in the shop: Clear

E. V- Groove width: 3mm.

F. Rib Width: 5 mm.

G. Groove direction: Vertical

H. Groove spacing: 5mm or 10mm as indicated or scheduled on the drawings.

I. Panel Reveals: Open with 1/4 inch reveals or as noted on the drawings.

J. Panel Weight: QPP -25 panels: 3.5 lbs/sq. ft. (panels only).

K. Panel Sizes: See contract drawings for acoustical panel sizes and locations.

L. Curved Panels:
   1. Minimum outside curve radius: 16 inches.
   2. Minimum Inside curve radius: 24 inches.

M. Flame Resistance: Class A rating based on ASTM E84 Standard Test Method for Surface Burning Characteristics in Building Materials. Some veneer species and other face materials

may not achieve an overall Class A rating. Check with local building codes for requirements or exemptions.

N. NRC Performance: Noise Reduction Coefficient for acoustical panels to be no less than the NRC listed in this section when using Type F5 mounting.

O. STC Performance: Sound Transmission Class to be no less than 37 using ASTM Test Method ASTM E336.

P. Panel Stability: Linear contraction or expansion to not exceed 0.4% maximum variation in width or height per ASTM D1037.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Inspect installation area and conditions under which work is to be performed for compliance with all manufacturers' environmental requirements. All wet work in the installation area must be complete, cured and dry prior to installation. Do not proceed until all unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Installation must be done by qualified carpenters experienced in the installation of architectural woodwork. The firm must demonstrate successful experience installing materials of similar type and quality of those required for this project. The use of proper carpentry tools and techniques will be required for the installation. Panels to be installed plumb and level.

B. Comply with manufacturer's instruction and recommendations for installation of wall panels consistent with industry standards.

C. Confirm all field dimensions are coordinated with shop drawings.

D. Coordinate the exact size, location and sequencing of panels including penetrations with all building components.

E. Lay out wall panels per approved shop drawings. Report any interferences or deviations before proceeding. Note: Panels installed monolithically will have kerfed edges with splines to level panel faces. Panels have machined edges to simulate the 3mm v-groove when butted against each other.

F. Final installation of acoustical panels shall be just before substantial completion. Once installed, protect panels from dirt and damage.

3.03 ADJUSTING AND CLEANING

A. Clean soiled surfaces of wall panels per manufacturer's instructions.

B. Remove and replace damaged or discolored materials not in compliance with manufacturer's tolerances.

C. Adjust panels after final installation so that surfaces are aligned with gaps or reveals between units straight and consistent in width.

END OF SECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Unitized-panel demountable partitions.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

C. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.

D. ASTM E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2022.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.

F. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

G. ASTM E413 - Classification for Rating Sound Insulation; 2022.

H. BIFMA X5.6 - Panel Systems - Tests; 2016 (Reapproved 2021).

1.04 DEFINITION

A. The movable wall system shall offer maximum flexibility and reusability to accommodate frequent and quick relocation work without loss of materials, damage or modification to panels or to adjoining structures such as ceilings, fixed walls and floors. The system must be unitized, non-progressive and modular, allowing the removal of individual panels from any location without disturbing adjoining units and providing interchangeability of panels and door units on the same module.

B. The system can offer a single center reveal design with optional concealed slotting for wall-hung furniture components utilizing a pliable recessed panel connector, a shallow panel connector between panels provides a single center reveal design which matches the finish of the panel face, or a flush connector finished to match the panel to provide a monolithic aesthetic. The head detail is either recessed or flush. The base assembly with an integrated leveling system shall be permanently attached to the panel. Detached and loosely shipped floor tracks and leveling components shall not be permitted.

C. The solid panels shall be available in a choice of finishes to include marker board steel, wood veneer. Panels are stackable to accommodate ceiling height changes and panel type changes (i.e., solid/glass). Panel shells shall be removable and interchangeable in the field without dismantling as complete units.

1.05 PERFORMANCE REQUIREMENTS

A. Adjustability: An adjustable, u-channel head assembly shall provide a ± 1/2" adjustment at the ceiling. At the floor, a self-contained leveling glide system and a flush 5"-high base cover shall allow for an adjustment of ± 1 ½" for a 5" base. Combined, this shall provide an overall vertical adjustment of ± 2" for 5" to compensate for ceiling and floor irregularities.
   1. Where the wall system meets the building core walls, columns or window mullions, a telescopic, spring-loaded wall post or u-channel shall allow for a ±1" horizontal adjustment.

B. Electrical & Communications: Typically, power/communications cables and components shall be provided and field-installed (hardwired) by the electrical contractor. Wiring access shall be through or around the ceiling channel, and distribution shall run vertically or horizontally anywhere within the panel, from panel to panel or through the base and ceiling wire ways. Electrical outlets shall be located flush in the base or in the panel shell.

C. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 450 or less.

D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

E. Structural Performance: Provide demountable partitions capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Load-Bearing Capacity: Not less than 2.3-lb/linear inch distributed proof load when tested according to BIFMA X5.6.
   2. Transverse-Load Capacity: Lateral deflection of not more than 1/240 of the overall span when tested under a uniformly distributed load of 5 lb/sq. ft. according to ASTM E72.

F. Acoustical Performance: Where acoustical rating is indicated, provide demountable-partition assembly tested by a qualified testing agency for sound transmission loss performance according to ASTM E90, calculated according to ASTM E413, and rated for not less than the STC value indicated.

1.06 SUBMITTALS

A. See Section 013300 - SUBMITTALS, for submittal procedures.

B. Product Data: Product data on physical characteristics, durability, resistance to fading, and flame spread characteristics for each type of partition and accessory.
   1. "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings: Indicate plans, elevations, sections, attachment details at floors, columns, permanent construction and ceilings, and method of erection and disassembly.

D. Samples: Submit two samples 6 inches square in size illustrating wall covering facing and trim colors and finish.

E. Samples for Initial Selection: For each type of exposed finish.
   1. Include Samples of hardware and accessories involving color or finish selection.

F. Samples for Verification: For each type of the following products:
   1. Face-Panel Finish: Manufacturer's standard-size unit, but not less than 6 inches square.
   2. Linear Trim: 12-inch- long Samples.
   3. Door Finish: Manufacturer's standard-size unit, but not less than 3 inches square.
   4. Glazing: Manufacturer's standard-size unit, but not less than 3 inches square.
   5. Hardware and Accessories: Whole units.

1.07 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from the installers of the items involved.
   1. Suspended-ceiling components and dimensioned ceiling-grid layout.
   2. Locations of fixed door and window mullions.
   3. Seismic bracing and related structural members.
   4. Ductwork above ceiling.

B. Product Certificates: For each type of demountable partition.

C. Product Test Reports: For each type of demountable-partition assembly, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Manufacturer's Instructions: Indicate special procedures.

E. Manufacturer's Qualification Statement.

F. Installer's Qualification Statement.

1.08 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.09 CLOSEOUT SUBMITTALS

A. Maintenance Data: For demountable partitions to include in maintenance manuals.

1.10 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.11 FIELD CONDITIONS

A. Finished Spaces: Do not deliver or install demountable partitions until finishes in spaces to receive them are complete, including suspended ceilings, floors, carpeting, and painting.

B. Field Measurements: Indicate measurements on Shop Drawings.

1.12 WARRANTY

A. Demountable wall panels, glazed units, door frames, and related components to be without defects in material or workmanship for a period of ten (10) years from the date of acceptance of

work. Wood veneer wrapped parts shall be warranted to be without defects in material or workmanship for a period of five (5) years from the date of delivery. Wood doors shall be warranted for ten (10) years from the date of delivery, subject to the manufacturer's terms and conditions. This warranty does not cover defects or damage resulting from accidents, misuse, improper relocation methods or transfer to storage. Vinyl and textile wall coverings, plastic laminates, and wood veneer finishes are not warranted against fading or wearing, or if improperly cleaned or treated by the Owner or by others.

PART 2 PRODUCTS

2.01 UNITIZED-PANEL DEMOUNTABLE PARTITIONS (DPP-1)

A. General: Unitized, nonprogressive, demountable-partition assembly and components that are the standard products of the manufacturer.
   1. Manufacturer: Demountable-partition shall be as “Genius Architectural Wall” manufactured by KI of Green Bay Wisconsin, Tel. (920)468-8100.
   2. Architect approved equivalent.

B. Acoustical Rating: STC 48 for solid panels.

C. Solid Panels With Project Specific Substrate: 3 1/2 inches thick consisting of an aluminum extruded frame construction, two removable panel shell assemblies each composed of Wood Veneer face laminated to MDF, non-toxic fiberglass insulation, and base assembly. Top of panel engages the ceiling channel. Aluminum frames (including glass panels) as a standard will have cavities on each side to accommodate cabling. Field notching the horizontal frame members to allow easy cable access from ceiling or floor. As standard, solid panel vertical frame posts can be slotted for hang-on furniture and the slots concealed by a dual durometer PVC gasket, 1" wide recessed from panel face or by a flush to panel face 1" wide recessed from panel face or by a flush to panel face connector. Panels to contain integral, adjustable bottom connectors, and the panel shells equipped with a mushroom-shaped extrusion that forms a compression fit with the vertical frame for easy removal from the frame structure.

D. Unitized Panels: Manufacturer's standard two removable panel shell assemblies each composed of Wood Veneer face laminated to MDF, non-toxic fiberglass insulation, and base assembly.
   1. Thickness: 3 1/2 inches.
   2. Panel Widths: Modular, as indicated on Drawings, except for required filler panels.
   3. Facing: Wood veneer.
      a. Color, Texture, and Pattern: Formica 6413-NG "Silver Riftwood".

E. Accessory Panels: Manufacturer's standard porcelain-enamel markerboard.

F. Framing: Aluminum.
   1. Exposed Finish: Factory-applied Powder Coat Paint, Color: As indicated on the drawings.
   2. Glazed frame Vertical Dimension: 1.9 inch

G. Trim: Continuous, factory-finished, snap-on type; adjustable for variations in floor and ceiling levels.
   1. Trim Material: Aluminum.
   2. Base Profile: Flush.
   3. Ceiling Trim Profile: Recessed.
   4. Exposed-Metal Trim Finish: Factory-applied Powder Coat Paint. Color: As indicated on the drawings.
   5. Exposed Metal Trim Finish: Clear-anodized, AAMA 611, Class II, 0.010 mm or thicker clear anodic coating over a nonspecular as fabricated mechanical finish.

H. Doors: Manufacturer's standard 1-3/4-inch thick, Aluminum Framed Glass Swing Door with 2 1/8 inch Stiles door construction.
   1. Door Type: Single Swing.
   2. Aluminum Door Finish: Factory-applied Powder Coat Paint. Color: As selected by the Architect from the manufacturer's full color offering.

I. Hardware: As specified in Section 087100 - DOOR HARDWARE or as specified herein.

J. Glazing Frames: Manufacturer's standard aluminum frames for glazing thickness indicated.
   1. Frame Finish: Factory-applied Powder Coat Paint. Color: As indicated on the drawings.

K. Glazing:
   1. Thickness: 3/8 inch (10mm) standard tempered glass.

L. Seals: Manufacturer's standard.

2.02 FABRICATION

A. General: Fabricate demountable walls for installation with concealed fastening devices and pressure-fit members that will not damage ceiling or floor coverings. Fabricate systems for installation with continuous seals at floor, ceiling, and other locations where partitions abut fixed construction.

B. Panels for Site-Assembled Demountable Partitions: Face panels fabricated and finished in modular widths indicated.
   1. Transom Panels: Fabricated in material and finish to match wall panels unless otherwise indicated.

C. Panels for Unitized-Panel Demountable Partitions: Factory-assembled, flush, unitized-panel construction; with faces smooth and free of buckles, oil canning, and seams; and insulated with solidly packed, inorganic, mineral filler.
   1. Factory glaze panels to the greatest extent possible.

