STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY

32 E FRONT STREET
P.O. BOX 991
TRENTON, NJ 08625-0991
609-943-5955

Addendum #1

New Jersey Schools Development Authority
Office of Procurement
32 East Front Street
Trenton, NJ 08625
Phone: 609-858-2984
Fax: 609-656-4609

Date: **October 30, 2015**

PROJECT #: **WT-0022-B01**
New Trenton Central High School
Trenton Public Schools

DESCRIPTION: Addendum #1

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

NOTE that modifications to the following items will be shown as follows: additions in **bold and underlined** text; deletions in ~~*strikethrough and italics*~~.

1. **Extension of the Bidders' Questions Date:**

   The date for final submission of Bidders' Questions is changed from 2:00 pm, Friday, October 30, 2015 to 2:00 pm, Friday, November 6, 2015.

2. **Modifications to the Advertisement to Extend Date for Submission of Price and Technical Proposals:**

   a. The first two paragraphs of Subsection D of the "Procurement Submission Dates and Deadlines" section of the Bid Advertisement for this procurement shall be modified to extend the date for submission of Price and Technical Proposals, as follows:

      Procurement Submission Dates and Deadlines:

      D. Interested firms must submit a Technical Proposal, which provides responses to the non-price "other factors" evaluative criteria requirements of the RFP. The

Technical Proposals must be received by the NJSDA by **2:00 PM** on ~~*December 3, 2015*~~ **December 17, 2015.** Faxed or e-mailed submittals shall not be accepted.

Bidders must simultaneously submit a sealed Price Proposal which must be submitted with the Technical Proposal and received by the NJSDA by **2:00 PM** on ~~*December 3, 2015*~~ **December 17, 2015**. Faxed or e-mailed Price Proposals shall not be accepted. Any Technical or Price Proposals received after this date and time will be returned unopened. Technical Proposals and sealed Price Proposals shall be delivered to **Marty Taylor** at the NJSDA address below:

3. **Modifications to the Advertisement to Extend Date for Opening of Price Proposals:**

   a. Subsection E of the "Procurement Submission Dates and Deadlines" section of the Bid Advertisement for this procurement, shall be modified to extend the date for opening of Price Proposals, as follows:

      E. The sealed Price Proposals shall be publicly opened and read at a bid opening at the NJSDA office on ~~*December 17, 2015*~~ **January 7, 2015** at **2:00 PM.**

4. **Modifications to the Request for Proposals to Extend Date for Submission of Price and Technical Proposal:**

   a. **REVISE:** The fourth paragraph of Section 1.3 B.2 ("Technical Proposal"), as section was modified by previous addendum, shall be further modified as follows, to change the due date for submission of the Technical Proposal to **December 17, 2105**:

      2. Technical Proposal

      The Technical Proposals must be received by the NJSDA by 2:00 PM on ~~*December 3, 2015*~~ **December 17, 2015**. Faxed or e-mailed Submittals shall not be accepted.

   b. **REVISE:** The fourth paragraph of Section 1.3 B.3 of the RFP ("Price Proposal"), shall be modified as follows, to change the due date for submission of the Price Proposal to **December 17, 2015**.

      The Price Proposal must be sealed and submitted with the original Technical Proposal and received by the NJSDA by **2:00 PM** on ~~*December 3, 2015*~~ **December 17, 2015.** Faxed or e-mailed Price Proposals shall not be accepted.

B. CHANGES TO THE PROJECT MANUAL:

1. Not Applicable

C. CHANGES TO THE PERFORMANCE SPECIFICATIONS:

1. Volume 2 Modifications to Performance Specifications

a. **ADD:** Add PERFORMANCE SPECIFICATION Section B2010.40 "Curtain Wall Assemblies" dated October 30, 2015 included herewith as Attachment 1.1

b. **ADD:** Add PERFORMANCE SPECIFICATION Section "D2060.00 Special Systems" dated October 30, 2015 included herewith as Attachment 1.2.

c. **ADD:** Add PERFORMANCE SPECIFICATION "Element E Equipment and Furnishings" included herewith as Attachment 1.3.

d. **ADD:** Add PERFORMANCE SPECIFICATION "Element F Special Construction and Demolition" dated October 30, 2015 included herewith as Attachment 1.4.

e. **ADD:** Add PERFORMANCE SPECIFICATION "Element G Sitework" dated October 30, 2015 included herewith as Attachment 1.5.

D. CHANGES TO THE DRAWINGS:

NOTE that modifications in revised replacement drawings are clouded and annotated with a delta. Other revisions to drawings are as noted.

1. **REPLACE:** Replace Drawing CG-101 Conceptual Grading Plan, dated August 14, 2015 (Revised October 8, 2015), with Revised Drawing CG-101 Conceptual Grading Plan, Revision Date October 30, 2015, issued herewith as Attachment 1.6. All other plans, sections and elevations are modified accordingly by implication.

