



Addendum # 2

New Jersey Schools Development Authority
Office of Procurement
1 West State Street
Trenton, NJ 08625
Phone: 609-777-1922
Fax: 609-656-4609

Date: April 24, 2013

PROJECT #: JE-0021-B01
New Elementary School #3

DESCRIPTION: Addendum # 2

This addendum shall be considered part of the Design-Build Information Package issued in connection with the referenced project. Should information conflict with the Design-Build Information Package, this Addendum shall supersede the relevant information in the Design-Build Information Package.

A. CHANGES TO THE PROCUREMENT PROCESS:

1. Not Applicable

B. CHANGES TO THE PROJECT MANUAL:

1. Volume 1: Modifications to Procedural Specifications:

a. **REPLACE:** Replace Specification Section 01410 "TESTING LABORATORY SERVICES" in its entirety with revised Section 01410 "TESTING LABORATORY SERVICES" dated April 22, 2013, included herewith as Attachment 2.1.

2. Volume 2: Modifications to Performance Specifications:

b. **REPLACE:** Replace Revised Specification Section D6000.00, Table D6000.00-1 Communications Responsibilities included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Table D6000.00-01 Communications Responsibilities dated April 22, 2013, included herewith as Attachment 2.2.

**C. CHANGES TO THE DRAWINGS:**

1. Not Applicable

D. BIDDER'S QUESTIONS, REQUESTS FOR INFORMATION AND RESPONSES:

1. Not Applicable

E. CHANGES TO PREVIOUS ADDENDA:

1. **Volume 2: Modifications to Performance Specifications:** For clarity purposes, the following items have been revised further and shall show revisions as "tracked changes" as follows: (additions in **bold and underlined** text; deletions in *strikethrough-and-Italics*):
 - a. **REPLACE:** Replace **PERFORMANCE SPECIFICATIONS** Section G2030.00 "PEDESTRIAN PLAZAS AND WALKWAYS" included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Section G2030.00 "Pedestrian Plazas and Walkways" dated April 22, 2013, included herewith as Attachment 2.3.
 - b. **REPLACE:** Replace **PERFORMANCE SPECIFICATIONS** Section G2050.00 "ATHLETIC, RECREATIONAL AND PLAYFIELD AREAS" included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Section G2050.00 "Athletic, Recreational and Playfield Areas" dated April 22, 2013, included herewith as Attachment 2.4.
 - c. **REPLACE:** Replace **PERFORMANCE SPECIFICATIONS** Section G2060.00 "SITE DEVELOPMENT" included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Section G2060.00 "Site Development" dated April 22, 2013, included herewith as Attachment 2.5.
 - d. **REPLACE:** Replace **PERFORMANCE SPECIFICATIONS** Section G2080.00 "LANDSCAPING" included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Section G2080.00 "Landscaping" dated April 22, 2013, included herewith as Attachment 2.6.
 - e. **REPLACE:** Replace **PERFORMANCE SPECIFICATIONS** Section G3000.00 "LIQUID AND GAS UTILITIES" included in Addendum No. 1 dated April 5, 2013 in its entirety with revised Section G3000.00 "Liquid and Gas Utilities" dated April 22, 2013, included herewith as Attachment 2.7.

Addendum #2

Project #: JE-0021-B01

Project Name: New Elementary School #3

Page 2 of 4



F. ATTACHMENTS:

1. Attachment 2.1 Revised Section 01410 – “Testing Laboratory Services,” dated April 22, 2013.
2. Attachment 2.2 Revised Section D6000.00, Table D6000.00-01 “Communication Responsibilities” dated April 22, 2013.
3. Attachment 2.3 Revised Section G2030.00 “Pedestrian Plazas and Walkways” dated April 22, 2013.
4. Attachment 2.4 Revised G2050.00 “Athletic, Recreational and Playfield” dated April 22, 2013.
5. Attachment 2.5 Revised G2060.00 “Site Development” dated April 22, 2013.
6. Attachment 2.6 Revised G2080.00 “Landscaping” dated April 22, 2013.
7. Attachment 2.7 Revised G3000.00 “Liquid and Gas Utilities” dated April 22, 2013.

Any bidder attempting to contact government officials (elected or appointed), including NJSDA Board members, NJSDA Staff, and Selection Committee members in an effort to influence the selection process may be immediately disqualified.

End of Addendum No. 2


NJSDA Director 4/24/2013
Date



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Addendum No. 2

Acknowledgement of Receipt of Addendum

Contractor hereby acknowledges the receipt of this Addendum by signing in the space provided below and returning via fax to (609-656-4609) or E-mail (mataylor@njsda.gov). Signed acknowledgements must be received prior to the Bid Due Date. Acknowledgement of the Addendum must be made in Section E.6 of the Price Proposal Submission.

Signature

Print Name

Company Name

Date

SECTION 01410 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. The Design-Builder shall employ and pay for the services of an independent Testing Laboratory to perform specified testing and laboratory services, including all testing and laboratory services required by code, contract, manufacturers' specifications, or other authorities having jurisdiction.
- B. Employment of Testing Laboratory shall in no way relieve Design-Builder of his obligation to perform Work in accordance with Contract Documents.
- C. Design-Builder and the Laboratory shall cooperate to facilitate the execution of its required services.
- D. Design-Builder shall pay for additional samples and tests required for Design-Builder's convenience or when initial tests indicate work does not comply with Contract Documents.
- E. Where the terms "Inspector" and "Testing Laboratory" are used, they mean and refer respectively to an officially designated and accredited Inspector of the Testing Laboratory and to the Testing Laboratory employed by the Design-Builder.

1.2 RELATED WORK

- A. Drawings and General Provisions of Contract, including but not limited to, General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this Section.
- B. Testing and laboratory services required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- C. Refer to Section 01411 and Element D, Services in the Performance Specifications, for testing in conjunction with MEP work.

1.3 QUALIFICATION OF LABORATORY

- A. Shall be an NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and laboratory services indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and acceptable to authorities having jurisdiction.
 - 1). NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2). NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- B. Shall be certified in the state of New Jersey to perform testing and laboratory services with respect to the required systems and disciplines.

SECTION 01410 - TESTING LABORATORY SERVICES

- C. Testing equipment shall be calibrated as required by the applicable codes and referenced standards.

1.4 LABORATORY DUTIES AND RESPONSIBILITIES

- A. Cooperate with the Design-Builder, the Authority, and authorities having jurisdiction; provide qualified personnel after due notice.
- B. Verify, where applicable, that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
- C. Perform specified sampling and testing of materials and methods of construction.
- D. Comply with Specifications, codes and referenced standards.
- E. Ascertain compliance of materials with requirements of Contract Documents.
- F. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
- F. Notify the Design-Builder, the Authority and the Project Management Firm/Construction Manager immediately of observed irregularities, deficiencies, work or materials which fail to meet the requirements of Contract Documents.
- G. Promptly furnish all written evaluations, reports and certifications as required by code, contract, manufacturers' specifications, or other authorities having jurisdiction. Provide copies at a minimum to Design-Builder, the Authority, Project Management Firm/Construction Manager, and authorities having jurisdiction as needed for project advancement and compliance with the Contract Documents. At a minimum each report shall include:
 - 1). Date issued.
 - 2). Project title and number.
 - 3). Testing Laboratory name.
 - 4). Name and signature of Laboratory inspector.
 - 5). Date and time of sampling or inspection.
 - 6). Record of temperature and weather conditions.
 - 7). Date(s) of laboratory tests.
 - 8). Identification of products and Specification Section.
 - 9). Location of sample of test in the Project.
 - 11). Results of tests.

SECTION 01410 - TESTING LABORATORY SERVICES

- 12). Interpretation of test reports and statement in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- 13). Any other information required by code, contract, manufacturers' specifications, or other authorities having jurisdiction.

H. Retest and reinspect corrected work.

1.5 DESIGN-BUILDER'S RESPONSIBILITIES

- A. Cooperate with Laboratory personnel; provide access to Work and to manufacturer's operations.
- B. Secure and deliver to the Laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
- C. Furnish the Laboratory with proposed concrete design mixes, and other material mixes which require evaluation by the Testing Laboratory, a minimum of fourteen (14) days prior to use on the Project.
- D. Furnish incidental labor and facilities:
 - 1). To provide access to Work to be tested.
 - 2). To obtain and handle samples at the project site or at the source of the product to be tested.
 - 3). To facilitate sampling and testing.
 - 4). To provide safe storage and curing of test samples.
- E. Notify Laboratory, the Authority and Project Management Firm/Construction Manager sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
- F. Make arrangements with Laboratory and pay for additional samples and tests required when initial tests indicate non-compliance with Contract Documents, including load tests.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01410

Table D6000.00-1 Communications Responsibilities

Item	By Design-Builder	By Others	Comments
Infrastructure			
MDF and IDFs	•		
Racks and Cabinets	•		
UPS for MDF and IDFs	•		
Entrance Conduits	•		
Grounding System	•		
Service Entrance Conduits	•		
Cable Management	•		
Vertical and Horizontal Cabling	•		
Data Outlets	•		
Routers		•	<u>Note change.</u>
Switches		•	<u>Note change.</u>
WiFi Routers		•	<u>Note change.</u>
Telephone System			
Wall Outlets	•		
Dedicated Lines	•		
Loud Bells	•		
Switching and Routing Equipment		•	
Handsets		•	
Elevator Communication System	•		