D. Finish Facings: Factory apply finish-facing materials with appropriate backings, using mildew-resistant nonstaining adhesive as recommended by finish-material manufacturer's written instructions.
   1. Apply facing to panel in one piece, seamless.

2.03 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.04 MATERIALS

A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Glazing:
   1. Tempered Glass: Annealed flat glass meeting requirements of ASTM C1036, Type 1-Transparent Flat, Class 1-Clear, Quality Q3, and fully tempered in accordance with ASTM C1048, Kind FT.

a. Thickness: 3/8 inch (9.5 mm).
b. Prepare glazing panels for indicated fittings and hardware before tempering.
c. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.

C. Wood Materials:
1. Wood Veneer: Genuine wood veneer; clear, vertical grain, straight, and kiln dried; of wood species indicated, laminated to panel substrate with moisture-resistant adhesive.

2.05 FITTINGS AND HARDWARE

A. Non-Locking Ladder Pulls: Tubular pull handles.
1. Mounting: As indicated on drawings.
2. Diameter: 1-3/8 inch (35 mm).
3. Length: 28-3/8 inch (720 mm).
4. Pull Material: Stainless steel.
5. Finish: Satin.
6. Door Thickness: 1-3/4 inch (44.5 mm).
7. Door Material: Glass.
8. Provide accessories as required for complete installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building conditions are ready to receive partitions and that field measured dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install partitions after placement of carpet. Install demountable partitions after other finishing operations have been completed.
1. Install partitions rigid, level, plumb, and aligned. Install seals at connections with floors, ceilings, fixed walls, and abutting surfaces to prevent light and sound transmission.
2. Broken, cracked, chipped, deformed, or unmatched panels and components are not acceptable.
3. Except for filler panels scribed to fixed walls or columns, do not modify manufacturer's standard components.

B. Suspended-Ceiling System: Do not alter suspended-ceiling system.

C. Doors and Frames: Install door-and-frame and glazing-and-glazing-frame assemblies securely anchored to partitions and with doors aligned and fitted. Install and adjust door hardware for proper operation.

3.03 TOLERANCES

A. Install each demountable partition so surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent partitions.

3.04 ADJUSTING

A. Adjust doors and frames to provide smooth door operation from open to closed position without gravity movement of door from any position.

B. Check and readjust operating hardware. Verify that latches and locks engage accurately and securely without forcing or binding; lubricate as recommended by manufacturer.

C. Inspect installation, correct misalignments, and tighten loose connections.

D. Clean soiled surfaces to remove dirt, fingerprints, adhesives, and other foreign materials according to manufacturer's written instructions.

E. Remove and replace defaced or damaged components that cannot be satisfactorily repaired.

F. Remove and replace components that are wet, moisture damaged, or mold damaged.

3.05 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain demountable partitions.

3.06 PROTECTION

A. Do not permit subsequent construction activities to cause damage to appearance or operation of installed partition components before Date of Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes passenger elevators including but not limited to:
   1. Pre-engineered MRL Traction passenger elevator.
   2. Elevator Car enclosure, hoistway entrances and signal equipment.
   3. MRL Equipment
   4. Operation and control systems.
   5. Accessibility provisions for physically handicapped persons.
   6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated capacity and speed.
   7. Materials and accessories as required to complete the elevator installation.

1.03 RELATED REQUIREMENTS:

A. Section 015000 - Temporary Facilities and Controls: protection of openings and personnel barriers, temporary power and lighting.

B. Section 033000 - CAST-IN PLACE CONCRETE for setting sleeves, inserts, and anchoring devices in concrete.

C. Section 042200 - CONCRETE UNIT MASONRY for setting sleeves, inserts, and anchoring devices and coordinating wall openings for oil line and wiring ducts in masonry and for grouting elevator entrance frames installed in masonry walls.

D. Section 051200 - Structural Steel Framing for the following:
   1. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
   2. Divider beams.
   3. Hoist beams.
   4. Structural-steel shapes for subsills that are part of steel frame.

E. Section 055000 - METAL FABRICATIONS for the following:
   1. Attachment plates and angle brackets for supporting guide-rail brackets.
   2. Divider beams.
   3. Hoist beams.
   4. Structural-steel shapes for subsills.
   5. Pit ladders.
   6. Cants in hoistways made from steel sheet.

F. Division 07: Waterproofing: waterproofing of elevator pits.

G. Division 09 for finish flooring in elevator cars.

H. Section 099123 - INTERIOR PAINTING for field painting of hoistway entrance doors and frames.

I. Section 221429 - SUMP PUMP for sump pumps, oil interceptors, sumps, and sump covers in elevator pits.

J. Division 26 for:
   1. Smoke detectors in elevator lobbies to initiate emergency recall operation and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation and for connection to elevator controllers.
   2. Providing electrical service to elevator, including fused disconnect switches.
   3. Emergency power supply, transfer switch and auxiliary contacts.
   4. Convenience outlets and illumination in Machine Room, hoistway and pit.
   5. Light outlet in the center of hoistway as indicated by the elevator contractor.
   6. Standby Power Supply Systems: emergency generator for elevator operations.
   7. Telephone Systems: ADAAG required emergency communications systems.
   8. Provision of telephone and convenience outlet on control panel.

K. Division 23: Heating, Ventilating and Air Conditioning:
   1. Heating and Ventilating of hoistways and Machine Rooms.

1.04 REGULATORY REQUIREMENTS

A. ADA Standards - Americans with Disabilities Act Accessibility Guidelines.

B. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2019, with Errata (2021).

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

D. ISO 9001 - Quality Management Systems — Requirements; 2015.

E. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

H. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

I. ICC A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.

1.05 SYSTEM DESCRIPTION

A. Application: Machine Room Less (MRL).

B. Machine Location: Top of the hoistway mounted on car and counterweight guide rails.

C. Control Space Location: Top landing entrance frame or entrance frame at one floor below the top landing.

D. Elevator Types and Performance Requirements:

1.	Quantity of Elevator:	One (1)
2.	Elevator Model:	Schindler 3300XL MRL Traction
3.	Operation System:	Microprocessor Single Car Automatic Operation
4.	Elevator Numbers:	Elevator No. No. 1
5.	Service:	Hospital Service
6.	Number of stops /opgs.	
	Elevator No. 1	Two (2) stops, Both front.
7.	Travel:	
	Elevator	15'-0"
8.	Rated Capacity:	
	All Elevators	4000 lb. capacity
9.	Speed:	
	All Elevators	150 fpm
10.	Cab Size:	
	All Elevators	5'-4 1/4" wide by 7'-8 1/2" deep
11.	Cab Heights:	All 7'-9" height nominal or as indicated.
12.	Hoistway Entrance Size:	All 4'-0" wide x 7'-0" high
13.	Door Type:	Two Speed Side-Slide
14.	Power Characteristics:	480V, 3 phase
15.	Seismic:	No
16.	Fixture and Button Style:	Stainless Steel 301 Push Buttons.
17.	Special Operations:	Fire Service Phase 1 and Fire Service Phase 2

E. Performance
   1. Car Speed: -10% to +5% of contract speed under any loading condition or direction of travel.
   2. Car Capacity: Safely lower, stop and hold up to 125% of rated load per code.

F. Ride Quality:

1.	Vertical Vibration (maximum):	25 mg
2.	Horizontal Vibration (maximum):	15 mg
3.	Vertical Jerk (maximum):	2 ft/sec^3
4.	Acceleration (maximum):	1.6 ft/sec^2
5.	In Car Noise:	53-60 dB(A)
6.	Stopping Accuracy:	±5mm
7.	Starts per hour (maximum):	180

G. Elevator Operation:
   1. Simplex Collective Operation: Using a microprocessor based controller, operation shall be automatic by means of the car and hall buttons. When all calls have been answered, the car shall park at the last landing served.
   2. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching algorithm designed to minimize passenger waiting time.

H. Operating Features - Standard:
   1. Door Light Curtain Protection
   2. Static AC Drive
   3. Phase Monitor Relay
   4. Cab Overload with Indicator
   5. Load-weighing
   6. Central Alarm
   7. Remote Monitoring
   8. Firefighter’s Operation

9. Automatic Evacuation
    a. When the main line power is lost for longer than 5 seconds the emergency battery power supply provides power automatically to the elevator controller. If the car is at a floor when the power fails, it remains at that floor, opens its doors, and shuts down. If the car is between floors, it is raised or lowered to the first available landing, opens it doors, and shuts down.
10. Independent Service

1.06 ACTION SUBMITTALS

A. Comply with Section 013300 - SUBMITTALS.

B. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.

C. Shop Drawings:
1. Include plans, elevations, sections, and large-scale details indicating service at each landing, pit and hoistway, erection and anchorage, details of assembly and coordination with building structure, relationships with other construction, and locations of equipment.
2. Include equipment arrangements in the control space, pit and hoistway.
3. Include large-scale layout of car-control station.
4. Indicate floors served, travel distances, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.
5. Indicate electrical power requirements, Horsepower, starting current, running current, machine and control heat release and branch circuit protection devices recommended.

D. Samples for Initial Selection: For finishes involving color selection such as powder coating, plastic laminates, metals and other exposed finishes requiring selection.

E. Operation and Maintenance Manual: Submit manufacturer/installer’s operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; renewal parts catalogs; and electrical wiring diagrams.

F. Warranty: Submit manufacturer/installer’s standard warranty.

1.07 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service including standby power generator, as shown and specified, are adequate for elevator system being provided.

C. Sample Warranty: For special warranty.

1.08 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals, wiring diagrams and Parts list with recommended parts inventory.
1. In addition to items specified in Section 017823 - OPERATING AND MAINTENANCE DATA include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

1.09 QUALITY ASSURANCE

A. Manufacturer Qualifications: An approved manufacturer with minimum fifteen (15) years experience in manufacturing, installing, and servicing elevators of the type required for the project.
   1. Must be the manufacturer of the power unit, controller, signal fixtures, door operators cab, entrances, and all other major parts of the elevator operating equipment.
      a. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
      b. All safety components must be certified by a qualified 3rd party certification body (ie. Safety, governor, brakes, rope grippers, ascending car protection, and door locks).
   2. The manufacturer shall have a documented, on-going quality assurance program.
   3. ISO 9001:2000 Manufacturer Certified
   4. ISO-14001:2004 Environmental Management System Certified.
   5. LEED Gold certified elevator manufacturing facility.

B. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer. Installer shall have a least fifteen (15) years of satisfactory experience installing elevators equal in scope, character and performance to the project elevators.

C. Fire-rated Entrance Assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, CAN4-S104 (ULC-S104), UL 10B, and NFPA 80. Provide entrance assembly units bearing Class B or 1 1/2 hour label by a Nationally Recognized Testing Laboratory.

D. Inspection and testing: Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.
   1. Arrange for inspections and make required tests.
   2. Deliver to the Owner upon completion and acceptance of elevator work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

B. Manufacturer will deliver elevator materials, components and equipment and the contractor is responsible to provide secure and safe storage on job site in accordance with manufacturer/installer’s instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

1.11 PROJECT CONDITIONS

A. Prohibited Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

B. General Construction Contractor shall coordinate the provisions for temporary electric and GFCI-protected electricity to be available for the installation of elevator components.

C. General Construction Contractor shall provide a temporary work platform at the top floor of the hoistway compliant with applicable codes and in accordance with the layout drawing specification provided by the approved elevator manufacturer.

1.12 COORDINATION

A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of other work relating to the elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, and pits.

C. Prohibited Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

1.13 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
   2. Warranty Period: One (1) year from date of Substantial Completion.

1.14 MAINTENANCE

A. Furnish maintenance and 24-hour, 7 days a week call back service for a period of 12 months for each elevator from date of Substantial Completion during normal working hours, excluding callbacks. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.
   1. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.
   2. Elevator maintenance service shall be performed by elevator manufacturer/installer.