2. **REPLACE:** Replace Drawing CU-101 Conceptual Potable Water, Gas, Electric, and Sanitary Sewer Plan dated August 14, 2015 (Revised October 8, 2015), with Revised Drawing CU-101 Conceptual Potable Water, Gas, Electric, and Sanitary Sewer Plan, Revision Date October 30, 2015, issued herewith as Attachment 1.7. All other plans, sections and elevations are modified accordingly by implication.

3. **REPLACE:** Replace Drawing CU-102 Conceptual Storm Waste Management Plan, dated August 14, 2015 (Revised October 8, 2015), with Revised CU-102 Conceptual Storm Waste Management Plan, Revision Date October 30, 2015, issued herewith as Attachment 1.8. All other plans, sections and elevations are modified accordingly by implication.

4. **REPLACE:** Replace Drawing A-101 Overall First Floor Plan, dated September 29, 2015, with Revised Drawing A-101 Overall First Floor Plan, Revision Date October 30, 2015, issued herewith as Attachment 1.9. Accessible route symbols have been deleted for clarity. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

5. **REPLACE:** Replace Drawing A-101A Partial First Floor Plan Sector A, dated September 29, 2015, with Revised Drawing A-101A Partial First Floor Plan Sector A, Revision Date October 30, 2015, issued herewith as Attachment 1.10. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

6. **REPLACE:** Replace Drawing A-101B Partial First Floor Plan Sector B, dated September 29, 2015, with Revised Drawing A-101B Partial First Floor Plan Sector B, Revision Date October 30, 2015, issued herewith as Attachment 1.11. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

7. **REPLACE:** Replace Drawing A-101C Partial First Floor Plan Sector C & D, dated September 29, 2015, with Revised Drawing A-101C Partial First Floor Plan Sector C & D, Revision Date October 30, 2015, issued herewith as Attachment 1.12. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

8. **REPLACE:** Replace Drawing A-102 Overall Second Floor Plan, dated September 29, 2015, with Revised Drawing A-102 Overall Second Floor Plan, Revision Date October 30, 2015, issued herewith as Attachment 1.13. Accessible route symbols have been deleted for clarity. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

9. **REPLACE:** Replace Drawing A-102A Partial Second Floor Plan Sector A, dated September 29, 2015, with Revised Drawing A-102A Partial Second Floor Plan Sector A, Revision Date October 30, 2015, issued herewith as Attachment 1.14. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

10. **REPLACE:** Replace Drawing A-102B Partial Second Floor Plan Sector B, dated September 29, 2015, with Revised Drawing A-102B Partial Second Floor Plan Sector B, Revision Date October 30, 2015, issued herewith as Attachment 1.15. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

11. **REPLACE:** Replace Drawing A-102C Partial Second Floor Plan Sector C & D, dated September 29, 2015, with Revised Drawing A-102C Partial Second Floor Plan Sector C & D, Revision Date October 30, 2015, issued herewith as Attachment 1.16. Match lines have been adjusted for consistency. Other modifications as indicated. All other plans, sections and elevations are modified accordingly by implication.

12. **REPLACE:** Replace Drawing A-103 Roof Plan, dated September 29, 2015, with Revised Drawing A-103 Roof Plan, Revision Date October 30, 2015, issued herewith as

Attachment 1.17. All other plans, sections and elevations are modified accordingly by implication.

13. REPLACE: Replace Drawing A-302 Building Sections, dated September 29, 2015, with Revised Drawing A-302 Building Sections, Revision Date October 30, 2015, issued herewith as Attachment 1.18. All other plans, sections and elevations are modified accordingly by implication.

14. REPLACE: Replace Drawing A-601 Door and Window Elevations, dated September 29, 2015, with Revised Drawing A-601 Door and Window Elevations, dated October 30, 2015, issued herewith as Attachment 1.19. All other plans, sections and elevations are modified accordingly by implication.

15. REPLACE: Replace Drawing A-603 Storefront & Curtain Wall Elevations, dated September 29, 2015, with Revised Drawing A-603 Storefront & Curtain Wall Elevations, Revision Date October 30, 2015, issued herewith as Attachment 1.20. All other plans, sections and elevations are modified accordingly by implication.

16. REPLACE: Replace Drawing A-604 Storefront & Curtain Wall Elevations, dated September 29, 2015, with Revised Drawing A-604 Storefront & Curtain Wall Elevations, Revision Date October 30, 2015, issued herewith as Attachment 1.21. All other plans, sections and elevations are modified accordingly by implication.

17. REPLACE: Replace Drawing A-605 Curtain Wall Elevations, dated September 29, 2015, with Revised Drawing A-605 Curtain Wall Elevations, Revision Date October 30, 2015, issued herewith as Attachment 1.22. All other plans, sections and elevations are modified accordingly by implication.

18. MODIFY: Drawing A-701E Partial First Floor Plan Furniture Layout, dated September 22, 2015 shall be modified in accordance with Sketch SK-01 Theater Cosmetology Lab dated October 30, 2015, issued herewith as Attachment 1.23. All other plans, sections and elevations are modified accordingly by implication.