<i>Item</i>	<i>By Design-Builder</i>	<i>By Others</i>	<i>Comments</i>
Other Systems and Equipment			
Ceiling-Mounted Projectors	•		
Security System	•		
General Paging System	•		
Sound Enhancement System	•		
Music Playback System	•		
Clock and Bell System	•		
Internet Service Connection		•	
Cable Television Service Connection		•	
UHF Radio Communication System		•	
Other Requirements			
Cable Terminations	•		
Equipment and Cable Labeling	•		
Testing and Certifications	•		
System Warranty	•		

END OF SECTION D6000.00

SECTION G2030.00

PEDESTRIAN PLAZAS AND WALKWAYS

PERFORMANCE

A. Basic Function

1. Provide pedestrian plazas and walkways as required by the project program and by code, and that are adequate in extent and sufficiently durable to accommodate without damage the types of traffic that can be reasonably anticipated for the facility type and intended user population.
2. Pedestrian plazas and walkways comprise the following elements:
 - a. Exterior plazas and walkways, including surfaces beneath playground surfacing.
 - b. Exterior steps and ramps not connected to buildings, including handrails and stair nosings.
 - c. Pedestrian pavement curbs and gutters.
 - d. Appurtenances for plazas and walkways, including pavement markings and tactile warning strips.
3. Pedestrian plazas and walkways include the following:
 - a. Uncolored concrete pavement.
 - b. Integrally colored (tinted) concrete pavement.
 - c. Heavy-duty concrete pavement, uncolored.
 - d. Concrete street curbs.
 - e. Mountable concrete curbs.
 - f. Depressed (drop) curbs (ramps) for vehicles and pedestrians.
 - g. Stone (granite) curbs and pavers.
4. Walkways, pedestrian ramps, and exterior stairs: Provide paved surfaces as required for pedestrian movement on the site without injury to users or damage to building, landscaping, site furnishings, fencing and appurtenances.
 - a. Minimum widths: Sized to allow comfortable two-way traffic.
 - (1) Main Entrance: 144 in.
 - (2) Secondary Entrances and Emergency Exits: 60 in.
 - (3) Major Routes: 60 in.
 - (4) Secondary Routes: 48 in.
 - b. Handrails, railings, or protective walls: Required when pedestrian surfaces are more than 16 in above adjacent grade.
5. Where pavements and surfacing are integral with elements defined within another element group, meet requirements of both element groups.

6. Brand Names: Where brand names are listed, they represent the Basis of Design unless those items are identified as approved proprietary items in project requirements.
7. See Paragraph G, Environmental Impacts, in Section G0000.00, Sitework, for environmental requirements and restrictions.

B. Amenity and Comfort

1. Accessibility

- a. Comply with all codes requiring barrier-free access.
- b. Sloped pedestrian walkways and ramps: To the maximum extent possible, avoid pedestrian walkways with slopes greater than 1:20. Where greater slopes are necessary, provide code-compliant pedestrian ramps **with handrails and guards where required.**
- c. Avoid exterior steps to the maximum extent possible. Do not use individual risers.

2. Stair Comfort

- a. Steepness: Provide code-compliant exterior stairs with risers of not more than 6 inches in height.
- b. Landings: Provide exterior stairs with maximum rise of not more than 8 ft. between landings.

3. Appearance

- a. Pedestrian stairs, ramps, and walkways: Provide pedestrian walking surfaces that contrast with vehicular paving and achieve a smooth, consistent appearance.
- b. Railings, handrails, guardrails, and protective walls: Provide materials and finishes that are consistent with building exterior in appearance.

C. Health and Safety

1. Safety of Pedestrian Surfaces

- a. Slip resistance: Provide walking surfaces of exterior stairs, ramps, and walkways in compliance with code, and with a minimum static coefficient of friction of 0.80, measured in accordance with ASTM D2047-2004.
- b. Stairs
 - (1) Risers: Closed.
 - (2) Treads: Maximum bevel or radius on leading edge of 1/2 inch in, slope to drain.
- c. Guards, Guardrails, or Protective Walls
 - (1) Openings: No openings large enough for a sphere with a diameter of 4 in. to pass through.
 - (2) Minimum height: In accordance with code.
- d. Pedestrian ramps at drop curbs - all locations
 - (1) Provide code-compliant detectable warning surface tiles with high levels of luminance contrast and conspicuity for pedestrians with visual impairment.

- (2) Provide detectable warning surface tiles that will sustain dynamic vehicle loading based on AASHTO HS20-44 wheel load test.
- (3) Basis of Design: Armor-Tile cast-in-place vitrified polymer composite (VPC) detectable/tactile warning surface tile, with inline tactile truncated dome surface, and integral embedment flange anchoring system as manufactured by Engineered Plastics Inc., Williamsville, NY.
 - (a) Size: Minimum 2'-0" x 3'-0".
 - (b) Depth: 1-3/8".
 - (c) Face thickness: 3/16".
 - (d) Color: Federal Yellow (No. 33538).

D. Structural

1. Exterior stairs, ramps, and elevated walkways: Capable of supporting loads in excess of those required by code.
2. Exterior handrails, guards, and guardrails: Capable of resisting forces in excess of those required by code.

E. Durability

1. Service life span of paved surfaces: 25 years, under normally anticipatable usage.

PRODUCTS

A. Pedestrian Areas

1. Use any of the following:
 - a. Uncolored concrete pavement.
 - b. Integrally colored (tinted) concrete pavement.
 - c. Heavy-duty concrete pavement, uncolored.
 - d. Stone (granite) pavers.
 - e. Concrete street curbs.
 - f. Mountable concrete curbs.
 - g. Depressed (drop) curbs (ramps) for vehicles and pedestrians.
 - h. Stone (granite) curbs.
2. Do not use the following:
 - a. Concrete pavers.
 - b. Asphalt pavers.
 - c. Brick pavers.
 - d. Stamped asphalt.
 - e. Stamped concrete.

B. Exterior Handrails and Guardrails

1. Provide ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40) steel pipe, unless another grade and weight are required by structural loads.
2. Weld and grind all joints smooth.
3. Provide galvanized tamper-proof inserts, sleeves and other anchorage devices for connecting railings to concrete or masonry work.
4. For railings set in concrete, provide sleeves at least 6" in depth and ½" greater in diameter than railing. Set with nonshrink, nonmetallic grout designed for exterior applications.
5. **Install in a manner that will prevent accumulation of standing water at the base of posts.**
6. Provide factory galvanizing and high-performance finishing in custom colors.

C. Areas Beneath Exterior Sport and **Rubberized** Resilient Surfacing

1. Use any of the following:
 - a. Asphalt paving reinforced with geotextile.

D. Pedestrian Pavement Curbs and Gutters

1. Stone curbs.
 - a. Basis of Design: Granite vertical street (highway) type curb as manufactured by Swenson Granite Works, Newtown, CT.
 - (1) Granite curb color: standard grey.
 - b. Granite curb shall be free of seams that impair its structural integrity, and is to be supplied in random lengths from 3'-0" to 10'-0". Granite curbing shall meet the following criteria:
 - (1) Bulk density: ASTM C-97.
 - (2) Absorption: ASTM C-97.
 - (3) Compressive Strength: ASTM C-170.
 - (4) Modulus of rupture: ASTM C-99.
 - c. Granite curb dimensions: Granite curb is to be 4" in width, with the front arris line straight and true, with no variations greater than 1/8" measured from a two (2) ft. straightedge placed along the front arris line. The depth shall be a minimum of 17" measured from the top arris line to the bottom arris line, and shall have a tolerance of plus or minus 1".
 - d. Granite curb top finish: Sawn to a true plane with no projections or depressions greater than 1/8". Visible saw marks are permissible.
 - e. Granite curb face finish: Smooth quarry split face which is at right angles to the plane of the top, with no projections greater than ¼" or depressions greater than ½" above grade line, measured from the vertical plane of the face through the top arris line, and no projections or depressions of greater than 1" below the grade line.

- f. Granite curb back finish: Back surfaces shall be dressed, with no projections or depressions greater than ¼" for a distance of 4" from top arris. The remainder of the back face shall have no projections or depressions exceeding a batter of one inch in three inches.
 - g. Granite curb end finish: Ends of curbs at joints shall be approximately square with the planes of the exposed curb faces, and shall be sawn or hand-trimmed so that when the curbs are set, no space greater than ½" shall show for the full length and width of the joint. The curb ends below grade will be allowed to break back no more than 4".
 - h. Granite curb reveal: 6" typical.
 - i. Granite curb installation: Granular fill shall be placed and uniformly compacted to form a sub-base, and grade lines shall be strung for the entire length of all granite curb sections to allow for a visual inspection prior to installation. Stiff concrete shall be placed so as to surround every granite curb joint, end and intersection location, and shall be troweled smooth to ease installation of the vertical tree root barrier within the tree pits and tree trench. Note: Exercise extreme care to avoid any contact of concrete, especially tinted concrete, with the exposed faces of the granite curbing during placement and finishing.
 - j. Granite curb joints: Pre-molded expansion joints shall be installed every thirty (30) linear ft. maximum. Joints shall be mortared, slightly recessed and tooled. Dowels are not required. Mortar shall be composed of equal parts of cement and clean mason sand with sufficient water to make a mix of workable consistency. The materials shall conform to the requirements of ASTM C91 and C144. Note: Exercise extreme care to avoid any contact of mortar with the exposed faces of the granite curbing during placement and finishing.
- E. Integrally colored (tinted) concrete pavement
- 1. Where indicated, provide integrally colored pavement in colors to be determined.
 - a. Colored admixture: Comply with manufacturer's written instructions. Deliver colored admixtures in original unopened packaging.
 - b. **Match color of base course of building masonry.**
 - c. **Basis of Design: Mix-Ready Standard Dry Pigment Color by Davis Colors.**
 - d. Conform to the American Concrete Institutes ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete, ASTM C494 Standard Specification for Chemical Admixtures for Concrete, and ASTM C979 Standard Specification for Pigments for Integrally Colored Concrete.
 - e. Supplemental admixtures shall not be used unless approved by the manufacturer of the colorant. Do not add calcium chloride to the concrete mix as mottling and surface discoloration will occur.
 - f. Finish: Do not over trowel or burnish the surface, and provide a consistent broom finish. Note: Extreme care shall be exercised to prevent any concrete, especially tinted concrete, from contacting the exposed faces of adjacent materials and finishes during placement and finishing.