B. Elevator Control System:
   1. Include built-in remote diagnostic module to relay constant status of elevators and control system to a 24-hour, 7-days-a-week central-monitoring facility.
   2. Remote Monitoring Device: Transmit information on current status of elevators, including malfunctions, system errors, and shutdown.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by Schindler Elevator Corporation, PO Box 1935, Morristown, New Jersey 07962. Phone (973) 397-6500. Website www.us.schindler.com.
   1. Architect approved equivalent.

B. Source Limitations: Obtain elevators from single manufacturer.
   1. Major elevator components, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.

C. Elevator shall be installed by elevator manufacturer or an manufacturers approved / licensed installer.

2.02 MATERIALS, GENERAL

A. All Elevator Cab materials including frame, buttons, lighting, wall and ceiling assembly, laminates and carpet shall have an EPD and an HPD and shall be as selected by the Interior Designer.

B. Colors, patterns, and finishes: As selected by the Architect or Interior Designer from manufacturer's standard colors, patterns, and finish charts.

C. Steel:
   1. Shapes and bars: Carbon.
   2. Sheet: Cold-rolled steel sheet, commercial quality, Class 1, matte finish.
   3. Finish: Factory-applied baked enamel.

D. Plastic laminate: Decorative high-pressure type, complying with NEMA LD3, Type GP-50 General Purpose Grade, nominal 0.050" thickness. Laminate selection shall be based on elevator manufacture’s standard selections.

E. Floor Finish: See Division 09 and indicated finish on the drawings.

2.03 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1.

B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

C. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator safety requirements for seismic risk Zone 1 or greater in ASME A17.1.
   1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
   2. Affected peak velocity acceleration (Av) for Project's location is greater than or equal to 0.10, but less than 0.20.
   3. Provide earthquake equipment required by ASME A17.1.
   4. Provide seismic switch required by ASCE/SEI 7.

5. Elevator Component Importance Factor: 1.5.

2.04 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microprocessor based control system to perform all of the functions of safe elevator operation, as well as perform car and group operational control.
   1. All high voltage (110v or above) contact points inside the inspection and test panel shall be protected from accidental contact in a situation where the access panels are open.
   2. The controller shall be distributed throughout the elevator system located in the overhead, cab and inspection and test panel. The inverter will be mounted in the overhead adjacent to the hoist machine and an inspection and test panel will be located in the door jamb at the top floor or one floor below the top floor. No elevator equipment mechanical rooms or closets are required.
   3. Provide multi-bus control architecture to reduce cabling, material and waste.

B. Drive: Provide a Variable Voltage Variable Frequency AC Closed Loop drive system. Provide stable start without high peak current, quickly reaching a low energy consumption level.

C. Inspection and Test Panel: Integrated control equipment, main inspection and test panel in door frame at top level served or at one floor below the top level served.

2.05 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine:
   1. Gearless asynchronous AC motor with integral drive sheave, service and emergency brakes.
   2. Design machine to enable direct power transfer, thereby avoiding loss of power.
   3. Design machine to be compact, lightweight and durable to optimize material usage and save space.
   4. Mount to structural support channels on top of guide rail system as applicable in hoistway overhead.

B. Governor:
   1. Tension type over-speed governor with remote manual reset.
   2. Mount to structural support channels as applicable in hoistway overhead.

C. Buffers, Car and Counterweight: Compression spring type buffers to meet code.

D. Hoistway Operating Devices:
   1. Emergency Stop switch in the pit.
   2. Terminal stopping switches.
   3. Emergency stop switch on the machine.

E. Positioning System: System consisting of proximity sensors and door zone vanes.

F. Guide Rails and Attachments: Provide Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.

G. Suspension System: Non circular Elastomeric coated suspension media with high tensile grade steel cords.

H. Governor rope: Steel wire rope with 6 mm diameter.

2.06 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Doors and Frames:
   1. UL rated with required fire rating.
   2. Doors: Rigid flush panel construction with reinforcement ribs.
   3. Frames: Securely fasten at corners to form unit frame. Frames shall be bolted.

B. Finish:
   1. Exposed Areas of Corridor Frames: Stainless Steel - All Floors
   2. Doors: Stainless Steel - All Floors
   3. Sills: Aluminum - All Floors

C. Entrance Markings and Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.07 EQUIPMENT: CAR COMPONENTS

A. Car Frame and Safety: Provide car frame with adequate bracing to support the platform and car enclosure. The safety shall be integral to the car frame and shall be flexible guide clamp type.

B. Platform: Provide platform of steel construction with plywood subfloor and aluminum threshold.

C. Car Guides: Provide sliding guide shoes mounted to top and bottom of both car and counterweight frame. Arrange each guide shoe assembly to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

D. Provide central guiding system to reduce mechanical friction and energy consumption.

E. Steel Cab:
   1. Fire rating: Provide Class B fire rating for cab, or Class A fire rating where required by local Code.
   2. Design cab to comply with LEED Indoor Environmental Quality requirements through use of Low-Emitting Materials on walls, ceiling and subflooring.
   3. Car wall finish: #4 Brushed Stainless Steel.
   4. Base and frieze: Aluminum.
   5. Car front finish: #4 Brushed Stainless Steel.
   6. Car door finish: #4 Brushed Stainless Steel.
   7. Ceiling: Canopy ceiling, Down light type, Stainless Steel metal pans with suspended LED down lights.
   8. Handrail: Provide 1/2 inch x 2 inch Flat Bar on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails shall have a #4 Brushed Stainless Steel.
   9. Flooring: By others. Not to exceed 3/8” finished depth.
   10. Ventilation: Provide one-speed fan in canopy.
   11. Emergency Car Lighting: Provide an emergency power unit employing a 12 volt sealed rechargeable battery and static circuits to illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
   12. Emergency Siren: Provide siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged.
   13. Emergency Exit Switch: Provide an electrical contact to open the safety circuit when the emergency car top exit is opened. When the exit door is opened, the top exit switch shall signal the control and the car will be unable to move.
   14. Emergency Exit Lock: Provide an emergency exit lock where required by local code.

15. Emergency Exit Guard: Provide emergency exit guard on top of car when required for hoistway wall to platform clearance exceeds 12” or for multiple cars in hoistway.

2.08 DOOR OPERATOR AND REOPENING DEVICES

A. Door Operator: Provide a closed loop VVVF high performance door operator with frequency controlled drive for fast and reliable operation to open and close the car and hoistway doors simultaneously.

B. In case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Provide emergency devices and keys for opening doors from the landing as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. Provide door open button in the car operating panel. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Provide door hangers and tracks for each car and hoistway door. Contour tracks to match the hanger sheaves. Design hangers for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed for life bearings.

E. Electronic Door Safety Device: Equip car doors with concealed transmitter and receiver infrared beam devices to detect presence of object in process of passing through hoistway entrance and car doorway (light curtain device).
   1. Use multi-beam scanning without moving parts to detect obstructions in door opening.
   2. Detector Device: Prevent doors from closing, or if they have already started closing, cause doors to reopen and remain open while object is within detection zone.
   3. Horizontal Beams: Minimum of 33 infra red beams to fill doorway from ground level to a height of 6 feet.

2.09 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide a car operating panel with all push buttons, key switches and message indicators for elevator operation.
   1. Full height car operating panel shall be surface-mounted on front return.
   2. Comply with handicap requirements.
   3. Push Buttons: Mechanical, illuminating using long-lasting LEDs for each floor served.
   4. Emergency Buttons: Provide in accordance with code. Emergency alarm button, door open and door close buttons.

B. Features of the Car Operating Panel Shall Include:
   1. Audible chime to signal that the car is either stopping at or passing a floor served by the elevator.
   2. Raised markings and Braille provided to the left hand side of each push button.
   3. Car Lantern: Provide LED illuminated car lantern with direction arrows to comply with local code when hall lanterns are not provided.
   4. Door open and close push buttons.
   5. Firefighter’s hat and Phase 2 Key-switch
   6. Inspection key-switch.
   7. Key-switch for optional Independent Service Operation
   8. Illuminated alarm button with raised marking.
   9. Elevator Data Plate marked with elevator capacity and car number.
   10. Help Button: Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered,

where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.

C. Hall Fixtures: Provide hall fixtures with necessary push buttons and key switches for elevator operation.
   1. Push buttons: Metallic tactile push buttons, up button and down button at intermediate floors, single button at each terminal floor.
   2. Height: Comply with handicap requirements.
   3. Illumination: Illuminating using long-lasting low power LEDs.

D. Hall Lanterns and Position Indicators.
   1. LED illuminated direction arrows with audible and visible call acknowledgement.

E. Hoistway access switches: Provide key-switch at top and/or bottom floor in entrance jamb as required by local code.

F. Firefighter’s Phase 1 Service: Key switch in brushed stainless steel cover plate.

G. Fixture Cover Plates: For push buttons, hall lanterns and position indicators, resistant white back-printed glass, no screws required for mounting. Provide stainless steel cover plates for Firefighter's Phase I switch and hoistway access switches, with tamper resistant screws in same finish.

H. Mounting: Mount hall fixtures in entrance frames.

2.10 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.

B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.11 FINISH MATERIALS

A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.

B. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel, Type B, exposed, matte finish.

C. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, commercial steel, Type B, pickled.

D. Stainless-Steel Sheet: ASTM A240/A240M, Type 304.

E. Stainless-Steel Bars: ASTM A276/A276M, Type 304.

F. Stainless-Steel Tubing: ASTM A554, Grade MT 304.

G. Aluminum Extrusions: ASTM B221, Alloy 6063.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Before starting elevator installation, inspect hoistway, hoistway openings, pits and machine rooms/control space, as constructed and verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Verify hoistway is clear and plumb, with variations not to exceed -0 to +1 inch at any point. Verify projections greater than 4” must be beveled not less than 75 degrees from horizontal. No negative tolerance is permitted for minimum hoistway dimensions.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

A. Install elevator systems components and coordinate installation of hoistway wall construction.
   1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.
   2. Comply with the National Electrical Code for electrical work required during installation.

B. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.

C. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum safe, workable dimensions at each landing. Verify hoistway is clear and plumb, with variations not to exceed -0 to +1 inch at any point. Verify projections greater than 4” must be beveled not less than 75 degrees from horizontal. No negative tolerance is permitted for minimum hoistway dimensions.

D. Lubricate operating parts of systems as recommended by manufacturers.

E. Leveling Tolerance: 1/4 inch, up or down, regardless of load and travel direction.

F. Set sills flush with finished floor surface at landing. Fill space under sill solidly with non-shrink, nonmetallic grout.

G. Locate hall signal equipment for elevators as follows, unless otherwise indicated:
   1. Place hall lanterns either above or beside each hoistway entrance.
   2. Mount hall lanterns at a minimum of 72 inches above finished floor.

3.03 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.04 ADJUSTING

A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

B. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.

C. Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.

D. Adjust automatic floor leveling feature at each floor to within 1/4 inch of landing.

3.05 PROTECTION

A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with the following requirements for elevator used for construction purposes:
   1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
   2. Provide strippable protective film on entrance and car doors and frames.
   3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
   4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
   5. Do not load elevators beyond their rated weight capacity.
   6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
   7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

B. At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.06 DEMONSTRATION

A. Instruct Owner's personnel in proper use, operations, adjustments, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions, adjusting and maintaining.

B. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

C. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

3.07 CLEANING

A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless stall shall be cleaned with soap and water and dried with a non-abrasive surface; shall not be cleaned with bleached-based cleansers.

B. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoist way. Remove trash and debris.