19. MODIFY: Drawing A-702A Partial Second Floor Plan Furniture Layout, dated September 22, 2015 shall be modified in accordance with Sketch SK-02 Cosmetology Lab dated October 30, 2015, issued herewith as Attachment 1.24. All other plans, sections and elevations are modified accordingly by implication.

20. MODIFY: Drawing A-702D Partial First Floor Plan Furniture Layout, dated September 22, 2015 shall be modified in accordance with Sketch SK-03 Digital Audio Lab dated October 30, 2015, issued herewith as Attachment 1.25. All other plans, sections and elevations are modified accordingly by implication.

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

1. Question: Upon review of the size and complexity of the Trenton High School project, Hall Construction respectfully requests that the Bid Due Date and Interviews be postponed for at least two weeks since many Subcontractors are not around Thanksgiving week and the following week. This will then ensure a very competitive bid prior to Christmas.

   Answer: Refer to Section A Changes to Procurement Process.

F. CHANGES TO PREVIOUS ADDENDA:

1. Not applicable.

G. ATTACHMENTS:

1. Attachment 1.1 Performance Specification Section B2010.40 Curtain Wall Assemblies, dated October 30, 2015.
2. Attachment 1.2 Performance Specifications Section D2060.00 Special Systems, dated October 30, 2015.
3. Attachment 1.3 Performance Specification Section Element E Equipment and Furnishings, dated October 30, 2015.
4. Attachment 1.4 Performance Specification Section Element F Special Construction and Demolition, dated October 30, 2015.
5. Attachment 1.5 Performance Specification Section Element G Sitework dated October 30, 2015.
6. Attachment 1.6 Revised Drawing CG-101 Conceptual Grading Plan, dated August 14, 2015 (Revised October 8, 2015), Revision Date October 30, 2015.
7. Attachment 1.7 Revised Drawing CU-101 Conceptual Potable Water, Gas, Electric and Sanitary Sewer Plan dated August 14, 2015 (Revised October 8, 2015) Revision Date October 30, 2015.
8. Attachment 1.8 Revised Drawing CU-102 Conceptual Storm Waste Management Plan, dated August 14, 2015 (Revised October 8, 2015), Revision Date October 30, 2015.
9. Attachment 1.9 Revised Drawing A-101 Overall First Floor Plan, dated September 29, 2015, with Revised Drawing A-101 Overall First Floor Plan, Revision Date October 30, 2015.

10. Attachment 1.10 Revised Drawing A-101A Partial First Floor Plan Sector A dated September 29, 2015, Revision Date October 30, 2015.

11. Attachment 1.11 Revised Drawing A-101B Partial First Floor Plan Sector B dated September 29, 2015, Revision Date October 30, 2015.

12. Attachment 1.12 Revised Drawing A-101C Partial First Floor Plan Sector C & D, dated September 29, 2015, Revision Date October 30, 2015.

13. Attachment 1.13 Revised Drawing A-102 Overall Second Floor Plan dated September 29, 2015, Revision Date October 30, 2015.

14. Attachment 1.14 Revised Drawing A-102A Partial Second Floor Plan Sector A dated September 29, 2015, Revision Date October 30, 2015.

15. Attachment 1.15 Revised Drawing A-102B Partial Second Floor Plan Sector B dated September 29, 2015, Revision Date October 30, 2015.

16. Attachment 1.16 Revised Drawing A-102C Partial Second Floor Plan Sector C & D dated September 29, 2015, Revision Date October 30, 2015.

17. Attachment 1.17 Revised Drawing A-103 Roof Plan dated September 29, 2015, Revision Date October 30, 2015.

18. Attachment 1.18 Revised Drawing A-302 Building Sections dated September 29, 2015, Revision Date October 30, 2015.

19. Attachment 1.19 Revised Drawing A-601 Door and Window Elevations, dated September 29, 2015 Revision Date October 30, 2015.

20. Attachment 1.20 Revised Drawing A-603 Storefront & Curtain Wall Elevations dated September 29, 2015, Revision Date October 30, 2015.

21. Attachment 1.21 Revised Drawing A-604 Storefront & Curtain Wall Elevations dated September 29, 2015, Revision Date October 30, 2015.

22. Attachment 1.22 Revised Drawing A-605 Curtain Wall Elevations dated September 29, 2015, Revision Date October 30, 2015.

23. Attachment 1.23 Modified Drawing A-701E Partial First Floor Plan Furniture Layout dated September 22, 2015, SK-01 Revision Date October 30, 2015.

24. Attachment 1.24 Modified Drawing A-702A Partial Second Floor Plan Furniture Layout dated September 22, 2015, SK-02 Revision Date October 30, 2015.

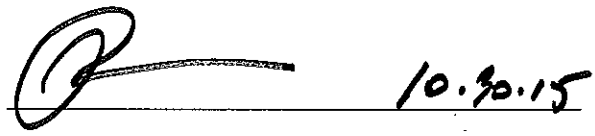
25. Attachment 1.25 Modified Drawing A-702D Partial Second Floor Plan Furniture Layout dated September 22, 2015, SK-03 Revision Date October 30, 2015.