END OF SECTION G2030.00

SECTION G2050.00

ATHLETIC, RECREATIONAL AND PLAYFIELD AREAS

PERFORMANCE

A. Basic Function

1. Provide athletic, recreational and playfield areas as required by the project program and by code, and that are adequate in extent and sufficiently durable to accommodate without injury to users or damage the types of activities that can be reasonably anticipated for the facility type and intended user population.
2. Athletic, recreational and playfield areas comprise the following elements:
 - a. Exterior playground area sports (court) surfaces.
 - b. Pre-K and ~~Kindergarten~~ **Outdoor Play Space** resilient **rubberized** playground surface.
 - ~~c. Artificial turf at soccer field.~~
 - d. Artificial turf mounds within the resilient playground surface.
 - e. Miscellaneous painted ground games and graphics.
3. Sports surfacing: Provide smooth, seamless, and/or resilient surfacing for athletic activities that have positive surface drainage throughout, and are attractive, non-toxic and low maintenance.
4. Pre-K ~~Kindergarten~~ **and Outdoor Play Space** resilient surfacing: Provide smooth and resilient surfacing complying with CPSC Pub. No. 325 under and around playground equipment including climbing equipment, slides, merry-go-rounds, balance beam, etc.
5. Brand Names: Where brand names are listed, they represent the Basis of Design unless those items are identified as approved proprietary items in project requirements.

B. Amenity and Comfort

1. Thermal comfort: Provide pavements and surfacing at parking lots with minimum initial reflectivity of 0.3 to reduce solar heat gain.
2. Accessibility
 - a. Comply with all codes with respect to requirements for barrier-free access.
3. Appearance
 - a. Exterior Sports Surfacing at **Pre-K and Outdoor Play Space including** basketball court, running track, **trike path** ~~kickball field, four square~~ and other miscellaneous ground games and graphics: Provide surfaces that are smooth and colorful, and contrast with adjacent asphalt surfaces and ~~modular~~ concrete walls.
4. Resilience: Provide exterior sports surfacing with inherent flexibility and resilience appropriate for the intended uses and as follows:
 - a. At Pre-K ~~Kindergarten~~ Playground Equipment: Critical **fall** height of not less than 4 ft., when measured in accordance with ASTM F 1292-2004 in the Use Zones defined by ASTM F 1487-2005.

- b. **At Outdoor Play Space Playground Equipment: Critical fall height as specified by equipment manufacturer.**

C. Health and Safety

1. Safety of Surfaces
 - a. Slip Resistance: Provide walking surfaces with a minimum static coefficient of friction of 0.80, measured in accordance with ASTM D 2047-2004.
2. Comply with the following:
 - a. ASTM D412 Standard Test Method for Vulcanized Rubber.
 - b. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber.
 - c. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
 - d. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment.
 - e. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.

PRODUCTS

A. Exterior Sports Surfacing

1. Basis of Design: SportMaster ColorPlus four-coat acrylic emulsion court surface system manufactured by ThorWorks Industries, Inc., Sandusky OH.
 - a. Apply to new asphalt surface that has cured for a twenty-eight day period after installation and that is entirely free of dirt, dust and debris.
 - b. Do not apply when surface temperature is below 50 degrees F.
 - c. Apply surface system in strict accordance with the manufacturer's instructions and requirements.
 - d. First coat: Acrylic Resurfacer with Sand (CMT-33).
 - e. Second coat: Neutral Concentrate with Sand (CMT-40) mixed with ColorPlus Concentrate (CMT-39).
 - f. Third coat: Neutral Concentrate with Sand (CMT-40) mixed with ColorPlus Concentrate (CMT-39).
 - g. Fourth coat: Sport Wax Sealer (CMT-18).
 - (1) Note: All line striping and other painted graphics and games are to be completed prior to the application of the Sport Wax sealer.
 - h. ~~Any~~ exposed asphalt within the playground area: Acrylic Resurfacer with Sand, color: BLACK.
 - i. The second and third coats shall be the following colors at the following locations:
 - (1) **All areas of the Pre-K and Outdoor Play Space not otherwise indicated: LIGHT GREEN.**

- ~~(2) Kickball field: Grass "infield" Area, color: LIGHT GREEN.~~
 - (2) Kickball field "outfield" and "sidelines" (between the baselines and the inner circumference of the surrounding running track) color: FOREST GREEN.
 - ~~(3) Kickball baselines, including pitcher's "mound" and the batter's circle, color: BEIGE.~~
 - ~~(4) Kickball bases, pitcher's rubber and home plate to be painted solid white. The outlines of the batter's boxes are to be striped WHITE.~~
 - (3) **Trike path, color DOVE GREY. See D. Miscellaneous Painted Ground Games and Graphics for additional information.**
 - (4) Running track, color: RED with 2" wide WHITE stripes included within the 4'-0" lane widths.
 - ~~(5) Basketball court, color: BLUE with painted regulation striping color: WHITE.~~
 - ~~(6) Four square colors: Two opposing squares shall be ORANGE and RED. The second pair of opposing squares shall be YELLOW and LIGHT GREEN. Squares shall be defined by 2" wide painted WHITE stripes, and identified by minimum 1 ft. tall stenciled capital letters A, B, C and D also painted WHITE.~~
 - ~~(a) The letters A and D must oppose each other.~~
 - ~~(b) The Four square game court is located within a field of BLUE to match the adjoining half court basketball courts.~~
 - (7) The large rainbow graphic **at basketball backboard** in the outdoor classroom area, colors: RED, ORANGE, YELLOW, LIGHT GREEN and BLUE.
 - (a) The last two colors of the rainbow, Indigo (Blue Violet) and Violet (Purple), may require the manufacturer's assistance to accurately achieve, either by utilizing stock colors such as TOURNAMENT PURPLE, by mixing two or more stock colors or by producing a custom color(s) to accurately represent those colors of the rainbow.
 - j. Layout of all courts, shapes and lines shall be accurately laid out, drawn and masked, and in conformance with the requirements of each court or activity.
- B. Pre-K **and Outdoor Play Space** & ~~Kindergarten~~ Resilient **Rubberized** Playground Surface
- 1. Basis of Design: PlayBound Poured-in-Place system as manufactured by Surface America, Williamsville, NY.
 - i. Apply to new asphalt surface that has cured for a twenty-eight day period after installation and that is entirely free of dirt, dust and debris.
 - j. Do not apply when surface temperature is below 50 degrees F.
 - k. Apply surface system in strict accordance with the manufacturer's instructions.
 - l. Except as noted, the color of the EPDM top surface shall be a 50/50 blend of two (2) standard colors: SKY BLUE and TEAL.
 - (3) Inside the Trike Path, the color shall be **a blend of 75% ROYAL SKY BLUE and 25% SKY BLUE TEAL.**

- m. Install seamless poured-in-place resilient playground top (wear) course to cover all storm drainage inlets within the limits of the resilient surface. Cover all storm drainage inlets with a single layer of approved permeable geo-textile fabric prior to installation of the resilient playground surface.

C. Artificial Turf Mounds

1. Basis of Design: PlayBound TurfTop, as manufactured by Surface America, Williamsville, NY.
2. Provide 2" minimum pile height, drainage system, **and** stone subgrade ~~and granular infill~~ in accordance with manufacturer's recommendations.
3. Turf mounds
 - i. Create mounds of varying shapes, sizes, and heights as indicated on the Site Plan. The mounds shall vary in height relative to adjacent mounds, with highest points between 18 and 24 inches.
 - j. Cover artificial turf mounds with artificial turf, without granular infill.

D. Miscellaneous Painted Ground Games and Graphics

1. Basis of Design: 100% acrylic, VOC Compliant, lead free traffic and zone marking paint as manufactured by PPG Architectural Finishes, Inc., Pittsburgh, PA.
 - i. Apply two coats of Zoneline Traffic and Zone Marking Paint to the asphalt surface that has already received one coat of BLACK Acrylic Resurfacer with Sand, and one coat of Stripe-Rite primer.
 - j. For ~~the three variations of~~ hopscotch, **and** the map of the United States ~~and the alphabet snake graphics~~ that are to be painted on the asphalt surface within the **Outdoor Play Space** ~~playground area~~, all four standard colors of traffic and zone paint shall be used: WHITE, YELLOW, Handicap BLUE and RED. In addition to the four standard colors, RED and a smaller amount of WHITE shall be field mixed to make Pink. Handicap BLUE and a smaller amount of WHITE shall be field mixed to make Light Blue. RED and YELLOW shall be field mixed to make Orange. RED shall be field mixed with a smaller amount of Handicap BLUE to make Purple.
 - k. For the 128 ft. x 128 ft. outdoor chessboards to be painted on the asphalt surface within the **Outdoor Play Space** ~~playground~~ area, standard colors of traffic and zone paint shall be used: WHITE and YELLOW. The BLACK Acrylic Resurfacer with Sand shall be the finish of the black squares, and the WHITE traffic and zone paint shall be applied to create the white squares. The outside perimeter of the outdoor chessboards ~~are is~~ to be outlined by a 2" wide stripe of YELLOW traffic and zone marking paint to further define the chessboard from the surrounding asphalt surface.
 - l. **For the large labyrinth graphic in the Outdoor Play Space, field mix RED and YELLOW to make ORANGE.**
 - m. **For the traffic pavement markings on the trike path, provide center dashed lines 2" wide x 2' long in YELLOW, outside lane markings 2" continuous on both edges in WHITE, and (2) stop bars 6" wide x full lane width in WHITE.**

- E. Do not use the following within the playground area:
1. Concrete pavement, **except under the shelter structure and at designated sidewalks and ramps.**
 2. Rubber interlocking tile system.