3.08 MAINTENANCE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 18 months full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
   1. Perform maintenance during normal working hours.
   2. Perform emergency callback service during normal working hours with response time of two hours or less.
   3. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Work specified as part of this Section consists of the work required to achieve operational and coordinated Sequences of Operation as described. Work includes coordination of functions of controllers supplied as part of equipment packages, sizing of control valves, interconnection of systems, provision and installation of all accessory devices required for complete system operation including devices not provided as part of equipment, coordination of start up and testing and demonstration of the operation of Sequences of Operation to the Owner and his representatives.

B. The control system operation of all equipment shall be subject to the operational modes, conditions and logic described in this Section and the controlled equipment manufacturer's recommendations.

C. Training of the Owner's personnel in the operation, trouble shooting, adjustment and repair of all system controls.

1.02 RELATED SECTIONS AND WORK

A. Section 230923 - Automatic Temperature Controls and Building Automation System

B. Section 230991 - Instrumentation and Control Integration

C. Division 26 - Electrical Specifications

D. Owner's Building Management System (BMS)

E. Owner's Fire Alarm System (FAS)

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 GENERAL

A. General
   1. Conform to the requirements of the Owner's standards for all electrical work and devices.
   2. System and system components shall be BACNet compatible.
   3. All set points and operating points shall be able to be transmitted to and set from the BMS system. Specific points to be enabled shall be at the discretion of the Owner.
   4. All systems shall be capable of operating independently of the BMS system based on set points and limits either input from the BMS system or manually.
   5. Coordinate all work with the requirements and characteristics of the BMS system and the equipment provided for the project under this phase or earlier phases.
   6. All space sensors and thermostats shall have an LCD display indicating their set point, the condition sensed and the mode of operation they are responding to.
   7. All equipment to be integrated with the BMS shall be fully integrated with new or existing facility controls and devices including interlocks, icons, graphics, read-outs and reports.

3.02 SEQUENCE OF OPERATION - EXHAUST FANS, TE-X

A. General:

1. The exhaust fan shall run continuously 24 hours a day, 7 days a week.

3.03 SEQUENCE OF OPERATION - SPLIT SYSTEM DEDICATED OUTDOOR AIR UNIT, DOAS-1/DOAS-2

A. Run Conditions - Scheduled:
   1. The unit shall run according to a user definable time schedule.

B. Outside Air Damper:
   1. The outside air damper shall open anytime the unit runs and shall close anytime the unit stops. The supply fan shall start only after the damper status has proven the damper is open.
   2. The outside air damper shall close 4sec (adj.) after the supply fan stops.
   3. Alarms shall be provided as follows:
      a. Outside Air Damper Failure: Commanded open, but the status is closed.
      b. Outside Air Damper in Hand: Commanded closed, but the status is open.

C. Supply Fan:
   1. The supply fan shall run anytime the unit is commanded to run. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime, unless shutdown on safeties.
   2. Alarms shall be provided as follows:
      a. Supply Fan Failure: Commanded on, but the status is off.

D. Zone Temperature Control:
   1. The controller shall monitor the supply air temperature and shall maintain a supply air temperature of 70 degrees.

E. Hot Gas Reheat Mode:
   1. When the supply fan is running and the unit is in Cooling mode the system monitors the leaving air temperature.
   2. The leaving air temperature will typically be within approximately ± 0.5 degree F of the leaving air temperature set point.
   3. If the leaving air temperature is greater than 72 degree F, then the hot gas reheat mode will be disabled.

F. Dehumidification:
   1. If the leaving air temperature set point is achieved, the controller will check leaving air humidity.
   2. If the leaving air humidity is 3% above the leaving air humidity set point, 60% RH, the digital compressor will ramp up in capacity as necessary to satisfy the leaving air humidity set point.
   3. If the leaving air temperature goes below the set point, modulating hot gas reheat will be enabled to maintain the leaving air temperature. The controlled will balance the capacity of the compressor and the use of hot gas reheat to first satisfy leaving air temperature and then, if necessary dehumidify.

G. Prefilter Status:
   1. The controller shall monitor the prefilter status.
   2. Alarms shall be provided as follows:
      a. Prefilter Change Required: Prefilter differential pressure exceeds a user definable limit (adj.).

H. Supply Air Temperature:
   1. The controller shall monitor the supply air temperature.
   2. Alarms shall be provided as follows:

a. High Supply Air Temp: If the supply air temperature is greater than 120 degree F (adj.).
b. Low Supply Air Temp: If the supply air temperature is less than 45 degree F (adj.).

I. System Points

	Hardware Points				Software Points						
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Supply Air Temp	x								x		x
Modulating Gas Heat		x							x		x
Outside Air Damper Status			x						x		x
Supply Fan Status			x						x		x
Prefilter Status			x						x		
Outside Air Damper				x					x		x
Supply Fan Start/Stop				x					x		x
Cooling Stage 1				x					x		x
Cooling Stage 2				x					x		x
Supply Air Temp Set Point					x				x		x
Outside Air Damper Failure										x	
Supply Fan Failure										x	
High Supply Air Temp										x	
Low Supply Air Temp										x	
Totals	**1**	**1**	**3**	**4**	**1**	**0**	**0**	**0**	**10**	**4**	9

Total Hardware (12) **Total Software (18)**

3.04 SEQUENCE OF OPERATION - VARIABLE REFRIGERANT FLOW (VRF) UNITS

A. Cooling Operation:
1. The unitary controller will call for cooling when measured room temperature is 1.8FDB above setpoint and adjust refrigerant flow and capacity based on differential from setpoint. The unit will remain in an active call for cooling until the measured room temperature is 1.8FDB below setpoint.
2. The indoor fan will operate based on user selected fan speed setting at the unitary controller and will allow for High, Medium, and Low selection. The fan speed will remain constant in the cooling mode regardless of the cooling cycle being called for.
3. (User fan speed control should be disabled in applications where OA is ducted into the terminal unit)

B. Heating Operation
1. The unitary controller will call for heating when measured room temperature is 1.8FDB below setpoint and adjust refrigerant flow and capacity based on differential from setpoint. The unit will remain in an active call for heating until the measured room temperature is 1.8FDB above setpoint.
2. The indoor fan will operate based on user selected fan speed setting at the unitary controller and will allow for High, Medium, and Low selection. The fan speed will remain constant during heating/and or cooling operation.

C. Mode Changeover
   1. Mode changeover shall be configured through the Building Management System controller.

END OF SECTION 230993

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Remove and dispose of surface debris as required.

B. Remove and dispose of paving, sidewalk, curbs, etc.

C. Clear site or designated areas of the site of plant life and grass as required, and dispose of as required.

D. Remove and dispose of trees and shrubs as required.

E. Remove and dispose of stumps and root system of trees and shrubs as required.

F. Removal and storage of topsoil.

1.02 RELATED SECTIONS

A. Section 312213 - Rough Grading.

B. Section 329119.13 - Topsoil Placement and Grading: Placement of stored topsoil.

1.03 REGULATORY REQUIREMENTS

A. Conform to applicable local code(s) for disposal of debris.

B. Burning of materials on site is prohibited.

C. Coordinate clearing work with utility companies.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify existing conditions.

B. Identify existing plant life designated to be removed. Verify with Owner and Engineer prior to removal.

C. Verify limits of clearing.

3.02 PROTECTION

A. Locate, identify and protect utilities that are to remain from damage.

B. Protect trees, plant growth and features designated to remain as final landscaping.

C. Protect benchmarks and existing structures from damage or displacement. Any damage to existing structures is to be promptly repaired at no additional cost to the Owner.

3.03 APPLICATION

A. Clear areas required for access to site and execution of work.

B. Remove paving, curbs, debris and sidewalks as required.

C. Remove trees and shrubs designated to be removed. Remove stumps, main root ball, surface rock and perishable debris.

D. Clear undergrowth and dead wood without disturbing subsoil.

E. Remove paving, debris, rock and extracted plant life from site and dispose of in accordance with State and local ordinances.

F. Excavate topsoil from areas to be further excavated, re-landscaped or regraded. Do not excavate wet topsoil.

G. Stockpile topsoil in area designated on site to a height not exceeding 8 feet. Protect from erosion. Remove excess topsoil not being reused from site. Do not remove any topsoil from the site prior to obtaining the approval of the Engineer.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Removal and storage of subsoil.

B. Cutting, grading, filling and rough contouring the site prior to placement of topsoil or pavement base for final grading.

1.02 RELATED SECTIONS

A. Section 311100 - Site Clearing.

B. Section 312316 - Excavation - Removal of Unsuitable Soils.

C. Section 312323.13 - Backfill - Replacement of Unsuitable Soils.

1.03 REFERENCES

A. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18 inch Drop.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Sieve Analysis: Submit a sieve analysis of all types of fill material to be used.

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of utilities remaining, by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subsoil: Reused excavated material, graded, free of lumps, rocks and gravel larger than 3 inches in size, debris and contaminants.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify that survey benchmark and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours and datum.

B. Identify known underground, aboveground and aerial utilities. Stake and flag locations.

C. Coordinate the removal or relocation of utilities with the necessary utility companies.

D. Protect above and below-grade utilities that are to remain.

E. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.

F. Protect benchmarks, existing structures, fences, sidewalks, paving and curbs from excavation equipment and vehicular traffic.

3.03 APPLICATION

A. Excavate subsoil from areas to be further excavated or regraded. Do not excavate wet subsoil.

B. Stockpile in area designated on site. Remove excess subsoil not being reused from site.

C. Stockpile subsoil to a height not exceeding 8 feet. Cover to protect from erosion.

D. When excavation through roots is necessary, perform work by hand and cut roots with sharp axe.

E. Fill areas to contours and elevations with unfrozen subsoil material with allowances made for topsoil, aggregate base course or paving.

F. Place and compact subsoil fill material in 12 inch lifts (compacted thickness). Compact to 92 percent maximum dry density in accordance with ANSI/ASTM D1557.

G. Maintain optimum moisture content of fill materials to attain required compaction density.

H. Make grade changes gradual. Blend slope into level areas.

I. Remove surplus fill materials from site.

3.04 TOLERANCES

A. Maximum Variation From Top Surface of Subgrade: 1 inch.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform tests and analysis of fill material in accordance with ANSI/ASTM D1557.

C. Perform compaction tests at a rate of one for every 10 cubic yards of material placed.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Excavation for building foundations.

B. Excavation for slabs-on-grade, paving and landscaping.

C. Excavation for site structures.

D. Site excavation.

1.02 RELATED SECTIONS

A. Section 312213 - Rough Grading.

B. Section 312323.13 - Backill: Backfilling excavated material.

1.03 QUALITY ASSURANCE

A. Do not excavate wet or frozen materials without written approval from the Engineer.

B. Provide safety barricades around open excavations.

1.04 FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the work are as indicated.

1.05 COORDINATION

A. Coordinate work under provisions of Section 013100.

PART 2 - PRODUCTS

2.01 NOT USED.

PART 3 - EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours and datum.

B. Identify known underground, above ground and aerial utilities. Stake and flag locations.

C. Notify utility company to remove or relocate utilities, if required.

D. Protect above and below grade utilities which are to remain.

E. Protect plant life, lawns and other features remaining as a portion of final landscaping.

F. Protect bench marks, existing structures, fences, sidewalks, paving and curbs from excavation equipment and vehicular traffic.

G. Notify the Engineer prior to commencement of excavation.

3.02 EXCAVATION

A. Underpin adjacent structures that may be damaged by excavation work, including utilities and pipe chases.

B. Excavate subsoil required to accommodate landscaping and construction operations to the limits as indicated on the plans.

C. Machine slope banks to angle of repose or less, until shored.

D. Grade top perimeter of excavation to prevent surface water from draining into excavation.

E. Hand trim excavation. Remove loose matter.

F. Remove lumped subsoil, boulders, and rock.

G. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

H. Correct unauthorized excavation at no extra cost to Owner in accordance with Section 312323.

I. Stockpile excavated material in area designated on site and remove excess material not being reused from site.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Provide for visual inspection of bearing surfaces.