H. SUPPLEMENTAL INFORMATION

1. Not Applicable.

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. 1



NJSDA 10.30.15 Date

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY

Addendum #1

New Jersey Schools Development Authority
Office of Procurement
32 East Front Street
Trenton, NJ 08625
Phone: 609-858-2984
Fax: 609-656-4609

Date: **October 30, 2015**

PROJECT #: **WT-0022-B01**
New Trenton Central High School
Trenton Public Schools

DESCRIPTION: **Addendum #1**

Addendum No. 1

Acknowledgement of Receipt of Addendum

Contractor hereby acknowledges the receipt of the Addendum by signing in the space provided below and returning via scanned copy (MATaylor@njsda.gov) or fax (609-656-4609). Signed acknowledgement must be received prior to the Bid Due Date. Acknowledgement of the Addendum must be made in Section E.5 of the Price Proposal Submission.

_____ _____
Signature Print Name

_____ _____
Company Name Date

ATTACHMENT 1.1

SECTION B2010.40

CURTAIN WALL ASSEMBLIES

I. PERFORMANCE

A. Basic Function

1. Fill, cover, close, or otherwise protect all glazed openings in the exterior walls (other than doors and window units) so that the entire exterior enclosure functions as specified, using glazed wall elements as specified.
2. 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 performance of elements forming exterior/interior separation: In accordance with code and all project requirements.
2. Air Infiltration: In accordance with code and all project requirements.
3. Acoustical performance: Comply with Performance Specifications Section PS1030.00 and all code requirements and referenced standards.

C. Appearance

1. Match sightlines, finishes and general appearance with window units unless clearly indicated otherwise.
2. Sight lines of glazed areas: Provide maximum glazing area with minimum interruption by framing members.
3. Frames: Construct frames of openings to give a flush appearance without shadow lines.

D. Health and Safety

1. Fire resistance: Rating as required to maintain fire resistance rating of exterior wall in which they occur.
2. Provide laminated safety glazing at Gymnasium and other areas subject to impact in the course of standard instructional activities.

E. Structure

1. Lintels: Constructed to span openings and support loads imposed by exterior wall; maximum deflection of 1/720 of span, vertically and horizontally.
2. Design and size curtain wall system components to withstand dead loads, live loads and wind loads caused by positive and negative wind loads acting normal to plane of wall, including building corners, and as required by code.
3. Uniform Load Deflection Test
   a. Test in accordance with ASTM E 330.
   b. Deflection under design load shall not exceed L/175 for spans less than 162" (4114 mm).

c. Deflection under design load shall not exceed L/240 +1/4" (6 mm) for spans greater than 162" (4114 mm).

4. Uniform Load Structural Test

a. Test in accordance with ASTM E 330 at 1.5 times positive and negative design wind loads using 10-second duration of maximum load.

b. At conclusion of the test there shall be no glass breakage, permanent damage to fasteners, curtain wall parts, or any other damage that would cause the curtain wall to be defective.

5. Expansion and contraction: Provide control of expansion and contraction caused by a cycling temperature range of 170 deg F over a 12-hour period without damage to system components.

F. Durability

1. Air and rainwater penetration: Minimize air and rainwater penetration and protect adjacent interior spaces from weather-related damage.

2. Thermal resistance: Provide a curtain wall system with maximum U-value of 0.48 Btu/sf/hr/deg F when measured in accordance with AAMA 507 using low-E glass.

3. Air Infiltration Test

a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (300 Pa).

b. Air infiltration shall not exceed .06 cfm/SF (.31 l/s•m²) of unit.

4. Water Resistance Test

a. Test unit in accordance with ASTM E 331 at an air pressure difference of 15.0 psf (720 Pa).

b. There shall be no water leakage as defined by AAMA 501.1, paragraph 5.5.

5. Condensation Resistance Factor

a. Test unit in accordance with AAMA 1503.1.

b. Condensation Resistance Factor (CRF) shall not be less than 53 (frame) and 58 (glass).

6. Drainage: Construct openings and components of openings to positively drain water to exterior of the building.

a. Drain water entering joints, condensation occurring in glazing channels, and/or migrating moisture occurring within system, to the exterior by means of a weep drainage network

b. Top of openings: If wall construction does not provide its own methods of drainage, use separate flashing to prevent water from entering opening components or the interior of the building.

c. Bottom of openings: Integral or separate sill or flashing to prevent water running over or draining out of opening components from entering the wall construction below or the interior of the building. Provide end dams and other components in compliance with manufacturer's requirements and Materials and Systems Standards.

G. Operation and Maintenance

1. Provide components that minimize requirements for maintenance during routine operations.

II. PRODUCTS

A. Basis of Design: Efco 5600, Kawneer 1600, or Wausau Superwall.

1. Provide minimum 4-1/2" frame depth and architectural sill extension, subsill and subframe.
2. Provide curtain wall, windows, storefront and associated doors of a single manufacturer.