END OF SECTION G2050.00

SECTION G2060.00
SITE DEVELOPMENT

PERFORMANCE

A. Basic Function

1. Provide all fixtures, equipment (other than that associated with services), and miscellaneous structures located out-of-doors that are required by the project program and that are required as a result of these and other requirements.
2. Site fixtures and equipment that shall be provided include:
 - a. Fences and Gates
 - (1) Ornamental steel picket fence
 - (2) Welded wire security fence.
 - ~~(3) Vinyl-coated chain-link security fence~~
 - b. Site Furnishings
 - (1) Play equipment
 - (2) Basketball backstops.
 - (3) Bicycle racks.
 - (4) Exterior shelter structures.
 - (5) Exterior table and bench units.
 - (6) Exterior benches.
 - c. Flagpole and American Flag
 - d. Site Specialties
 - (1) Utility pipe bollards
 - (2) Decorative security bollards
 - (3) Cast iron tree grates.
3. Where site fixtures and equipment elements also must function as elements defined within another element group, meet the requirements of both element groups.
4. Brand Names: Where brand names are listed, they represent the Basis of Design unless those items are identified as approved proprietary items in project requirements.

B. Health and Safety

1. Safety
 - a. All site fixtures and equipment shall comply with applicable codes and standards for safety.
2. Accessibility
 - a. All site fixtures and equipment shall comply with applicable codes and standards for barrier-free access.

C. Structure

1. All site fixtures and equipment shall be constructed of materials strong enough to resist forces generated by normal wear and tear and attempted forcible removal.
2. All concrete shall be 3500 psi unless otherwise noted.

D. Durability

1. Service Life
 - a. Minor Site Structures: Same as for equivalent building elements.
 - b. Other Fixed Site Improvements: 15 years under normal use and weather.
 - c. Athletic Nets: 5 years under continuous weather exposure.

PRODUCTS

A. Fences and Gates

1. Provide the following:
 - a. Decorative Steel Picket Fence
 - (1) Basis of Design: Montage II, (ATF) Welded Steel Ornamental Fence, manufactured by Ameristar Fence Products, Tulsa OK; provide where indicated.
 - (2) Steel material for fence panels shall conform to the requirements of ASTM A653/A653M with minimum yield strength of 45,000 PSI.
 - (3) All steel shall be hot-dip galvanized, with a minimum hot-dip zinc coating weight of 0.90 oz./sq. ft. (coating designation of G-90).
 - (a) All interior surfaces of tubes formed from uncoated steel sheet shall be hot-dip galvanized to meet the same standard.
 - (4) The fence system shall be capable of meeting the vertical load, horizontal load, and infill performance for industrial weight fences under ASTM F2408.
 - (a) Fence panels shall be capable of supporting a 400 lb. load applied at mid-span without permanent deformation.
 - (5) Style: Genesis (G) (three rail standard – 4" nominal spacing).
 - (6) Panel height: 6'-0".
 - (7) Panel length: 8' (nominal).
 - (8) Fence rails: 1-3/4" x 1 3/4" x 12 ga. tubing, with pre-punched picket holes spaced no more than 4.1715" o.c.
 - (9) Fence pickets: 1" square x 14 ga. tubing. Pre-punched picket holes in the rails shall be spaced no more than 4.1715" o.c.
 - (10) Posts
 - (a) Line posts: minimum 2-1/2" high tensile galvanized steel square tube.
 - (b) End, corner, and gate posts: minimum 3" x 3" high tensile galvanized steel square tube.
 - (c) Post spacing shall not exceed manufacturer's recommended spacing.

- (11) Hardware: Tamper-resistant hardware supplied by the fence manufacturer.
- (12) Finish: Manufacturer's inline electro-deposition epoxy/acrylic coating process complying with the coating performance criteria of ASTM F2408.
 - (a) Minimum cumulative coating thickness: 2 mils.
 - (b) Color: Bronze (N).
 - (c) Touch-up paint: Provide two aerosol cans of matching touch up paint.
- (13) Field touch-up painting process: Remove all metal shavings and burrs. Apply an approved zinc-rich metal primer to all cut edge or drilled holes. Apply two coats of matching touch-up paint supplied by the manufacturer..
- (14) Installation: All posts are to be set in 10" dia. x 3'-6" deep concrete footings. Concrete is to be a minimum of 3,500 PSI. The tops of the concrete footings are to be recessed a minimum of 6" below adjacent concrete sidewalks or adjacent asphalt surfaces. In asphalt areas, the tops of the concrete footings are to be finished so as to pitch slightly, to direct water away from the base of the posts. Fence panels are to be installed level and stepped as required to follow grade.
- (15) Gates: Matching all welded construction and finish – three rail – except with flush bottoms. Gates are to be fabricated using 1-3/4" x 1 3/4" x 12 ga. double channel rail, 2" sq. x 11 ga. gate ends and 1" sq. x 14 ga. pickets. Gates 6 ft. wide or wider will have an additional 1-3/4"sq. x 14 ga. intermediate upright. Gusset plates are to be welded to all upright to rail intersections. Cable trussing is to be provided for all gates leaves 6 ft. or wider.

(a) Pivot Gates

(i) Basis of Design: Continental Gate Co. Evolution Series, with panels to match fence.

(b) Double Swing Gate Hardware

- (i) Personnel gates: Two non-removable hinges per leaf; emergency egress UL-listed exit devices on each leaf. Provide heavy gauge matching mounting plates, strike plate receiver mounting points, and tamper-proof shield to prevent the emergency egress hardware from being manipulated from the exterior.
- (ii) Double vehicular gates: Three non-removable hinges per leaf; fork-style gravity latch and integrated padlock hasp and eye.

b. Welded Wire Security Fencing and Gates

- (1) Basis of Design: Omega II Fence Systems, as manufactured by Metaltech-Omega Inc., Laval, Quebec, Canada; provide for ~~all~~ fence locations as indicated, including rooftop play area, unless indicated otherwise.
 - (a) Provide matching gates at generator and transformer enclosures.
- (2) Style: Elite Double Wire Fence.
- (3) Fence panels: Panels to consist of one vertical cold-rolled steel wire between two horizontal cold-rolled steel wires. All cold-rolled steel wire is to be 6mm (0.236") in diameter. As per ASTM-A185, the wires are welded by resistance at

- each crossing point to form rectangles 1-15/16' x 7-7/8". The cold-rolled wire shall have break strength of 3,150 lb.
- (4) Fence panel orientation: Panels will be fabricated (and installed) with the ends of the vertical wires extending 1" from the first horizontal wire, thereby creating a spiked top. The bottom ends of the vertical wires are to be cut flush.
 - (5) Posts: All posts, including corner, end and gate posts, to be 3" sq., 11 ga., cold-rolled from 1008 grade steel and meet ASTM 513-00 and ASTM A787-01, G90 zinc coating. Post spacing not to exceed manufacturer's recommended spacing.
 - (6) Line post installation: In-ground, which requires a minimum of a 2'-0" post embedment. Maximum horizontal load of 3"x3" posts with 6' panels is 922 lbs.
 - (7) Gate post installation: In-ground, which requires a minimum of a 3'-0" embedment. 3" x 3" posts are required for openings up to 6 ft. wide. For larger openings, follow manufacturer's recommendations for larger sized posts.
 - (8) Universal bracket kits: Six (6) required per 6 ft. ht. panel.
 - (9) Special Panel Fitting (SPF) Kit: SPF-W kits are required where the fence is attached to the façade of the school, and/or the transformer/emergency generator enclosure, rather than an end post.
 - (10) Hardware: Only tamper-resistant hardware supplied by the fence manufacturer.
 - (11) Finish: The manufactured fence panels shall be coated with 1.6 oz. /sq. ft. hot-dipped galvanized (zinc GAW) in conformance with ASTM A123/A123M. Posts, caps, hinges, bracket kits, gate members etc., shall be zinc coated (galvalume process) (0.9 oz. /sq. ft.) as per ASTM A787-01. The polyester top coating is to be a minimum of 4 mils thick, applied by an electrostatic method. The coating performance shall meet or exceed the performance criteria of ASTM D 3359 – Method B; ASTM D 2794; ASTM B 117; and ASTM D 2247.
 - (12) Color: Taupe Brown (optional/textured).
 - (13) Field touch-up process: Follow manufacturer's recommendations to avoid negating the manufacturer's warranty.
 - (14) Swing gates: Matching all welded construction and finish. Swing gates to be fabricated in accordance with ASTM F900 using fully welded galvanized 2" x 2" square steel tube. Gate hardware is to conform to ASTM F900. Hinges, latch, drop rods, to be hot-dipped galvanized steel, and sized to assure proper operation. All non-moving parts to be matching polyester top coated. Standard latch is a clamp-on gravity system that is self-latching.
 - (a) ~~Single swing gates: None required.~~
 - (b) ~~Double~~ Swing gate hardware: Two non-removable hinges per leaf. Provide UL-listed exit devices on each leaf, with heavy gauge matching mounting plates, strike plate receiver mounting points, and tamper-proof shield to prevent exit devices from being manipulated from the exterior. Provide gate keeper hardware consisting of a mechanical device with gravity-lock system, to hold each leaf open when in the full open position.