3.04 PROTECTION

A. Protect work under provisions of Section 015000.

B. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.

C. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

PART -1 GENERAL

1.01 SECTION INCLUDES

A. Site structure backfilling to sub-grade elevations.

B. Site filling and backfilling.

C. Consolidation and compaction.

D. Fill for over-excavation.

1.02 RELATED SECTIONS

A. Section 312316 - Excavation.

B. Section 312213 - Rough Grading.

1.03 REFERENCES

A. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-inch Drop.

B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Material Source: Submit name of imported material suppliers.

C. Provide a letter certifying that each type of imported fill material has been provided by a NYSDEC certified clean fill source or has been tested in accordance with NYSDEC Unrestricted Soil Use Guidelines as defined in Subpart 375-6 Remedial Program Soil Cleanup Objectives.

D. Test Reports: Submit sieve analysis and test results from NYSDEC Unrestricted Soil Use Guidelines for each type of imported fill to be used.

1.05 PROJECT CLOSEOUT SUBMITTALS

A. Submit under provisions of Section 017200.

B. Provide documentation on the contractor’s letterhead certifying that all fill material utilized for this project came from approved sources and met the requirements of the NYSDEC Unrestricted Program Soil Use Guidelines.

PART 2 - PRODUCTS

2.01 IMPORTED FILL SOURCE

A. All imported fill materials shall be provided by a NYSDEC certified clean fill source or meet the requirements of NYSDEC Unrestricted Soil Use Guidelines as defined in Subpart 375-6: Remedial Program Soil Cleanup Objectives.

B. Provide materials from the same source throughout the work. Change of source requires approval from the Engineer.

2.02 FILL MATERIALS

A. Coarse Aggregate: Angular crushed or natural stone; washed, free of shale, clay, friable material, sand and debris; graded in accordance with ASTM D2487 Group Symbol GW or GP within the following limits

1. Sieve Size	Percent Passing
a. 1 1/2 inch	100
b. 1 inch	90 - 100
c. 1/2 inch	0 - 15
d. No. 200	0 - 1

B. Sand: Natural river or bank sand; washed, free of silt, clay, loam, friable or soluble materials, or organic matter; graded in accordance with ASTM D2487 Group Symbol SW or SP, within the following limits:

1. Sieve Size	Percent Passing
a. No. 4	100
b. No. 14	0 - 100
c. No. 50	5 - 90
d. No. 100	4 - 30
e. No. 200	0

C. Subsoil: Reused, excavated material, graded, free of lumps, rocks and gravel larger than 3 inches in size, debris and contaminants; no more than 15% passing the No. 200 sieve; no more than 30% retained on the ¾" sieve.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify fill materials to be reused are acceptable.

C. Verify items to be buried during backfilling process have been inspected prior to backfilling.

3.02 PREPARATION

A. Compact subgrade to 92 percent maximum dry density in accordance with ANSI/ASTM D1557.

B. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with sand or subsoil and compact to density equal to or greater than requirements for subsequent backfill material.

3.03 BACKFILLING

A. Backfill areas to contours and elevations with unfrozen materials.

B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy materials.

C. Place and compact fill material in 12 inch lifts (compacted thickness). Compact to 92 percent maximum dry density in accordance with ANSI/ASTM D1557.

D. Employ a placement method that does not disturb or damage structures or other items against which material is backfilled.

E. Backfill against supported structures. Do not backfill against unsupported structures.

F. Backfill simultaneously on each side of structure.

G. Make grade changes gradual. Blend slope into level areas.

H. Remove surplus backfill materials from site.

I. Leave fill material stockpile areas completely free of excess fill materials.

3.04 TOLERANCES

A. Maximum Variation From Top Surface of Backfilling Under Paved Areas: 1/4 inch.

B. Maximum Variation From Top Surface of General Backfilling: 1 inch.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform field tests and analysis of fill material in accordance with ANSI/ASTM D1557.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

D. Unless additional testing is required by the Engineer, compaction tests shall be taken at the following rates:
   1. Pavement Subgrade: One test per 5,000 square feet of subgrade immediately prior to placing subbase.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Excavate trenches for piping and utilities.

B. Compacted bedding and backfill around and over piping and utilities to subgrade elevations.

C. Backfilling and compaction.

1.02 RELATED SECTIONS

A. Section 312213 - Rough Grading: Topsoil removal from site surface.

1.03 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb Rammer and 18-inch Drop.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Test Reports: Submit a sieve analysis for backfill to be used.

1.05 QUALITY ASSURANCE

A. Do not excavate wet or frozen materials without written approval from the Engineer.

B. Do not backfill over or with wet or frozen materials.

C. Provide safety barricades around open excavations.

1.06 FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the work are as shown on plans.

1.07 COORDINATION

A. Coordinate work under provisions of Section 013100.

B. Coordinate trenching with installation of pipe or conduit.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subsoil: Reused, excavated material, graded, free of lumps, rocks and gravel larger than 3 inches in size, debris and contaminants.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing site conditions and substrate.

B. Verify fill materials to be reused are acceptable.

C. Verify items to be buried during backfilling process have been inspected prior to backfilling.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Maintain and protect existing utilities remaining which pass through work area.

C. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.

D. Protect benchmarks, existing structures, fences, sidewalks, paving and curbs from excavation equipment and vehicular traffic. Any item damaged by the contractor shall be promptly repaired at the contractor's expense.

E. Protect above and below grade utilities which are to remain.

F. Cut out soft areas of subgrade not capable of in situ compaction. Backfill with subsoil fill and compact to density equal to or greater than requirements for subsequent backfill material.

3.03 EXCAVATION

A. Excavate subsoil required for piping.

B. Cut trenches to the dimensions shown on the plans.

C. Excavation shall not interfere with normal 45 degree bearing splay of foundations.

D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

E. Remove lumped subsoil, boulders, and rock.

F. For trenches made in solid rock, excavate to a depth of 1 foot below the proposed pipe invert.

G. Correct unauthorized excavation at no cost to Owner in accordance with Section 312323.13.

H. Stockpile excavated material in area designated on site and remove excess material not being used from site. Remove excavated material from site.

3.04 BACKFILLING

A. Support pipe and conduit during placement and compaction of fill material.

B. For trenches made in solid rock, place an additional 1 foot of fill material under pipe or conduit.

C. Place fill material to the dimensions and limits as shown on the plans.

D. Place and compact fill material in 12 inch lifts (compacted thickness) for depths greater than 2 feet and 6 inch lifts (compacted thickness) for depths less than 2 feet. Compact to 92 percent maximum dry density in accordance with ANSI/ASTM D1557.

E. Place fill material simultaneously on both sides of the pipe or conduit. Backfill to the dimensions and limits shown on the plans with reused subsoil.

F. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

G. Place and compact material in continuous layers not exceeding 6 inches compacted depth.

H. Employ a placement method that does not disturb or damage conduit or pipe.

3.05 TOLERANCES

A. Maximum Variation From Top Surface of Backfilling Under Paved Areas: 1/4 inch.

B. Maximum Variation From Top Surface of General Backfilling: 1 inch.

3.06 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Perform field tests and analysis of fill material in accordance with ANSI/ASTM D1557.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

D. Unless additional testing is required by the Engineer, compaction tests shall be taken at the springline of the pipe and after each lift at 100 foot intervals along the pipe run.

3.07 CLEANING

A. Remove surplus backfill materials from site.

B. Leave fill material stockpile areas completely free of excess fill materials.

3.08 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Recompact fills subjected to vehicular traffic.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Paving aggregates.

1.02 REFERENCE STANDARDS

A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2019.

B. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

C. NYSDOT Standard Specifications Section 703-02.

D. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).

1.03 DELIVERY, STORAGE, AND HANDLING

A. Aggregate Storage, General:
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Course: Angular, crushed, recycled concrete; free of shale, clay, friable materials and debris; graded in accordance with ANSI/ASTM C136 within the following limits:

#	Sieve Size	% Passing
1	2"	90-100
2	1/4"	30-65
3	No. 40	5-40
4	No. 200	0-10

B. Material retained on the 1/2 inch (13 mm) sieve is coarse aggregate.

C. Coarse aggregate shall not have more than 10 percent by weight of flat or elongated pieces. A flat or elongated piece is defined as being three times greater in the largest dimension as compared to its least dimension.

D. The portion of the aggregate base course which passes the No. 40 (0.30 mm) screen shall have a plasticity index of one as tested in accordance with ASTM D4318.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. Place aggregate in maximum 3 inch (75 mm) layers and roller compact to 95% maximum dry density in accordance with ANSI/ASTM D1557.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

D. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

E. New pavement must be placed on properly compacted aggregate base course within 24 hours of final compaction. If aggregate base course is left open for more than 24 hours, re-compact and retest in accordance with ANSI/ASTM D1557.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch (6.4 mm) measured with 10 foot (3 m) straight edge.

B. Scheduled Compacted Thickness: Within 1/4 inch (6.4 mm).

C. Variation From Design Elevation: Within 1/2 inch (12.8 mm).

3.05 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Asphaltic concrete paving; wearing, binder or base course.

1.02 RELATED SECTIONS

A. Section 321123.16 - Recycled Concrete Aggregate Base Course.

1.03 REFERENCES

A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

B. AI MS-8 - Asphalt Paving Manual.

C. ASTM D242 - Mineral Filler for Bituminous Paving Mixtures.

D. ASTM D546 - Test Method for Sieve Analysis of Mineral Filler for Road and Paving Materials.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Supplier: Submit name of asphalt supplier to be used on the project prior to placement of any asphalt on the project.

C. Design Data: Submit asphalt mix design for each asphalt type to be used.

D. Testing Firm: Submit name of testing firm to be performing tests on asphalt pavement.

1.05 QUALITY ASSURANCE

A. Obtain materials from the same supplier throughout the duration of the project.

B. Do not alter from mix design requirements.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Deliver asphalt in sealed, metal containers covered with suitable material to protect the asphalt from the elements.

C. Lightly lubricate the inside surface of the container with a thin oil or soap solution before loading asphalt.

D. All containers must be cleaned of all foreign materials prior to loading.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt when base surface temperature is less than 40 degrees F, or if surface is wet or frozen.

B. Do not place asphalt when precipitation is occurring.

PART 2 - PRODUCTS

2.01 2.01 - MATERIALS

A. Asphalt Cement: AC-20; homogeneous, and shall not foam when heated to 347 degrees F.

B. Fine Aggregate: Material passing the 1/8 inch sieve; natural sand of hard, strong, durable particles which are free from coatings or injurious amounts of clay, loam or other deleterious substances.

C. Coarse Aggregate: Material retained on the 1/8 inch sieve; crushed stone or gravel; clean, durable, sharp angled fragments of rock of uniform quality.

D. Mineral Filler: ASTM D242, finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter; 100 percent shall pass the No. 30 sieve; a minimum of 85 percent shall pass the No. 80 sieve; and a minimum of 65 percent shall pass the No. 200 sieve as measured in accordance with ASTM D546.