B. Curtain wall finish: Clear anodic finish, AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

III. METHODS OF CONSTRUCTION

A. Field Quality-Control Testing

1. Retain an independent testing laboratory to perform field quality-control testing as follows:
   a. Water Penetration Test
      (1) Perform testing in accordance with AAMA 501.2 and ASTM E1105 before installation of interior finishes has begun.
      (2) Perform tests in a minimum of three test areas satisfactory to the Authority.
      (3) Perform tests in each test area as directed. Perform at least three tests, prior to 10, 35, and 70 percent completion.
      (4) In the event of water penetration, make corrections to system and re-perform tests until no leaks are present.

END OF SECTION B2020.00

ATTACHMENT 1.2

SECTION D2060.00

SPECIAL SYSTEMS

I. PERFORMANCE

A. Basic Function

1. Provide special systems as follows where indicated:
   a. Compressed air system.
   b. Retractable power cord reel systems.
2. Comply with the New Jersey Uniform Construction Code and all subcodes.
3. Where special systems also must function as elements defined within another element group, meet the requirements of both element groups.

B. Amenity and Comfort

1. Convenience: Provide equipment with fittings and controls that are manageable without the need for excessive force.

C. Structure

1. Provide suspended equipment that has been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.

D. Operation and Maintenance

1. Ease of Use
   a. Language of identifying devices: All text in English.
   b. Equipment with movable components: Easy to use without special instruction and designed to prevent misuse.
2. Ease of repair: Provide equipment that is designed to permit repair or replacement of individual components without removal of fixture.
3. Theft resistance: Provide equipment that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

E. 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.

II. PRODUCTS

A. Central Compressed Air System

1. Provide a complete, code-compliant compressed air system to serve the Engineering Lab and the Automotive Technology Lab, including the following:
   a. One rotary screw air compressor, located in the Mechanical Room adjacent to the Engineering Lab.
   b. Hard distribution piping from compressor to secondary regulator manifold in each lab.

c. Central controller with pressure and temperature gauges and isolation shut-off valves, wall-mounted in a readily accessible location adjacent to the compressor.

d. Secondary manifold and regulator in each lab space, with pressure and temperature gauges and isolation shut-off valves, wall-mounted in a location readily accessible for the instructor.

e. Hard distribution piping from secondary regulator to each hose reel location.

f. Flexible stainless steel hose connection from distribution piping to each hose reel.

g. Filters, accessories and safety features as required for a complete, energy-efficient and code-compliant system.

2. Air Compressor

a. Provide an integrated, high-efficiency rotary screw compressor sized for continuous, simultaneous operation of twelve stations at 120 psi, with the following:

(1) Premium efficiency IE3 motor.

(2) Microprocessor controller with high-resolution display.

(3) Sequential cooling system.

(4) Energy-saving, cycling refrigerated air dryer.

(5) High-efficiency coalescing filter.

(6) High-efficiency particulate filter.

(7) Integral air receiver storage tank.

(8) Integrated compressor and dryer controls.

(9) Low-pressure-drop piping.

(10) High-efficiency moisture separator.

(11) Sound level not more than 65 dBA.

b. Basis of Design: Ingersoll Rand.

3. Provide electronic controller for central flow and pressure control, with the following:

(1) High volume low pressure drop design.

(2) Electronic PID control of valve position.

(3) Mounted controller with digital interface.

(4) Mounted pressure transducer.

(5) 3-valve bypass.

(6) Taps and gauges for system audit instrumentation.

b. Basis of Design: IntelliFlow controller by Ingersoll Rand.

4. Air Hose Reels
   a. Provide twelve spring-driven heavy-duty hose reels (six in each lab), securely mounted to roof structure, with the following:
      (1) External fluid path with solid brass machined 90° full-flow NPT swivel inlet, with nitrile swivel seals.
      (2) Solid one-piece, heavy gauge ¼" steel base and support post.
      (3) 1" solid steel axle and lubricated precision bearings.
      (4) Controlled retraction speed.
      (5) Enclosed factory tuned and matched cartridge-style spring motor.
      (6) Non-corrosive stainless steel spring, pawl and zinc plated ratchet.
      (7) Multi-position lock ratchet mechanism to secure hose at desired length.
      (8) Feeder cord as necessary to reach to 6'-0" above floor.
   b. Provide each hose reel with 50' of 3/8" hose and standard quick-disconnect fitting.
   c. Provide overhead mounting brackets, bend restrictors, hose stops and all other accessories as needed for a complete installation.
   d. Basis of Design: P Series by CoxReels.
5. Distribution Piping and Fittings
   a. Provide a system of marine-grade aluminum piping and fittings specifically designed for use with compressed gases and a minimum working pressure of 220 psi.
   b. Basis of Design: SimplAir piping system by Ingersoll Rand.