2. Installation: ~~All in-ground posts are to be set in 10" dia. x 3'-6" deep concrete footings. Concrete is to be a minimum of 3,500 PSI. The tops of the concrete footings are to be recessed a minimum of 6" below adjacent concrete sidewalk surfaces.~~
 - a. For in-ground posts, provide minimum 2'-0" embedment for line posts and 3'-0" for gate posts.
 - b. At rooftop play area parapets, coordinate fence installation with parapet wall design, coping system and lightning prevention system in a manner that is code-compliant and acceptable to manufacturers of each system.
 - c. At rooftop play area roof deck, coordinate fence installation with building structure, roofing system and paver system in a manner that is code-compliant and acceptable to manufacturers of each system.
 - d. At retaining walls, provide flange-mounted posts subject to compliance with manufacturer's installation guidelines.
 - (1) For sloping installations up to 3 degrees of pitch, install panels following the slope of the wall.
 - (2) For sloping installations over 3 degrees of pitch, install panels level and stepped
 3. Provide accessories as required to meet code requirements and sloping safety top at rooftop play area(s).
 - a. At rooftop play area perimeter fence, provide the matching optional 45° overhang extension, minimum extension 1'-6 1/8", with 1'-4 1/8" panels, welded to ends of square posts to form 45° angle facing inward; attach with two universal fasteners per extension panel.
 4. Provide tamper-proof interlocking mechanism at all pairs of gates to prevent unauthorized entry.
- B. Site Furnishings
1. Play Equipment—Pre-K Outdoor Play Space
 - a. Basis of Design: Play equipment, appropriate for children 2 to 5 years of age, manufactured by Columbia Cascade Company, Portland, OR.
 - (1) Play equipment: Pipeline Series, #9878, 30' x 21'; structure consisting of the following features:
 - (a) Abacus.
 - (b) Accessible transfer station, 8" riser (2).
 - (c) Addition panel.
 - (d) Arch climber.
 - (e) Arch ring climber.
 - (f) Baluster wall.
 - (g) Baluster wall with ship's wheel.
 - (h) Coil climber.

- (i) Convex/flat mirror panel.
 - (j) CrossClimber cargo net.
 - (k) Decorative arch (2).
 - (l) Kid's bench.
 - (m) Spelling panel.
 - (n) Tube chute, curved.
 - (o) Vertical loop climber.
 - (p) Welcome/rules sign.
 - (q) Wide slide chute.
 - (r) Wave/slalom.
 - (s) **SofDek plastic-coated perforated steel.**
- ~~(2) Deck: SofDek plastic-coated perforated steel.~~
- (3) Balance Beam: Pipeline Series Separates, steel, #1628-12-02.
 - (4) KidSpinner: Pipeline Series Separates, #1630-5-22-PL.
 - (5) Accessible Outdoor **Ground-Level** Play Components: **Pipeline Series.**
 - (a) One group of three posts **supporting** ~~and~~ the following panels:
 - (i) Tic-tac-toe, **#1606.** ~~(x3)~~
 - (ii) Spelling panel—vertical mount, **#1609-50 (top)** ~~(x3)~~
 - (iii) **Abacus, #1614-56-02.**
 - (b) One group of four posts **supporting** ~~and~~ the following panels:
 - (i) Alphabet, **#1614-04-02.**
 - (ii) Storefront countertop, **#1614-53** (center position).
 - (iii) Maze panel, **#1614-56-02.**
- b. Colors
- (1) Posts and railings: Ocean Teal.
 - (2) Accessories: Ocean Teal.
 - (3) Perforated steel: Brown.
 - (4) Plastic deck color: Tan.
 - (5) Balance beam: Red.
 - (6) Kid spinner: Chrome Yellow.
 - (7) Accessible outdoor **ground-level** play components: to match others in the **Pre-K Outdoor** Play Space.

- c. **Trike Path Signage**
- (1) **Basis of Design: Pole-mounted signs by Playworld Systems, Lewisburg PA, complying with ASTM F1487.**
 - (2) **Install signs in appropriate locations with pavement markings indicated.**
 - (a) **Stop sign: #ZZPD3370.**
 - (b) **Yield sign: #ZZPD3380.**
 - (c) **Speed Limit 5 sign: #ZZPD3390.**
 - (d) **School Zone sign: #ZZPD3410.**
 - (e) **Traffic Light: #ZZPD3450.**
2. Play Equipment—Outdoor Play Space
- a. Basis of Design: Play equipment, appropriate for children 5+ 6 to 12 years of age, manufactured by Columbia Cascade Company, Portland, OR.
 - (1) Play equipment: Interplay Series, #78477815; structure consisting of the following features:
 - (a) **SpiralKid** spinner.
 - (b) Rails.
 - (c) Cap with pennant.
 - (d) **Cruiser** ~~Warp~~ net.
 - (e) Wobbler and portal.
 - (f) Loop climber.
 - (g) **Welcome/Rules sign.**
 - (2) **Play equipment** Net climber: Interplay Series, #78397815.
 - b. Colors: To be determined.
 - (1) **Provide banners to match school colors (TBD).**
3. Basketball Backstop
- a. Basis of Design: Heavy-duty adjustable-height basketball backstop with aluminum-trimmed, steel-framed and angle-braced glass backboard manufactured by Escalade Sports, Evansville, IN.
 - (1) Model #B3101, Goalrilla CV-72 Basketball System; adjustable from 7 ½ ft. to 10 ft. goal height.
 - b. Provide anchoring system consisting of manufacturer's mounting plates and anchor bolts set in reinforced 3,500 PSI concrete footings of a minimum diameter of 16" by 48" in depth, as specifically recommended by the manufacturer.
 - c. Assemble and install basketball backstops using factory supplied hardware only, in accordance with manufacturer's instructions.
 - d. Provide manufacturer's fitted pads for backboard bottom edges and goal posts.

4. Bicycle Racks
 - a. Basis of Design: Bike racks manufactured by Belson Outdoors, North Aurora, IL.
 - (1) Model #G8-G-IG, Genesis Bike Rack; four hoops for eight bikes; in-ground mounted. Finish: Manufacturer's standard hot dipped galvanized.
 - (2) Provide optional two-piece grout covers, Model #GC-238, spun aluminum.
5. Sand/Water Table (**elevated and accessible**)
 - a. Basis of Design: **PlayDesign** Model **#ZZXX1280#ZZXX1270S** by AAA State of Play, Indianapolis, IN; ground-mounted, with covers **and drains**.
 - b. Colors: **Standard; red posts with blue top.** *To be determined.*
6. Sandbox
 - a. **At-grade sandbox within the Pre-K Outdoor Playspace, 18" deep, and as follows:**
 - (1) **Continuous cast-in-place flush concrete curb edge, 6 in. wide x 18 in. deep.**
 - (2) **Integral semi-circular concrete seat 12 in. high x 12 in. wide, as indicated at the wide end of the sand box.**
 - (a) **Round or slope ends and chamfer all edges.**
 - (b) **Surface all exposed seat faces and edges with a trowel-applied ½-¾ in. layer of EPDM resilient playground surface material; match color to adjacent resilient surface under play equipment.**
 - (3) **Warp asphalt (with applied exterior sports surfacing) surrounding sand box to prevent surface runoff from entering the sand box.**
 - (4) **Line sand box bottom with black 45-mil EPDM pond liner (similar to Firestone).**
 - (a) **Extend liner under the bottom of the flush concrete curb/integrated seat.**
 - (b) **Install liner over a 2 in. thick layer of clean sand over compacted subgrade free of sharp stones or other objects which could damage the liner.**
 - (c) **Pitch liner integrated drain at the center of the sand box.**
 - (5) **Provide integral PVC bottom drain for use with pond liners (similar to Tetra USA, Inc.).**
 - (a) **Size for a 3 in. PVC drain line.**
 - (b) **Protect drain with a 3' x 3' square of geotextile, covered and secured to the liner with trowel-applied ½-¾ in. layer of EPDM poured-in-place resilient playground surface material.**
 - b. **Play sand: 18 in. deep layer of washed fine white certified play sand, without free crystalline silica dust, and as follows:**
 - (1) **Particle size range 0.4 - 0.5 mm.**

- (2) Feldsparic sand, non-toxic and AP approved, certified to be from a pre-approved source.
- (3) Provide MSDS sheet without a toxin or cancer warning. ~~Provide cast-in-place concrete frame and bench, with filter fabric lining and 0.4-0.5 mm-washed white sand.~~

7. Exterior Shelter Structures

- a. Basis of Design: Poligon e ~~Exterior shelter structures manufactured by PorterCorp, Holland, MI.~~
 - (1) Pre-K Outdoor Play Space: Riverwalk Arc ~~Two-column~~ barrel roof rectangular shelter, three embedded columns, 8 x 24 feet, with manufacturer's Mega-Rib ~~standing-seam~~ metal roof and matching rake trim end caps.
 - (a) Posts: #K01, standard plain square steel, with column covers.
 - (b) Integral seating: #S51.
 - (c) Manufacturer's factory-applied Kynar-500 PVDF finish; colors as follows:
 - (i) Roof: Copper Penny.
 - (ii) Columns and frame: Almond.
 - (iii) Seating: Harbor Blue.
 - (2) Outdoor Play Space: Poligon Double Tree ~~t~~two-column elongated dodecagon ~~octagon~~ hip roof structure, #DTS2030 ~~DTS2040~~, with manufacturer's standing seam metal roof.
 - (a) Posts: #K01, standard plain square steel, with column covers.
 - (b) Manufacturer's factory-applied Kynar-500 PVDF finish; colors as follows:
 - (i) Roof: Brite Red.
 - (ii) Columns and frame: Glacier White.
 - (c) Provide concrete pad under shelter matching size and shape of roof.
 - (3) Provide weatherproof, lockable duplex electrical receptacles in each post of Double Tree and end posts of RiverArc.