2.02 2.02 - EQUIPMENT

A. Rollers: Minimum weight of 10 tons; equipped with lubricating devices for the roller wheels.

B. Pavers: Equipped with a vibratory device.

2.03 2.03 - ACCESSORIES

A. Tack Coat: Homogeneous, medium curing, liquid asphalt.

B. Wheel Lubricant: Oil-water mixture containing maximum 10 percent lubricating oil.

2.04 2.04 - MIXES

A. Use dry material to avoid foaming. Mix uniformly.

B. Base Course: NYSDOT Type 1; 4.0 to 6.0 percent of asphalt cement by weight in mixture in accordance with the following gradation:

SIEVE SIZE	PERCENT PASSING
2 INCHES	100
1 ½ INCHES	90-100
1 INCH	78-95
½ INCH	57-84
¼ INCH	40-72
1/8 INCH	26-57
NO. 20	12-36
NO. 40	8-25
NO. 80	4-16
NO. 200	2-8

A. Binder Course: NYSDOT Type 3; 4.5 to 6.5 percent of asphalt cement by weight in mixture in accordance with the following gradation:

Sieve Size	Percent Passing

1-1/2 inches	100
1 inch	95-100
1/2 inch	70-90
1/4 inch	48-74
1/8 inch	32-62
No. 20	15-39
No. 40	8-27
No. 80	4-16
No. 200	2-8

B. Wearing Course: NYSDOT Type 6; 5.8 to 7.0 percent of asphalt cement by weight in mixture in accordance with the following gradation:

Sieve Size	Percent Passing
1 inch	100
1/2 inch	95-100
1/4 inch	65-85
1/8 inch	36-65
No. 20	15-39
No. 40	8-27
No. 80	4-16
No. 200	3-6

2.05 SOURCE QUALITY CONTROL

A. Obtain asphalt materials from same source throughout the project.

B. Provide asphalt in accordance with the approved mix design for each type of asphalt.

C. Test samples in accordance with AI MS-2.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify that compacted subbase is dry and ready to receive work of this section.

C. Verify gradients and elevations of base are correct.

D. Verify that all castings are properly installed and are at the correct elevations.

E. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Apply tack coat at uniform rate of 0.03 to 0.07 gal/sq. yd. to contact surfaces of castings, curbs, gutters and any asphalt or concrete material.

B. Do not apply tack coat to wet or frozen surfaces.

C. Coat top surfaces of castings with oil to prevent bond with asphalt pavement.

3.03 INSTALLATION

A. Install work in accordance with AI MS-8.

B. Maintain asphalt temperature between 250 and 325 degrees F during placement.

C. Place asphalt within 24 hours of applying tack coat.

D. Place asphalt to compacted thicknesses as identified on plans. If a multiple course pavement is to be used, place top course within 24 hours of placing bottom course. If more than 24 hours elapse, a tack coat will be required to be placed over the entire surface of the bottom course prior to any additional paving.

E. Utilize the vibratory device on the paver at all times.

F. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

G. Compact pavement to a minimum of 94% maximum density.

H. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

I. Seal all joints between new pavement and existing pavement with asphalt cement.

3.04 TOLERANCES

A. Maximum Variation From Flatness: 1/8 inch measured with 10 foot straight edge.

B. Maximum Variation From Scheduled Compacted Thickness: 1/8 inch.

C. Maximum Variation from True Elevation: 1/4 inch.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Take samples and perform tests in accordance with AI MS-2.

C. Test are to include percent compaction, gradation and asphalt content.

D. Provide an asphalt thermometer for determining the asphalt temperature during paving operations.

E. Frequency of Tests: One test for every 1,000 square feet of each pavement course.

3.06 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Immediately after placement, protect pavement from mechanical injury until project is accepted by the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks, handicap ramps, driveway aprons.

B. Formwork.

1.02 RELATED SECTIONS

A. Section 312213 - Rough Grading: Preparation of subgrade for sidewalk placement.

B. Section 321123 - Aggregate Base Course

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

C. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

D. ASTM C33 - Concrete Aggregates.

E. ASTM C94 - Ready Mix Concrete.

F. ASTM C150 - Portland Cement

G. ASTM C260 - Air-Entraining Admixtures for Concrete.

H. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

I. ASTM C494 - Chemical Admixtures for Concrete.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on joint filler, admixtures and curing compounds.

C. Supplier: Submit name of concrete supplier prior to the placement of any concrete on the project.

D. Design Data: Provide a design mix for each type of concrete to be used on the project.

E. Certificates: Submit receipts of all concrete deliveries, indicating source, date, contractor, amount of concrete, concrete strength, truck number and time load was batched.

F. Testing Firm: Submit name of testing firm to be performing tests on concrete.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017839.

B. Accurately record locations of each day's concrete pour.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Obtain concrete only from approved suppliers and maintain the same source throughout the project.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Deliver concrete in accordance with ASTM C94, Alternative No. 2.

C. Place all concrete within 90 minutes of time load was batched.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when base surface temperature is less than 40 degrees F, or if surface is wet or frozen.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement: ASTM C150, air entraining, Type 1A Portland, gray color.

B. Aggregates: ASTM C33.

C. Water: Potable and not detrimental to concrete.

D. Reinforcement: ANSI/ASTM A185 plain welded steel wire fabric; in flat sheets; epoxy finish.

2.02 ACCESSORIES

A. Forms: Douglas Fir plywood type; solid, sound, undamaged sheets.

B. Joint Filler: ANSI/ASTM D1751; 1/2 inch thick.

C. Air Entraining Admixture: ASTM C260.

D. Chemical Admixture: ASTM C494, type as required.

E. Curing Compound: ASTM C309, Type 1, Class A.

F. Form Release Agent: Colorless material which will not stain concrete or absorb moisture.

G. Detectable Warning Surface: SAFTI-TRAX Mats or equal.

H. Joint Sealant: ASTM C920,,Type M, Grade P; SL-2 by Sonneborn or equal.

2.03 MIXES

A. Concrete shall be mixed and prepared in accordance with the approved mix design and ASTM C94, Alternative No. 2.

B. The mix shall be such that the concrete shall attain the following characteristics:

1. Compressive Strength (28 days): 4,000 psi.
2. Slump: 2½ to 3½ inches.
3. Air Entrainment: 6% ±1%.

C. Use chemical admixtures only when approved by the Engineer. Use of admixtures will not relax placement requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify datum and all elevations are as indicated on the plans.

C. Verify compacted granular subbase has been properly prepared and is ready to receive work of this section.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Compact base to minimum 95 percent maximum dry density in accordance with ANSI/ASTM D1557.

B. Moisten base to a minimum depth of 1/2 inch to minimize absorption of water from fresh concrete.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with concrete pavement.

D. Place and secure forms to correct location, dimension and profile.

E. Assemble formwork to permit easy stripping and dismantling without damaging concrete. Coat forms with form release agent.

3.03 INSTALLATION

A. Place joint filler vertical in position in straight lines. Secure to formwork during concrete placement.

B. Place reinforcement as indicated on the plans. Interrupt reinforcement at expansion joints.

C. Place concrete in accordance with ACI 301.

D. Ensure reinforcement and formed joints are not disturbed during concrete placement.

E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that joints occur.

F. Vibrate concrete adjacent to forms.

G. Place concrete to pattern indicated.

H. Place expansion joints with joint filler at 20 foot intervals.

I. Place scored contraction joints at 4 foot intervals.

J. Place joint filler between paving components and building or other appurtenances and in expansion joints.

K. Apply a light broom finish perpendicular to traffic.

L. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing shall be performed under provisions of Section 014500.

B. Take six concrete test cylinders for every 50 cu. yds. or fraction thereof of each class of concrete placed each day.

C. Cure test cylinders on site under same conditions as concrete sidewalk.

D. Take one slump test for each set of test cylinders taken.

E. Concrete not meeting slump requirements will be rejected.

F. Concrete represented by cylinders which do not meet required strength will be removed and replaced at no additional cost to the Owner.

3.05 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Immediately after placement, protect sidewalk from premature drying, excessive temperatures and mechanical injury.

C. Protect sidewalk from damage until project is accepted by the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Reinforced concrete curb.

B. Formwork.

1.02 RELATED SECTIONS

A. Section 312000 - Earth Moving.

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

C. ASTM A615 - Deformed and Plain Billet Steel for Concrete Reinforcement.

D. ASTM C33 - Concrete Aggregates.

E. ASTM C94 - Ready Mix Concrete.

F. ASTM C150 - Portland Cement

G. ASTM C260 - Air-Entraining Admixtures for Concrete.

H. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

I. ASTM C494 - Chemical Admixtures for Concrete.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on joint filler, admixtures and curing compounds.

C. Supplier: Submit name of concrete supplier prior to the placement of any concrete on the project.

D. Design Data: Provide a design mix for concrete to be used on the project.

E. Certificates: Submit receipts of all concrete deliveries, indicating source, date, contractor, amount of concrete, concrete strength, truck number and time truck load was batched.

F. Testing Firm: Submit name of testing firm to be performing tests on concrete.

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record locations of each day's concrete pours.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Obtain concrete only from approved suppliers and maintain the same source throughout the project.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver concrete in accordance with ASTM C94, Alternative No. 2.

B. Place all concrete within 90 minutes of time load was batched.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when base surface temperature is less than 40 degrees, or if surface is wet or frozen.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement: ASTM C150, Type 1 Portland, gray color.

B. Aggregates: ASTM C33.

C. Water: Potable and not detrimental to concrete.

D. Reinforcement: ANSI A615 steel; 60 ksi yield grade; deformed billet steel bars; uncoated finish.

E. Dowels: ASTM A615 steel; 60 ksi yield grade; plain steel, uncoated finish.

2.02 ACCESSORIES

A. Steel Forms: Minimum 16 gauge thick, stiffened to support weight of concrete with a minimum deflection.

B. Wood Forms: Douglas Fir species; solid, sound, undamaged sheets; minimum 2 inches (50 mm) thick.

C. Joint Filler: ANSI/ASTM D1751; 1/2 inch thick.

D. Air Entraining Admixture: ASTM C260.

E. Chemical Admixture: ASTM C494, type as required.

F. Curing Compound: ASTM C309, Type 1, Class A.

G. Form Release Agent: Colorless material which will not stain concrete or absorb moisture.

H. Joint Sealant: ASTM C920, Type S, Grade NS; NP-1 by Sonneborn or equal.

2.03 MIXES

A. Concrete shall be mixed and prepared in accordance with the approved mix design and ASTM C94, Alternative No. 2.

B. The mix shall be such that the concrete shall attain the following characteristics:
   1. Compressive Strength (28 days): 4,000 psi.
   2. Slump: 2½ to 3½ inches.

3. Air Entrainment: 6% ±1%.

C. Use chemical admixtures only when approved by the Engineer. Use of admixtures will not relax placement requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify datum and all elevations are as indicated on the plans.

C. Verify compacted granular subbase has been properly prepared and is ready to receive work of this section.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Excavate to the required depth and compact surface.

B. Place and secure forms to correct location, dimension and profile.

C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

D. Moisten base to a minimum depth of 1/2 inch to minimize absorption of water from fresh concrete.

E. Coat forms with form release agent.

3.03 INSTALLATION

A. Place joint filler vertical in position and at equal spaces not exceeding 20 feet. Secure to formwork during concrete placement.

B. Place dowels through joint filler as indicated on the plans. One end of dowel is to be greased or set in a capped sleeve to allow longitudinal movement.

C. Place reinforcement as indicated on the plans. Interrupt at expansion joints.

D. Place concrete in accordance with ACI 301.

E. Ensure reinforcement, dowels, joint filler or forms are not disturbed during concrete placement.

F. Place concrete continuously between construction joints. Do not break or interrupt successive pours such that cold joints occur.

G. Vibrate concrete adjacent to forms.

H. After concrete sets, but prior to curing, remove front forms without damaging concrete and apply a light broom finish to the top and face of the curb.

I. Place curing compound on exposed surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing shall be performed under provisions of Section 014500.

B. Take six concrete test cylinders for every 50 cu. yds. or fraction thereof of concrete placed each day.

C. Cure test cylinders on site under same conditions as curb.

D. Take one slump test for each set of cylinders taken.

E. Concrete not meeting slump requirements will be rejected.

F. Concrete represented by cylinders which do not meet required strength will be removed and replaced at no additional cost to the Owner.

3.05 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Immediately after placement, protect curb from premature drying, excessive temperatures, rain and mechanical injury.

C. Protect curb from damage until project is accepted by the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Painted pavement delineation.