B. Retractable Power Cord Reel System
1. Where indicated, provide spring-driven heavy-duty power cord reels mounted to roof structure, with the following:
   a. All steel construction, including mounting base.
   b. Slip ring rated for 600v/30a.
   c. Adjustable guide arm.
   d. Adjustable ratchet that can be engaged (positive lock) or disengaged (constant tension) as needed.
   e. Adjustable ball stop.
   f. Safety yellow case.
   g. 35' of 14/3 SJOOW cable and molded yellow duplex GFCI receptacle.
   h. Feeder cord as necessary to reach to 6'-0" above floor.
2. Provide power to reels from local power panelboard serving the room where the reels are located.
3. Provide overhead mounting brackets and all other accessories as needed for a complete installation.

4. Basis of Design: RTB Series by KH Industries.

III. METHODS OF CONSTRUCTION

A. Provide equipment that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

B. Construct special systems using the following methods:

1. Install all special systems and accessories in accordance with applicable codes and equipment manufacturers' recommendations.
2. Provide seismic restraints for piping as per code.
3. Provide UL listed fire-stop system for all pipe penetrations through fire-rated constructions.
4. Provide pipe sleeves for pipes passing through concrete walls, masonry walls, concrete floor slabs, and concrete roof slabs.

C. Compressed Air System

1. Mount the compressor on manufacturer's equipment rails and spring isolators on 4" housekeeping pad.
2. Start up and test system in full compliance with codes and manufacturer's recommendations.
3. Following satisfactory testing, clean and dry the system in accordance with manufacturer's recommendations.

END OF SECTION D3010.00

ATTACHMENT 1.3

ELEMENT E

EQUIPMENT AND FURNISHINGS

SECTION E1010.10

VEHICLE SERVICING EQUIPMENT

I. PERFORMANCE

A. Basic Function

1. Provide vehicle servicing equipment as indicated, constructed to achieve fire ratings required by code and all other project requirements.
2. Vehicle servicing equipment includes the following elements:
   a. Vehicle lifts.
   b. Vehicle exhaust capture system.
3. Where elements also must function as elements defined within another element group, meet 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. Amenity and Comfort

1. Convenience: Provide equipment with fittings and controls that are manageable without the need for excessive force.
2. Texture: Provide durable, low maintenance exposed surfaces for equipment that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.

D. Structure

1. Provide suspended equipment that has been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Seismic loads: Provide equipment that has been engineered and installed to withstand seismic forces that are greater than those required by code.
   a. Application: For design purposes, apply the component seismic force at the center of gravity of the component non-concurrently in any horizontal direction.

E. Operation and Maintenance

1. Ease of Use
   a. Language of identifying devices: All text in English.
   b. Equipment with movable components: Easy to use without special instruction and designed to prevent misuse.
2. Ease of repair: Provide equipment that is designed to permit repair or replacement of individual components without removal of fixture.
3. Theft resistance: Provide equipment that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

II. PRODUCTS

A. Vehicle Lifts

1. Provide six two-post vehicle lifts complying with all codes and industry standards and the following:
   a. Lift capacity: 10,000 lb.
   b. Symmetrical or asymmetrical operation.
   c. Two-handed lowering operation and keyed lockout safety button.
   d. Rise height: 74-1/8" with screw pads in highest position.
   e. Column height: 14'-8".
   f. Drive-through clearance: 104-1/2".
   g. Floor to overhead switch: 170-1/2".
   h. Motor: 2 hp, 208-volt three-phase.
   i. Speed of rise: 48 seconds.
2. Basis of Design: CL10V3-3-DPC by Challenger Lifts.

B. Vehicle Exhaust Capture System

1. Provide a complete, six-station, telescoping overhead exhaust capture system in compliance with all codes and industry standards and the following:
   a. Ducts: Round and airtight, of stainless steel sheet complying with code and SMACNA requirements and all other project requirements. Provide hard duct extension to 6'-0" above floor, supported and braced by stainless steel aircraft cable to structure above.
   b. Flexible exhaust hose: 0.012" minimum strip thickness stainless steel; provide 12'-0" hose length at each station.
   c. Tailpiece adapter: 20-ga. Stainless steel, with gas analyzer slot and spring clip.
   d. All permanent connections to metal flexible tubing shall be made with rivets, drive screws, or welds.
   e. Utility vent set: Provide roof-mounted unit and controls integrated with Building Management System and designed and manufactured for automotive exhaust capture use, and in compliance with requirements of Element D Services.
2. Size system for simultaneous operation of six large-size vehicle engines.
3. Basis of Design: Products of Eurovac or Ventaire.

III. METHODS OF CONSTRUCTION

A. Vehicle Lifts

1. Provide cast-in-place embedments for attachment of vehicle lifts.

END OF SECTION E1010.50

SECTION E1010.50

LOADING DOCK EQUIPMENT

I. PERFORMANCE

A. Basic Function

1. Provide loading dock equipment to facilitate loading and unloading of supplies and equipment and to protect personnel, building elements and vehicles from physical damage, and constructed to achieve fire ratings required by code and all other project requirements.
2. Loading dock equipment includes the following elements:
   a. Dock bumpers.
   b. Dock nosing.
3. Where elements also must function as elements defined within another element group, meet 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. Amenity and Comfort

1. Convenience: Provide equipment with fittings and controls that are manageable without special instruction or the need for excessive force.
2. Appearance: Provide equipment that is coordinated in design with other elements of interior construction, using compatible materials, colors, and textures.
3. Texture: Provide durable, low maintenance exposed surfaces for equipment that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.