8. Exterior Table and Bench Units

- a. Basis of Design: Exterior table and bench units manufactured by Dumor, Inc., Mifflintown, PA.
 - (1) All aluminum frame picnic tables with welded table top and seat braces, 8-ft. model no. 156-80PL, and 8-ft. accessible model no. 156-68-1PL.
 - (2) Provide two of each model, with standard mill finish frame and factory-supplied stainless steel hardware.
 - (3) Table tops and seats shall be high-density polyethylene recycled plastic lumber; color: Cedar.

9. Exterior benches

- a. Basis of Design: Exterior wall-mounted 6-foot Victory Bench with expanded seat, as manufactured by Anova, St. Louis, MO.
 - (1) Colors: Manufacturer's standard polyester powder-coated finish, in colors to be determined.
 - (2) Exterior bench unit assembly by contractor using factory supplied stainless steel hardware only, in accordance with manufacturer's instructions.
 - (3) Seat mounting height: 14" to 16".

10. Planters

- a. Basis of Design: Bison Innovative Products Cubes.
 - (1) Provide PC482436, Bronze, and PC482420, Red, in quantities as shown on drawings.

C. Retaining Walls

- 1. For exposed surfaces of retaining walls, use form liners during casting.
 - a. Basis of Design: Scott System Form Liners Model #111 Stone Ground Fractured Granite.
- 2. Provide ¼" chamfer or bull nose at all exposed edges.

D. Site Specialties

1. Utility pipe bollards

- a. Provide custom-fabricated utility pipe bollards consisting of lengths of 8" dia. schedule 40 steel pipe; provide at parking lot and service court only.
 - (1) Provide steel pipes 6'-0" long overall, with two ½" dia. holes drilled 6" up from the bottom to accept a 12" long steel dowel pin welded to pipe walls.
 - (2) Exposed portion of bollard shall be 3'-6" above adjacent finish grade.
 - (3) Fill pipes completely with concrete after installation.
 - (4) Dome concrete surface above the top of the pipe; finish neatly to prevent water infiltration.
- b. Provide 18" dia. x 3'-6" deep concrete footing at each utility bollard location. Recess footing top a minimum of 6" below adjacent concrete sidewalk or asphalt surfaces.
- c. Finish
 - (1) Apply G90 galvanizing and two full wet shop-applied coats of metal primer to inside and outside surfaces and all edges of pipes after fabrication.
 - (2) Apply two coats of oil-based exterior gloss enamel after installation and concrete filling.
 - (3) Top coat color: Federal (safety) yellow.

2. Decorative security bollards

- a. Basis of Design: Manufacturer: Dumor, Inc. of Mifflintown, PA., Model #450-36-01, 36" ht. hex bollard; provide at all bollard locations not indicated as utility pipe bollards..
- b. Bollard Installation: S-1 Embedded. Provide 4" diameter schedule 40 steel pipe set in concrete footing at each bollard location as per manufacturer's instructions.
- c. Schedule 40 steel pipes to be 6'-0" long overall, with a 1/2" dia. hole drilled 6" up from the bottom to accept an 8" long welded steel dowel pin. Pipes are to be hot dipped galvanized post- fabrication (GAW). Steel pipes are to be completely filled with concrete after installation into their respective concrete footings.
- d. Concrete footing: Provide an 18" dia. x 3' - 6" deep concrete footing, to secure the sch. 40 steel pipes at each decorative security bollard location, as per manufacturer's Drawing No. 450-36-01. Concrete is to be a minimum of 3,500 PSI. The tops of the concrete footings are to be recessed a minimum of 6" below the adjacent concrete sidewalk surface.
- e. Assembly: Assemble decorative security bollards over 4" steel pipes following the manufacturer's instructions.
- f. Finish: Manufacturer's standard polyester powder-coated finish; color: Argentio.

3. Exterior wall-mounted chalkboard

- a. Basis of Design: Custom fabrication. The exterior wall-mounted chalkboard shall be fabricated from two (2) 4' x 8' sheets of 3/4" thick Extira brand treated exterior panels (S1S) thereby creating a single 4' high x 16' long panel.
- b. Joinery: The Extira panels shall be aligned and joined using commercially available countertop type connection hardware such as "Quickdraw", "FastCap" or "Dogbone" style connectors suitable for use in an exterior application, that are attached to the back face as required, plus edge gluing using an exterior glue product approved by the panel manufacturer.
- c. Surface preparation and priming: The joined Extira panel shall be primed using one of the alkyd type exterior wood primers recommended by the manufacturer, such as Sherwin-Williams A-100 Alkyd-Oil Primer (Y24W20) or Benjamin Moore Fresh Start All Purpose Alkyd Primer (024/C024). Two shop (2) coats of primer are required on all surfaces and edges. All raw surfaces and edges are to be sanded with 180 grit sandpaper, and thoroughly cleaned before applying any paint or primer. To avoid chipping, all sharp edges shall be rounded slightly before priming. Both the first and second coats of primer are to be sanded with 220 grit sandpaper. Allow a full 48 hours drying time before applying topcoats.
- d. Basis of Design for topcoat finish: Apply two (2) top coats of Porter's Original Paint brand exterior grade chalkboard paint as manufactured by Sydney Harbor Paint Co., West Hollywood CA, Dark Chocolate.
- e. Frame and chalk tray: The entire perimeter of the exterior chalkboard is to be framed by, and secured within, an appropriately sized custom frame consisting of fully welded aluminum structural angles and/or structural tubes, as required to support and mount the exterior chalkboard to the exterior wall of the school.

The aluminum frame should allow for a minimal amount of normal expansion and contraction of the Extira panel. The frame shall also incorporate a full length bottom mounted chalk tray. Care shall be exercised to avoid any sharp edges or protrusions, such as square corners on the ends of the chalk tray, which could cause injury if contacted by young children.

- f. Frame and chalk tray finish: Post fabrication, the aluminum frame and chalk tray are to be thoroughly sanded/cleaned to remove any burrs, weld splatter and shop/fabrication marks, blemishes or contaminants, and then completely sealed with One (1) coat of Sharkhide Metal Protectant manufactured by The Eastwood Co., Pottstown, PA
 - g. Mounting: The aluminum framed exterior chalkboard is to be mounted to the exterior masonry wall of the school. The height of the bottom of the chalkboard (the chalk tray) is to be no more than 2'-0" above grade, so as to be accessible to kindergarten age children and the physically disabled.
 - h. Mounting hardware: Mounting hardware is to be 3/8" diameter stainless steel threaded expansion type anchor bolts as manufactured by the Hilti Corporation. Anchors should be installed into mortar joints rather than into the faces of masonry units wherever possible. Minimum number of anchor bolts required is twelve (12).
4. Tree Grates
- a. Basis of Design: Neenah Enterprises, Inc., Neenah, WI.
 - (1) Model #R-8717, 60" x 60" cast iron grate, with 36" tree opening and #R-8500 Type U frame.

END OF SECTION G2060.00

SECTION G2080.00
LANDSCAPING

PERFORMANCE

A. Basic Function

1. Provide landscaping as indicated over all areas of the site not finished with paving, surfacing, or buildings.
2. Design-Builder shall prepare the planting areas, install the plant medium, plant material and maintain the landscape installation through acceptance and during the subsequent two (2) calendar year maintenance period.
3. Plant material as described, shall be nursery grown. All plant material shall conform to the American Standard of Nursery Stock, Standard ASA Z 60.1, American Association of Nurserymen, Washington, DC.
 - a. Sizes of plant material: Measurements of trees and shrubs shall be taken when their branches are in a normal position. Height and spread dimensions specified in the Plant Schedule refer to the main body of the plant, not from branch tip to tip. Caliper of trees shall be taken twelve (12) inches above ground level.
 - (1) Trees and shrubs larger than specified in the Plant Schedule are acceptable.
 - b. The following types of plantings are required:
 - (1) Street tree plantings.
 - (2) Ornamental tree plantings.
 - (3) Shrub plantings.
 - (4) Groundcover plantings.
 - (5) **Ornamental grasses.**
 - c. Substitutions may be permitted only if proof is submitted to the owner that specific plants or sizes are unobtainable.
 - d. Balled and burlapped plants that have cracked or broken balls prior to or during planting operations are not to be planted and must be replaced.
 - e. Permanent erosion control plantings are not required.
4. Provide conveniently located and appropriately sized tamper-proof water connections for standard hoses. Hoses shall be provided by the school district.
 - a. Provide non-permanent irrigation equipment and appurtenances as required to accomplish maintenance activities during the two (2) year maintenance period.
5. Provide drip irrigation system for planting bed(s) where indicated at planting bed within Play Area.
6. Where landscaping elements also must function as elements defined within another element group, meet the requirements of both element groups.