B. Painted pavement symbols.

1.02 REFERENCES

A. New York State Department of Transportation Standard Specifications.

1.03 SUBMITTALS

A. Submit under provisions of Section 013300 - SUBMITTALS.

B. Product Data: Provide data on paint.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500 - PRODUCT DELIVERY, STORAGE, AND HANDLING.

B. Deliver all materials to the site in their original containers.

C. Store all materials in a cool, dry place.

D. Do not expose paint to open flames or temperatures which may ignite the paint.

E. Store all materials such that the paint is not contaminated.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not apply paint when the ambient temperature is below 40 degrees F.

B. Do not apply paint to wet or frozen surfaces or when precipitation is occurring.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Paint: Flexible, non-skinning paint; homogeneous, conforming to the requirements of Section 640 of the New York State Department of Transportation Standard Specifications; color as indicated on the plans or directed by Engineer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that pavement is ready to receive work of this section.

B. Beginning of application means applicator accepts existing conditions.

3.02 PREPARATION

A. Remove all dirt, grease, oil or other foreign matter from pavement which might affect the bond between the pavement and the paint.

B. Remove all temporary pavement markings without causing damage to the pavement.

3.03 APPLICATION

A. Apply paint with spray type striping machines to achieve a dry film thickness of 14 mils to 16 mils at the locations and to the dimensions as indicated on the plans.

B. Symbols may be rolled or brushed onto the pavement as long as a dry film thickness of 14 mils to 16 mils is achieved.

C. All stripes and symbols shall have clean, sharp edges.

3.04 TOLERANCES

A. Maximum offset from true position: 1 inch.

3.05 CLEANING

A. Clean adjacent areas which received paint during work of this section.

3.06 PROTECTION

A. Protect finished work under provisions of Section 015000 - TEMPORARY FACILITIES AND CONTROLS.

B. Protect painted markings from damage or discoloration until project is accepted by the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Bollards.

B. Footings and foundations.

1.02 REFERENCES

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

C. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

D. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

E. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2017a.

1.03 SUBMITTALS FOR REVIEW

A. Section 013300 - SUBMITTALS.

PART 2 - PRODUCTS

2.01 MATERIALS

A. ASTM A36/A36M, structural steel tubing.

2.02 BOLLARDS

A. Formed Steel Tubes: 1/4" thick, 6" diameter galvanized steel, concrete filled.

B. PVC Bollard Cover: Manufactured by ULINE, Model H-3719Y. Color: Yellow.

C. Quantity: As indicated on plans.

D. See Section 033000 - CAST-IN-PLACE CONCRETE for concrete requirements.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install units in accordance with manufacturer's instructions, without damage. Replace or repair damaged units.

B. Install units in alignment with adjacent work.

C. Install bollards in footings. Bollards shall be installed in locations as per Drawing requirements or in locations as directed by Architect/Engineer.

D. Install bollard cover. Drill and tap steel bollard to accept two (2) galvanized screws to attach bollard cover at 4" above final grade.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Finish grade subsoil.

B. Place, level and compact topsoil.

1.02 RELATED SECTIONS

A. A. Section 329219.16 – Hydroseeding.

1.03 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Deliver topsoil to the site in uncontaminated containers.

C. Do not stockpile topsoil over a height of 8 feet.

D. Cover stockpiled topsoil to protect from precipitation, erosion and contamination.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Do not place wet or frozen topsoil.

B. Do not place topsoil on wet or frozen ground or when precipitation is occurring.

1.05 COORDINATION

A. Coordinate work under provisions of Section 013100.

B. Coordinate with all adjacent work and work within areas to receive topsoil.

C. Coordinate the storage of topsoil under provisions of Section 311100 with the placement of topsoil in this section.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; friable loam; free of subsoil, clay or impurities, plants, weeds, roots, grass, stone and foreign matter; acidity range (pH) of 5.8 to 6.5; containing a minimum of 2.75 percent and a maximum of 25 percent organic matter. Topsoil may be reused from on-site if it meets these requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing substrate and conditions.

B. Verify site conditions and note irregularities affecting work of this section.

C. Beginning work of this section means acceptance of existing conditions.

3.02 PREPARATION

A. Prepare subsoil in accordance with Section 312000.

B. Eliminate uneven areas and low spots. Remove and dispose of debris, roots, branches and stones in excess of 1/2 inch in size. Remove and dispose of subsoil contaminated with petroleum products.

C. Scarify subsoil to depth of 3 inches where topsoil is scheduled to be placed. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.03 INSTALLATION

A. Place topsoil in areas where seeding, sodding or planting is scheduled or where shown on the plans.

B. Place topsoil to the depths as indicated on the plans.

C. Use topsoil in relatively dry state. Place during dry weather.

D. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles and contours of subgrade.

E. Remove and dispose stone, roots, grass, weeds, debris and foreign material while spreading.

F. Manually spread topsoil around trees, plants and building to prevent damage.

G. Lightly roll placed topsoil.

H. Remove surplus subsoil and topsoil from site. Do not remove surplus topsoil from the site prior to obtaining approval of the Engineer.

I. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.04 TOLERANCES

A. Maximum Variation from Proposed Elevation: 1/2 inch.

3.05 PROTECTION

A. Protect finished work under provisions of Section 016500.

B. Protect landscaping and other features remaining as final work.

C. Protect existing structures, fences, roads, sidewalks, paving and curbs. Any damage caused by the Contractor to any of these items shall be repaired promptly by the Contractor at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Seeding.

B. Mulch, fertilizer, hydromulch and other accessories.

C. Maintenance.

1.02 RELATED SECTIONS

A. Section 329119.13 – Topsoil Placement and Grading.

1.03 REFERENCES

A. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.04 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

1.05 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Provide data on seed mixtures, fertilizer and lime.

C. Certificates: Provide certificates indicating that all fertilizer, pesticides and herbicides comply with all applicable regulatory agency requirements.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017000.

B. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

1.07 QUALITY ASSURANCE

A. Seed: Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

1.08 REGULATORY REQUIREMENTS

A. Comply with applicable regulatory agencies for fertilizer, pesticide and herbicide composition.

B. All fertilizer, pesticides and herbicides to be used shall comply with all applicable regulatory agency requirements.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016000.

B. Deliver grass seed mixture in original sealed containers. Seed in damaged packaging is not acceptable.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

D. Deliver Hydromulch in UV and weather resistant bags, showing weight, chemical analysis and name of manufacturer.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not sow immediately following rain, during windy periods or if ground is frozen.

B. Do not sow when the ambient temperature is expected to drop below 40 degrees F or rise above 90 degrees F during the time in which the seed will establish itself.

C. Planting Season: April 1st through May 15th or September 1st through October 15th.

1.11 COORDINATION

A. Coordinate work under provisions of Section 013100.

B. Coordinate with grading and placement of topsoil.

C. Coordinate with installation of underground sprinkler system piping and watering heads.

1.12 WARRANTY

A. Provide a one-year warranty under provisions of Section 017000.

B. Include coverage for one continuous growing season; reseed areas of dead or unhealthy grass at no additional cost to the Owner.

1.13 MAINTENANCE SERVICE

A. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition, as determined by at least two cuttings, or until the job is accepted by the Owner, whichever occurs last.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Seed: Dry, fresh, re-cleaned seed of the latest crops and of the following proportions:

2.02 MIX A:

	Grass Type	% of Mixture	Min. % Germination
B.	Kentucky 31 Fescue	50	90
C.	N.K. 100 PERENNIAL RYE GRASS	25	85
D.	PENN LAWN FESCUE	25	90

2.03 MIX B:

	Grass Type	% of Mixture	Min. % Germination
B.	Merion Bluegrass	50	80
C.	Penn Lawn Fescue	30	90
D.	N.K. 106 Hybrid Rye Grass	20	85

2.04 ACCESSORIES

A. Mulching Material: Hemlock species wood cellulose fiber, dust form, free of growth or germination inhibiting ingredients.

B. Fertilizer: FS O-F-241, Type I, Grade A; recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions: Nitrogen 10 percent, phosphoric acid 6 percent, soluble potash 4 percent.

C. Limestone: Ground dolomitic limestone containing a minimum of 90 percent calcium and magnesium carbonates. One hundred percent (100%) shall pass a No. 10 mesh screen and a minimum of 70 percent shall pass a No. 100 mesh screen.

D. Hydromulch: 84 percent Mechanically processed straw, 15 percent Mechanically processed reclaimed cotton plant material and 1 percent of tackifier, activators and additives; minimum of 90 percent organic material; moisture content of 12 percent, total carbon to nitrogen ratio, 40:1. Color to be natural green.

E. Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of 90 percent organic material measured by oven dry weight; pH range of 4 to 5 percent; moisture content of 30 percent; with moisture absorbtive capacity of 450 to 500 percent.

F. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

G. Stakes: Softwood lumber, chisel pointed.

H. String: Inorganic fiber.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing substrate and site conditions.

B. Verify that prepared soil base is ready to receive the work of this section.

C. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Area to be seeded shall be cultivated with a scarifier to a depth of 4 inches. All stones, sticks and debris one inch and larger shall be removed. Area shall be smoothly graded to proper elevations.

3.03 APPLICATION

A. Fill tank of mechanically agitated hydroseeding machine with sufficient water to suspend seed and fertilizers.

B. Add water slowly while adding hydromulch. See manufacturer's recommendations to determine the proper application rate.

C. Agitate for a minimum of ten minutes after adding the last amount of water and hydromulch.

D. Apply hydromulch with a hydraulic seeder at a rate of 46 lbs per 1000 sq ft. Apply in a uniform layer from 2 opposing directions to ensure complete soil coverage.

E. Do not hydroseed areas in excess of that which can be mulched on same day.

F. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil. Discontinue watering if washing begins to occur.

G. Clean all surfaces which have received hydroseeding overspray.

H. Identify seeded areas with stakes and string around area periphery. Set string height to 24 inches. Space stakes at 8 feet on center.

3.04 MAINTENANCE

A. Maintain grass until job is accepted by the Owner or until the grass exhibits a vigorous growing condition, as determined by at least 2 cuttings, whichever occurs last.

B. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

C. Neatly trim edges and hand clip where necessary.

D. Immediately remove clippings after mowing and trimming.

E. Water to prevent grass and soil from drying out.

F. Immediately reseed areas which show bare spots.

3.05 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Protect seeded areas with warning signs during maintenance period.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Corrugated polyethylene pipe.

B. Fittings and accessories.

1.02 RELATED SECTIONS

A. Section 312000 - Earth Moving.

1.03 REFERENCES

A. ASTM D2321 - Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

B. ASTM F405 - Corrugated Polyethylene (PE) Tubing and Fittings.

C. ASTM F667 - Large Diameter Corrugated Polyethylene Tubing and Fittings.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on pipe, fittings and accessories.

C. Manufacturer's Instructions: Indicate special procedures and conditions required to install products specified.

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of pipe runs, connections and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable codes for materials and installation of the work of this section.

B. Install pipe in accordance with ASTM D2321.

1.07 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the plans and as required by the manufacturer.

1.08 COORDINATION

A. Coordinate pipe installation with the trenching.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Corrugated Polyethylene Pipe: ASTM F405 or ASTM F667 corrugated polyethylene; N-12 manufactured by ADVANCED DRAINAGE SYSTEMS, INC. or specifically approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify that trench cut is ready to receive work and excavations, dimensions and elevations are as indicated on the plans.

3.02 PREPARATION

A. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

B. Excavate under provisions of Section 312000.

3.03 INSTALLATION

A. Install pipe and accessories in accordance with manufacturer's instructions and approved shop drawings.

B. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding.

C. Shore pipe to required position; retain in place until after compaction of adjacent fills. Ensure pipe remains in correct position and to required slope.