D. Structure

1. Provide suspended equipment that has been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Seismic loads: Provide equipment that has been engineered and installed to withstand seismic forces that are greater than those required by code.
   a. Application: For design purposes, apply the component seismic force at the center of gravity of the component non-concurrently in any horizontal direction.

E. Operation and Maintenance

1. Ease of Use
   a. Language of identifying devices: All text in English.
   b. Equipment with movable components: Easy to use without special instruction and designed to prevent misuse.

2. Ease of repair: Provide equipment that is designed to permit repair or replacement of individual components without removal of fixture.
3. Ease of replacement or relocation: Provide equipment that is modular in form, detachable from substrate without damage to fixtures, and relocatable.
4. Theft resistance: Provide equipment that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

II. PRODUCTS

A. Dock Bumpers

1. Laminated Extra-Long Rubber Dock Bumpers
   a. Fabric reinforced rubber pads laminated between structural steel angles and secured with 3/4" (19 mm) steel supporting rods; anchor bolts protected by rubber.
   b. Projection from wall: 4" (152 mm).
   c. Vertical height: 12" (305 mm); 4" (102 mm) bolt hole centers.
   d. Length: As necessary to protect building where loading docks are not protected by bollards
   e. Finish for exposed metal: Hot-dipped galvanized.
   f. Anchor bolt protection: Minimum 3" thick rubber coverage.
2. Basis of Design: Durable Corp., Norwalk, OH.

B. Dock Nosing

1. Provide 4" wide cast-in-place non-skid nosing at all concrete loading dock edges not protected by railings.
   a. Basis of Design: Style AX Nosing, 5/16" thick with cross-hatched abrasive surface and integral cast anchors, as manufactured by Safe-T-Metal Company, Syracuse, NY.

III. METHODS OF CONSTRUCTION

A. Dock Bumpers

1. Provide cast-in-place embedments for attachment of dock bumpers.

B. Dock Nosing

1. Provide cast-in-place embedment for attachment of nosing.

END OF SECTION E1010.50

SECTION E1030.80
FOOD SERVICE EQUIPMENT

I. PERFORMANCE

A. Basic Function

1. Provide all new food service equipment and appliances as shown on the drawings and listed in the "Equipment Schedule" and as necessary for safe, sanitary and efficient food service and Culinary Arts facilities.
2. Food service equipment is comprised of the following elements:
   a. Fabricated equipment.
   b. Food waste machines.
   c. Cooking equipment.
   d. Self-contained refrigeration and warming equipment.
   e. Walk-in refrigeration equipment.
   f. Powered food-preparation equipment.
   g. Warewashing equipment.
   h. Serving equipment.
   i. Utility distribution systems.
3. Provide equipment that prevents the entry of food, vermin, dust, and dirt into crevices and concealed spaces; will not impart toxic substances, odors, colors, or tastes to food; is easy to clean, safe to use, and easy to service.
4. In addition to equipment and appliances scheduled and shown in drawings, provide the following as necessary to complete the installation of food service equipment:
   a. Electrical service and connection to food service equipment, including overload protection requirements wiring between starters, when starters and controls are not integral with equipment.
   b. Plumbing work and connections, including fittings which are not integral part of equipment; floor drains, water and waste lines to refrigeration compressors including their connections; and miscellaneous plumbing work.
   c. Heating, ventilating and air conditioning.
   d. Concrete, masonry and miscellaneous metals.
   e. Stainless steel corner guards attached to building structure.
5. Dining tables, chairs, cash registers, cashiers' stools, pots, pans, dishes, glassware, trays, and silverware will be provided by others.
6. Where food service elements also must function as elements defined within another element group, meet 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. Accessibility: Comply with barrier-free accessibility codes and requirements.
2. Noise reduction: Construct to minimize noise produced by equipment and reduce reverberation in spaces
3. Appearance
   a. Apparent cleanliness: Provide visible materials of uniform color, preferably light in color, for maximum visibility of food debris and dirt.
   b. Provide food service equipment that is consistent in appearance and finishes.
   c. Conceal wiring and piping wherever possible. Where wiring and piping are exposed, install horizontal and vertical runs close to walls, floors, ceilings or equipment.
4. Convenience
   a. In Cafeteria Kitchen, provide a layout and equipment consistent with convenience and efficiency in use, for food preparation staff and those being served.
   b. In Culinary Arts Labs, provide layouts and equipment consistent with effective teaching and learning.
   c. Install equipment so that food preparation, storage, service, and cleaning operations function smoothly, without unnecessary effort, and for optimum food hygiene