7. Brand Names: Where brand names are listed, they represent the Basis of Design unless those items are identified as approved proprietary items in project requirements.
- B. Amenity and Comfort
1. Convenience
 - a. Hose connections: At intervals as required so that hoses can reach all areas to be watered, using hoses of not more than 100 feet in length.
 2. Appearance
 - a. Plants: Arranged and planted for acclimation to local micro-climate, and pleasant, healthy and upright appearance throughout the year.
 - (1) Provide the landscape design using the specified trees, shrubs, and ground covers, as shown in the Basis of Design.
 - (2) Provide a neat and tidy urban landscape.
 - (3) Provide a landscape that will look complete within two (2) years after planting, and that will remain of basically the same appearance indefinitely without significant pruning.
 - (4) Do not use any turf grass.
 - b. Plants in Beds: Mulched for a tidy appearance.
 - c. Mulch: Use double –shredded hardwood mulch, installed at a minimum consistent depth of 3”, installed after all plant material has been installed.
- C. Health and Safety
1. Accidental Injury
 - a. The ground cover plant material used must be non-toxic if accidentally ingested.
 2. Potable Water Contamination
 - a. Prevent contamination of the potable water supply during landscape watering activities prior to acceptance, and during the subsequent two (2) calendar year maintenance period.
- D. Quality and Durability
1. Service Life: It is understood that survival of plant material is dependent on original condition and weather conditions as well as routine maintenance. The Design-Builder is responsible for supplying, and properly installing, healthy vigorous plants, and subsequently maintaining those plants during the two (2) year maintenance period.
 - a. Topsoil for backfill: Suitable for growing the plants provided, with adequate organic content and nutrients for the first two years of growth, based on recommendations of established authorities, meeting the minimum standards set forth in the NJDOT specifications.
 - b. Provide professional comprehensive regularly scheduled landscape maintenance services of all plants and mulched beds (including weeding of planting beds and tree pits) during the first two years after completion and acceptance.

- c. At the end of the first year of the two (2) calendar year maintenance period after completion and acceptance, if any plants are dead or dying in the opinion of the owner's representative, replace them with new matching plants. Replacement plants shall be maintained for the duration of the two (2) calendar year maintenance period.
 2. Insects, Disease and Damage: All plants are to be free of damage, injury, insect infestation or the presence of disease at the time of delivery to the project. Any and all plants that are damaged, or appear to be infested or diseased are to be immediately removed from the project and not returned. All plant material shall have well-developed root systems.
- E. Operation and Maintenance
1. Irrigation Water Source: Same as building supply.
 2. Water Conservation
 - a. ~~Despite the fact that a permanent irrigation system is not required,~~ Conserve water wherever possible through the use of hand watering and soaker hoses during the maintenance period **in locations not covered by a permanent irrigation system.**

PRODUCTS

- A. Plant materials: See Plant Schedule.
- B. Mulch
1. Double-shredded hardwood mulch, natural dark brown in color, which includes no construction debris or other deleterious material or litter.
 - a. **Install a 3" thick (minimum) continuous layer in all tree pits and planting beds after installation of plant material.**
 2. **Shredded cedar bark mulch, natural light in color, which includes no construction debris or other deleterious material or litter.**
 - a. **Install a 2" thick (minimum) continuous layer in all rooftop planters after installation of plant material and in planters being left open for use by students.**
- C. Edgings for Beds
1. Landscape edging is not required because of the presence of one of the following hardscape elements at all locations:
 - a. Concrete walls, as shown on the site plan.
 - b. Concrete sidewalk (and/or flush concrete curbing) as shown on the site plan.
 - c. Asphalt pavement as shown on the site plan.
 - d. Granite curb, as shown on the site plan.
 - e. Modular concrete block planter/seat walls, as shown on the site plan.
- D. Irrigation System
1. **Provide a complete, code-compliant drip irrigation system, including all appurtenances, to provide complete coverage within the long narrow planting bed containing predominantly ornamental grasses, located along the length of the education wing of the new school facility within the Play Area.**

2. Basis of Design
 - a. Controller: Irritrol KwikDial.
 - b. Rain sensor: Hunter Mini-Clik.
 - c. Solenoid valve: Hunter SVR.
 - d. Valve box: Rain Bird VB-10RND-H.
 - e. **Emitters: Polyethylene emitter pipe with pre-installed emitters supplying 1 gal/hr/emitter.**
 3. Provide complete system with backflow preventer, anti-siphon equipment, control wiring, 1" copper pipe to solenoid valve, and polyethylene irrigation pipe and emitters.
 4. Locate controller and head end equipment in janitor's closet.
 5. **Provide maintenance data and training in compliance with Section 01820, Operation and Maintenance Data and Training.**
 - a. **After system acceptance, provide the first winterization service of the system and on-site assistance required by the district to assure proper operation the following spring.**
- E. Tree Grates
1. Basis of Design: Neenah Enterprises, Inc., Neenah, WI.
 - a. Model #R08717, 60" x 60" grate, with 36" tree opening and #R08500 Type U frame.
- F. Root Barrier
1. Basis of Design: Century Root Barrier as manufactured by Century Products.
 - a. CR-PE Series, 2'-0" tall x 0.060" thick black polyethylene with ultraviolet inhibitors, molded with root-deflecting ribs, supplied in rolls.
 - b. Install the root barrier using the "surround application" installation method for the large ~~circular~~ **triangular** tree pits, continuously along the outside edge of the tree pit, and completely surrounding the root ball with the extent of barrier overlap at the seam as recommended by the manufacturer.
 - c. **Install the root barrier using the "linear application" installation method in the elongated tree pit/beds. Install continuously along the outside perimeter edges of the elongated tree pit/beds, and not by surrounding the root balls of each individual tree.**
 - d. **Root barrier is not required in beds which do not contain trees but only shrubs, ground cover and ornamental grasses.**
 - e. Root barrier shall be installed with the top of the barrier positioned 1/2" below the elevation of the surrounding pavement (sidewalk or asphalt) surface, not at the tops of adjacent curbs or walls where present.
 - f. Root barrier to be installed vertically, with the root deflecting ribs facing the plants. Care shall be taken to not allow topsoil backfill to become lodged between the surrounding hardscape edges and the outer face of the root barrier. Do not distort the root barrier during installation.

- g. Follow all manufacturers' recommendations for splicing rolls and securing the cut ends of the root barrier with the approved sealant and mechanical fasteners.

G. Environmental Engineering Control

1. Provide environmental engineering control at all planters, planting beds and tree pits as described in Section G1070.00, Site Earthwork and all applicable project requirements and regulations.

H. Fertilizer

1. Basis of Design: Agriform 20-10-5 Planting Tablets Plus Minors, as manufactured by The Scots Company LLC.
 - a. Provide 21-gram size slow-release Agriform Tablets for all shrubs and trees (Stock No. 90026).
 - b. Provide 5-gram size slow-release Agriform Tablets for all groundcover plants (Stock No. 90915).
 - c. Install tablets as follows: Position plant in hole and backfill halfway up the root ball. Place tablet(s) beside the root ball, approximately 1 inch from the root tips. Do not place tablets in the bottom of the hole. Complete topsoil backfill, tamp, water-in and mulch.
 - d. Fertilizer tablet application rates:
 - (1) Ground cover in 1 gal. size containers – place one (1) 5-gram fertilizer tablet per plant.
 - (2) Shrubs in 1 gal. size containers – place one (1) 21-gram fertilizer tablet per plant.
 - (3) Shrubs in 3 gal. size containers – place two (2) 21-gram fertilizer tablets per plant.
 - (4) Trees of varying sizes – place one (1) 21-gram fertilizer tablet for every ½” of caliper size.

I. Topsoil Amendments

1. Topsoil for planters, planting beds and tree pits shall be NJDOT approved, and supplemented with well-rotted manure or finished, screened leaf compost at a ratio of 2/3 topsoil to 1/3 manure or compost by volume.
2. Amended topsoil backfill shall be placed in all planters, planting beds and tree pits to a minimum depth of 2'-0", or to the full depth of the root balls whichever is greater.
3. Hydrophilic polymer crystals shall be added to the amended topsoil, to increase moisture retention as follows:
 - a. Basis of design: TeraGel (T-200) as manufactured by Terawet Ventures, San Diego, CA.
 - (1) Incorporate and thoroughly mix in, as an additional bulk amendment into the amended topsoil backfill, 2-1/2 lbs. (dry weight) of hydrophilic polymer crystals per cubic yard of amended topsoil.

- (2) In addition to the bulk application described above, add the following quantities of hydrophilic polymer crystals directly into the tree/plant pits when they have been backfilled to the half-way point:
 - (a) Ground cover in 6" size pots – no additional hydrophilic polymer crystals required.
 - (b) Shrubs in 1-gal. size containers – place and evenly distribute an additional 3 tsp. of hydrophilic polymer crystals.
 - (c) Shrubs in 3-gal. size containers – place and evenly distribute an additional 5 tsp. of hydrophilic polymer crystals.
 - (d) Trees 2"- 2 1/2" cal. size – place and evenly distribute an additional 3 tsp. of hydrophilic polymer crystals.
 - (e) Trees 2 1/2"- 3" cal. size – place and evenly distribute an additional 5 tsp. of hydrophilic polymer crystals.
 - (f) Trees 3 1/2" - 4' cal. size – place and evenly distribute an additional 7 tsp. of hydrophilic polymer crystals.