D. Lay pipe to slope gradients noted on the plans, with maximum variation from true slope of 1/8 inch in 10 feet.

E. Backfill under provisions of Section 312000.

3.04 TOLERANCES

A. Maximum Variation from Intended Invert Elevation: 1/2 inch.

B. Maximum Offset of Pipe from True Alignment: 1 inch.

3.05 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 014500.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.06 PROTECTION

A. Protect pipe from damage or displacement until backfilling operation is in progress.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. PVC pipe for drainage and sanitary connections.

B. Fittings and accessories.

1.02 RELATED SECTIONS

A. Section 312333 - Trenching

B. Section 312323.13 - Backfilling

1.03 REFERENCES

A. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity Flow Applications.

B. ASTM D2729 - Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

C. ASTM D2855 - Recommended Practice for Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings.

D. ASTM D3034 - Standard Specification for Type PDM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

E. ASTM D3212 - Standard Specifications for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide data on pipe, fittings, accessories and marking tape.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017839.

B. Accurately record actual locations of pipe runs, connections and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable codes for materials and installation of the work of this section.

1.07 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the plans and as required by the manufacturer.

1.08 COORDINATION

A. Coordinate pipe installation with trenching and installation of drainage structures.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. PVC Pipe: CERTAINTEED, JM, CARLON.

B. Joint Lubricant: Manufacturer's standard.

2.02 MATERIALS

A. PVC - ANSI/ASTM D3034, Type PSM, Polyvinyl Chloride (PVC) material; inside nominal diameter as indicated, integral bell and spigot end joints, class DR 18 or SDR 35 as indicated on plans. Joints meet or exceed ASTM D3212.

2.03 ACCESSORIES

A. Marking Tape - Solid plastic tape with a minimum total thickness of 4.5 mil. Tape resilient to alkalis, acids, and other destructive elements; of sufficient strength that layers cannot be separated by hand or by exposure to boiling water for a period of three hours. Green in color, minimum 3" wide with the words "Caution - Sanitary Sewer" repeated every 16-36 inches, conforming to AWPA uniform color code.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate.

B. Verify that trench cut is ready to receive work and excavations, dimensions and elevations are as indicated on the plans.

C. Inspect all pipe and fittings before installation. Remove defective pipe from site.

3.02 PREPARATION

A. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

B. Excavate under provisions of Section 312316. Excavate sufficient clearance at each bell or coupling to allow uniform bearing along the pipe barrel.

3.03 INSTALLATION

A. Install pipe and accessories in accordance with ASTM D2321.

B. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding.

C. Shore pipe to required position; retain in place until after compaction of adjacent fills. Ensure pipe remains in correct position and to required slope.

D. Lay pipe to slope gradients noted on the plans, with maximum variation from true slope of 1/8 inch in 10 feet.

E. Repair surface damage to any pipe protective coating in accordance with manufacturer's recommendations.

F. Backfill under provisions of Section 312323.13.

G. After partially backfilling, install marking tape 18 to 24 inches above crown of pipe.

H. Construct cleanouts at locations shown and as detailed on the drawings. Use PVC wyes, bends and pipe as appropriate. Extend cleanout pipe to grade and terminate with plug.

3.04 TOLERANCES

A. Maximum Variation from Intended Invert Elevation: 1/2 inch.

B. Maximum Offset of Pipe from True Alignment: 1 inch.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection under provisions of Section 014500.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.06 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Protect pipe from damage or displacement until backfilling operation is in progress.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Precast concrete catch basins and field inlets.

B. Castings.

1.02 REFERENCES

A. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

C. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

D. ASTM C55 - Standard Specification for Concrete Building Brick; 2017.

1.03 SUBMITTALS

A. Submit under provisions of Section 013300 - SUBMITTALS.

B. Shop Drawings: Indicate dimensions and details of catch basins and castings.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500 - PRODUCT DELIVERY, STORAGE, AND HANDLING.

B. Store products on firm and level ground.

C. Handle products in such a manner which will not induce unnecessary stresses, cause cracks to occur or damage the product in any way.

D. Any cracked or otherwise defective materials will be rejected.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not mix or place mortar if ambient temperature is below 40 degrees F.

1.06 COORDINATION

A. Coordinate work under provisions of Section 013100 - PROJECT MANAGEMENT AND COORDINATION.

B. Coordinate with excavation, backfilling, installation of piping and all other work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. OLD CASTLE PRECAST, INC.

B. PRECAST CONCRETE SALES, CO.

C. Substitutions shall be permitted only after receiving written approval from the Architect/Engineer in accordance with Section 012500 - SUBSTITUTION REQUEST PROCEDURES.

2.02 MATERIALS

A. Catch Basin and Field Inlet Sections: Reinforced precast concrete, lipped male/female joint, of the following materials:
   1. Concrete: ASTM C150/C150M, normal Portland cement, Type 1; minimum 4,000 psi strength at 28 days.
   2. Reinforcement: ASTM A615/A615M reinforcing bars.
   3. Castings: ASTM A48/A48M, Class 30B, cast iron construction, machined flat bearing surface, non-rocking; removable grate, capable of supporting the AASHTO HS-20-44 highway loading; free from blowholes, shrinkage, distortion, cracks or other defects; smooth and of uniform quality; size and pattern as indicated on the plans, manufactured by CAMPBELL FOUNDRY COMPANY or specifically approved equal.

2.03 ACCESSORIES

A. Brick: ASTM C55, Grade N, Type I - Moisture Controlled; normal weight; nominal modular size as required.

B. Mortar: A 1:1:5 ratio of Portland cement, masonry cement and sand, respectively. Add water as required to create a workable consistency.

C. Catch Basin Steps: Cast iron rungs; pattern number 2589 as manufactured by CAMPBELL FOUNDRY COMPANY; pattern number R-1980-C as manufactured by NEENAH FOUNDRY COMPANY, or specifically approved equal.

D. Concrete for Formed Invert: ASTM C150/C150M, Portland cement type I, cast in place; 3,000 psi minimum strength at 28 days; dimensions as indicated on the plans.

2.04 FABRICATION

A. Fabricate and reinforce catch basin to the dimensions as indicated on the plans.

B. Pipe Entry: Provide openings as required.

C. Steps: Set or drilled and grouted in the catch basin wall at 18 inches on center vertically.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing grades are as indicated on the plans.

B. Verify items provided by other sections of work are properly sized and located.

C. Verify that rough openings for piping are as required.

3.02 INSTALLATION

A. Form bottom of excavation clean and smooth to the correct elevation. Compact bottom of the excavation to a minimum of 95 percent of maximum dry density.

B. Place catch basin, secure and level, to the proper elevation. Utilize a placement method which will not damage or crack the catch basin.

C. Place catch basin sections plumb and level, trim to correct elevations.

D. Cut and fit for pipe. Seal openings in wall around pipe with brick and mortar. Establish elevations and pipe inverts for inlets and outlets as indicated on the plans. Trowel surfaces smooth.

E. When indicated on the plans, place concrete in base of catch basin as required to form invert to the dimensions indicated on the plans. Trowel smooth.

F. Set slab top on catch basin in a 1 inch mortar bed.

G. Mount casting in a 1 inch mortar bed over access opening. Install firm, level and to the required elevation.

H. If required to achieve proper elevation of casting, adjust with brick and mortar. A maximum height of 5 inches is permitted between the catch basin and the base of the casting. Maintain a maximum of 1 inch thickness of mortar between all bricks.

3.03 TOLERANCES

A. Maximum Variation from Proposed Rim Elevation: 1/4 inch.

B. Maximum Variation from Proposed Location: 1/2 inch.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 014500 - QUALITY CONTROL.

B. Request inspection prior to backfilling around structure and prior to surface restoration.

3.05 PROTECTION

A. Protect finished work under provisions of Section 015000 - TEMPORARY FACILITIES AND CONTROLS.

B. Protect catch basin from damage or displacement until project is accepted by the Owner or Owner's Construction Representative.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Precast concrete manhole sections with tongue-and-groove joints, covers, anchorage and accessories.

1.02 RELATED SECTIONS

A. Section 312316 - Excavation

B. Section 312323.13 - Backfill.

1.03 REFERENCES

A. ASTM A48 - Gray Iron Castings.

B. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

C. ASTM C55 - Concrete Building Brick.

D. ASTM C150 - Portland Cement.

E. ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gaskets.

F. ASTM C478 - Precast Reinforced Concrete Manhole Sections.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: Indicate dimensions and details of manhole sections and castings.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to the site under provisions of Section 016500.

B. Store products on firm, level ground.

C. Handle products in a manner which will not induce unnecessary stresses, cause cracks to occur or damage the product in any way.

D. Any cracked or otherwise defective materials will be rejected.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not mix or place mortar if ambient temperature is below 40 degrees F.

1.07 COORDINATION

A. Coordinate the work under provisions of Section 013100.

B. Coordinate with installation of piping and all other work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. OLDCASTLE PRECAST, INC.

B. PRECAST CONCRETE SALES, CO.

C. Substitutions shall be permitted only after receiving written approval from the Engineer.

2.02 MATERIALS

A. Manhole Sections: ASTM C478 reinforced precast concrete lipped male/female joint, ASTM C443 gaskets; of the following materials:
   1. Concrete: ASTM C150, normal Portland cement Type I, minimum 4,000 psi strength at 28 days.
   2. Reinforcement: ASTM A615 reinforcing bars.

B. Castings: ASTM A48, Class 30B, cast iron construction, machined flat bearing surface, non-rocking, removable lid, open checkerboard grille lid design; able to support the AASHTO HS-20-44 highway loading; free from blowholes, shrinkage, distortion, cracks or other defects; smooth and of uniform quality; size and dimensions as indicated on the plans; manufactured by CAMPBELL FOUNDRY COMPANY or specifically approved equal.

2.03 ACCESSORIES

A. Brick: ASTM C55, Grade N, Type I - Moisture Controlled; normal weight; nominal modular size as required.

B. Mortar: A 1:1:5 ratio of Portland cement, masonry cement and sand, respectively. Add water as required to create a workable consistency.

C. Manhole Steps: Cast iron rungs; pattern number 2589-2252 as manufactured by CAMPBELL FOUNDRY COMPANY, or specifically approved equal.

D. Concrete for Formed Invert: ASTM C150 Portland cement Type I, cast in place; 3,000 psi minimum strength at 28 days; wood float finish; dimensions as indicated on the plans.

2.04 FABRICATION

A. Shaft Construction: Concentric with cone top section; lipped male/female joints with rubber gasket; dimensions and reinforcement as indicated on the plans.

B. Pipe Entry: Provide openings as required.

C. Steps: Set or drilled and grouted into manhole wall at 18 inches on center vertically.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing site conditions.

B. Verify existing grades are as indicated on the plans.

C. Verify items provided by other sections of Work are properly sized and located.

D. Verify that rough openings for piping are as required.

3.02 INSTALLATION

A. Form bottom of excavation clean and smooth to the correct elevation.

B. Place base pad, secure and level, to the proper elevation. Utilize a placement method which will not damage or crack the manhole.

C. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

D. Cut and fit for pipe. Seal openings in shaft wall around pipe with brick and mortar. Establish elevations and pipe inverts for inlets and outlets as indicated on the plans. Trowel surfaces smooth.

E. Place concrete in base of manhole as required to form invert to the dimensions indicated on the plans. Trowel smooth.

F. Mount castings in a 1 inch mortar bed over access opening. Install firm, level and to the required elevation.

G. If required to achieve proper elevation of casting, adjust with brick and mortar.

3.03 TOLERANCES

A. Maximum Variation from Proposed Rim Elevation: 1/4 inch.

B. Maximum Variation from Proposed Location: 1/2 inch.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014500.

B. Request inspection prior to backfilling around structure and prior to surface restoration.

3.05 PROTECTION

A. Protect finished work under provisions of Section 015000.

B. Protect manhole from damage or displacement until project is accepted by the Owner.

END OF SECTION