J. Lightweight Engineered Soil for Rooftop Planters

1. Basis of Design

- a. Provide products of "rooflite" certified green roof media, by Skyland USA, Landenberg PA.
- b. Provide 6" layer of "rooflite drain" lightweight granular drainage material in the bottom of all planters prior to the installation of the lightweight engineered soil.
- c. Provide "rooflite intensive ag" lightweight engineered soil, ~~to~~ Fill planters with lightly, uniformly compacted engineered soil to within 3" of the top of the planters.
- d. Mulch rooftop planters as described elsewhere.

METHODS OF CONSTRUCTION

- A. Turf: Not required.
- B. Groundcover, perennials and ornamental grasses: Groundcover, perennials and ornamental grasses shall be supplied in pots, and be at least one year old, with sufficient root growth to hold soil in place when removed from the pot.
- C. Trees and shrubs
 1. Trees and shrubs shall be planted immediately upon delivery to the job site. Trees and shrubs that cannot be planted the day of delivery shall be set on the ground and be well protected with a layer of wet saw dust of mulch and watered daily.
 2. Trees and shrubs shall be planted so that their original root crown is flush with, or slightly above, finish grade when in final vertical position. When tree and shrub pits/beds are backfilled approximately 2/3 full, water thoroughly, saturating the root ball, and eliminating all air pockets, before completing the backfilling process.
 3. All plants shall be mulched within two (2) days after planting.

4. All trees are to be staked and guyed using high quality commercial grade materials and techniques. Routine maintenance shall include the periodic tightening, adjusting and replacement of staking and guying materials. All stakes and guying materials are to be removed and properly disposed of by the Design-Builder upon completion of the two (2) calendar year maintenance period.
5. Pruning shall be done in accordance with standard horticultural practice, to preserve the health, natural character, form and symmetry of the plant material.
6. Upon completion of the landscape installation, the Design-Builder shall dispose of all refuse and surplus materials, equipment and appurtenances from the job site, and leave the entire area and public thoroughfares broom clean.

END OF SECTION G2080.00

SECTION G3000.00
LIQUID AND GAS SITE UTILITIES

PERFORMANCE

A. Basic Function

1. Provide the following site services:
 - a. Water supply: Means of distributing water from municipal system for all purposes required in buildings and on site.
 - b. Sanitary sewer: Means of removing liquid waste generated in buildings on site.
 - c. Storm sewer: Means of removing, controlling, and storing rainwater runoff from buildings and site areas.
 - d. Site elements of energy supply: Means of storing and distributing natural gas for energy-using services.
2. Where site services elements must also function as elements defined within another element group, meet requirements of both element groups.

B. Amenity and Comfort

1. Leakage: Provide distribution systems which are leak-free.
2. Accessibility: Provide clearances around components that are adequate for service and use.
3. Odor: Provide trap(s) at connection(s) between storm sewer and sanitary sewer.

C. Health and Safety

1. Safety hazards: Avoid using products that create safety hazards wherever possible; where services must involve flammable materials or hazardous operations, comply with code.
2. Unauthorized access: Provide locking devices to stop unauthorized access.
3. Excess pressure: Provide pressurized components that will withstand operational pressures without failure and to relieve or reduce excessive pressure to prevent failure.
4. Electrical shock: Isolate electrical conductors from personnel.
5. Accidental explosion: Provide equipment designed to withstand electromotive forces without catastrophic failure.
6. Misuse: Minimize misuse that could result in damage to property, injury, or loss of life.
7. Hazardous materials: Piping carrying flammable liquids and toxic materials clearly labeled.
8. Vermin resistance: Provide components that are resistant to the entry of rodents and insects.

D. Structure

1. Concealed or buried piping and components: Provide cover or concealment so that components are not subjected to damaging stresses due to applied loads.
2. Supports for piping and components: Support piping and components using the following:
 - a. Provide supports that allow movement of the pipe without undue stress on the piping, tubes, fittings, components, or foundations.
3. Seismic Protection
 - a. Provide flexible joints where differential movement is anticipated.
 - b. Provide seismic supports in compliance with local code requirements.

E. Durability

1. Weather Resistance
 - a. Storage tanks and distribution components: Prevent freezing. Provide automatically controlled supplemental heating where necessary.
 - b. Burial depth of piping: In accordance with code. Minimum burial depth is the deeper of 36 inches or 6 inches below lowest recorded level at which the ground freezes.
 - c. Electrical equipment: Provide equipment which is waterproof.
2. Corrosion resistance: Prevent corrosion by using corrosion-resistant materials, by preventing galvanic action, by preventing contact between metals and concrete and masonry, and by preventing condensation on metals.
 - a. Metals considered corrosion-resistant: Aluminum, stainless steel, brass, bronze, cast iron, ductile iron, malleable iron, hot-dipped galvanized steel, chrome-plated steel, cadmium-plated steel, and steel coated with high-build epoxy or coal tar-based paint.
 - b. Underground elements: Provide supplementary protection for underground metal pipes and tanks, sufficient to prevent corrosion completely, for the service life of the element without maintenance.
 - (1) 3 inches of concrete cover is considered to be permanent protection.
 - (2) Bituminous or other waterproof coating or wrapping is considered permanent protection unless cathodic protection is required and unless underground element is subject to movement due to structural loads or thermal expansion or contraction.
 - (3) Provide cathodic protection if any of the following is true; coatings or wrappings will not be considered sufficient protection for elements falling under these criteria:
 - (a) Metal elements are submerged or buried in a soil environment known to cause corrosion on similar nearby structures.
 - (b) Metal elements are submerged and buried in a soil environment in which stray DC electrical currents are present.

3. Resistance to Accidental Damage and Abuse
 - a. Provide barriers or protected locations for services, to prevent damage due to vehicular traffic.
 - b. Buried components: As required by code; minimum of 12 inches below surface of ground.
 - c. Underground piping: Watertight and rootproof.
 - d. Storm Grates and Inlets
 - (1) Provide storm grates and inlets with the strength to withstand repetitive loading without damage or undue wear.
 - (2) Provide storm grates and inlets with the strength to withstand concentrated loads up to 2000 psig.
 - (3) Provide storm grates which resist corrosion.
 - (4) Provide tamper-resistant anchors on grates and covers.
- F. Operation and Maintenance
 1. Capacity
 - a. Water and drainage: As required by code and as specified.
 - b. Heating, cooling, and ventilating: Provide site services sufficient to maintain interior environment within ranges specified.
 - c. Fire protection: As required by code and as specified.
 2. Service connections: Provide separate service connections for domestic water service and fire water service in a manner that complies with all codes and local utility requirements.
 3. Ease of use: Provide easy access to and working clearances around system components.
 4. Minimization of misuse: Provide locking devices to stop unauthorized access.
 5. Ease of Maintenance
 - a. Provide shutoff valves and backflow preventers as required by code and at utility service mains and service entry points.
 - b. Piping: Provide means of isolating portions of piping system, so that small portions may be shut down leaving the remainder in operation, by using isolation valves located so that drainage of the entire system is not required for repair.
 - c. Storm and Sanitary Sewer
 - (1) Maximum manhole spacing: 300 feet.
 - (2) Maximum cleanout spacing: 100 feet.
 - d. Provide drains and inlets with replaceable covers.
- G. See Paragraph G, Environmental Impacts, in Section G0000.00, Sitework, for environmental requirements and restrictions.

- H. All materials and installation shall comply with the most stringent regulatory requirements of authorities having jurisdiction.
- I. All utilities shall be designed and installed to meet HS20-44 loadings.

PRODUCTS

A. Sanitary Sewer

1. Pipe

- a. Use one or more of the following:
 - (1) Cast iron soil pipe and fittings, hub and spigot.
 - (2) PVC pipe and fittings.
- b. Do not use:
 - (1) Cast iron soil pipe and fittings, hubless.
 - (2) Concrete pipe.
 - (3) Clay pipe.
 - (4) Copper tube or pipe.
 - (5) ABS pipe and fittings.

2. Manholes

- a. Use one or more of the following:
 - (1) Prefabricated concrete.
 - (2) Poured-in-place concrete.

3. Sump Pumps

- a. Use one or more of the following:
 - (1) Submersible pumps.
 - (2) Sewage pumps.
 - (3) Grinder pumps.
- b. Do not use:
 - (1) Pedestal pumps.

- 4. Grease interceptor: Single heavy-duty commercial grease interceptor located outside the building in an underground, lined precast concrete pit with cover.

B. Storm Sewer

1. Pipe

- a. Use one or more of the following:
 - (1) Cast iron soil pipe and fittings, hub and spigot.
 - (2) Concrete pipe.
 - (3) PVC pipe and fittings.

- b. Do not use:
 - (1) Cast iron soil pipe and fittings, hubless.
 - (2) Clay pipe.
 - (3) Copper tube or pipe.
 - (4) ABS pipe and fittings.
- 2. Culverts
 - a. Use one or more of the following:
 - (1) Concrete pipes.
- 3. Storm Drains
 - a. Use one or more of the following:
 - (1) Cast iron.
 - (2) Stainless steel.
 - (3) Plastic.
 - b. Do not use:
 - (1) Bronze.
 - (2) Wrought iron.
- 4. Manholes
 - a. Use one or more of the following:
 - (1) Prefabricated concrete.
 - (2) Cast-in-place concrete.
- 5. Trench Drains
 - a. Basis of Design: Series R-4996 self-forming trench pan **as manufactured by Neenah Foundry, Neenah, WI**, sized as required, with Type Q grates at all locations within Play Areas and where required for barrier-free access, and bolted Type C grates elsewhere.

END OF SECTION G3000.00