C. Health and Safety

1. Comply with all applicable codes and standards, including those of the National Sanitation Foundation.
2. Safety: Fabricate and install equipment to eliminate conditions that might snag, trip, tear, or otherwise injure food preparation staff and those being served.
3. Sanitation: Provide smooth, impervious, and water-resistant surfaces and equipment that will allow necessary cleaning and maintenance practices, including chemical cleaning and sterilization, without damage.
4. Safety of fire sources: Provide equipment that is certified by an independent testing agency recognized by the local authority for safety.
5. Flammability: Do not use any flammable materials in the construction of food service equipment.
6. Food safety: Maintain temperature inside chilled food storage units within ranges required by code and to prevent spoilage as follows:
   a. Refrigerators and refrigerated display units: Constant interior temperature of 45 deg F, plus/minus 5 deg F maximum.
   b. Freezers: Constant interior temperature of 25 deg F, plus/minus 5 deg F maximum.
7. Accident prevention: Construct to minimize misuse by food service personnel and prevent accidental misuse by other persons.

D. Structure

1. Items large enough to support a person: Strong enough to withstand such abnormal usage without failure.

2. Free-standing items: Anchored or sufficiently well-balanced to prevent overturning when fully loaded.
3. Provide seismic restraint and/or anchorage of equipment as required by code.

E. Durability

1. Service Life Span
   a. Appliances and operating equipment: Minimum of 15 years.
   b. Fixtures and non-operating components: Minimum of 50 years.
2. Surface durability: Provide only materials that will withstand normal wear-and-tear, including impact from mobile equipment, without significant deterioration over the specified life span.
   a. Provide stainless steel corner guards on all outside corners.
   b. Provide rubber wall bumpers on wall surfaces at Receiving Area and other exposed wall surfaces vulnerable to damage from moveable equipment.
3. Moisture resistance: Do not use any hygroscopic material.
4. Corrosion resistance: Do not use any exposed material that will corrode in the presence of moisture, unless finished with abrasion-resistant permanent coating that prevents passage of moisture vapor.
5. Rot and fungus resistance: Do not use any material, exposed or concealed, that will rot or grow fungus unless completely sealed with abuse resistant, moisture-resistant material.
6. Grease resistance: Do not use any material that attracts grease or air-borne dirt.
7. Cleanability: All surfaces within food service areas shall be smooth and easily cleanable.

II. PRODUCTS

A. Materials

1. Stainless steel, where specified, shall be Type 304, No. 4 finish.
2. Galvanized steel sheets shall conform to ASTM A164, Type RS. Where galvanized steel has been welded, seams shall be thoroughly cleaned and finished with one coat of zinc rich paint (70% zinc). Galvanized structural steel shall conform to ASTM A123 and A 153. Hot dip galvanization shall conform to ASTM A386.
3. Steel pipe shall be fully galvanized. All threads are to be cleaned and coated with rust resistant coating.
4. Structural shapes: All angles, band channels, etc., used for framing shall conform to ASTM A36.
5. Fastenings: All bolts, screws, nuts, and washers shall be galvanized or cadmium plated steel, except that where brass or stainless steel is fastened, the fastenings shall be brass or stainless steel respectively. Where dissimilar metals are fastened, bolts, screws, and nuts shall be made of an approved non-corrosive metal.

B. Workmanship

1. Fasteners

a. Except as otherwise specified or approved by the Authority, exposed finished surfaces shall be free from bolts, screws, and rivet heads.

b. Wherever threads of bolts and screws occur on the inside of fixtures and are either visible or might come in contact with hands or wiping cloths, such bolts and screws shall be capped with a suitable lockwasher and chrome plated brass or bronze acorn nut.

c. Where screw threads are welded to the underside of trim and tops, the spacing and intent of rivets, bolts, and screws shall be such as to insure proper fastening and prevent bulging of the materials fastened.

2. Welding

a. Welding shall be done by the electric fusion metal arc method. Carbon arc and gas welding will not be permitted.

b. Welds shall be continuous, strong, and ductile, with excess metal ground off joints finished smooth to match adjoining surfaces.

c. All joints in tops of fixtures, tables, drainboards, overshelving, sinks and other equipment shall be welded.

d. Butt welds made by spot welding straps under seams and filling in the voids with solder and finish by grinding, are not acceptable.

e. Tops of fixtures shall be fabricated in the factory with welded joints to reduce field joints to a minimum.

f. Field joints shall be welded and exposed welds ground smooth and polished to match factory finish.

3. Finish

a. Wherever material has been depressed by a welding operation, such depression shall be suitably hammered and peened flush with the adjoining surface and, if necessary, be ground again to eliminate low spots.

b. Care shall be exercised in all grinding operations to avoid excessive heating of the metal, causing discoloration. In all cases, the grain of rough grinding shall be removed by successive polishing operations.

c. Wherever brake bends occur, they shall be free of undue extrudence and shall not be flaky, scaly, and cracked in appearance. Where such bends mar the uniform surface appearance of the materials, all such marks shall be removed.

d. Sheared edges shall be free from burrs, fins, and irregular projections, and shall be finished to obviate all danger of cutting and laceration when the hand is drawn over the edge.

e. Mitres and bullnosed corners shall be welded.

4. Exposed Stainless Steel
    a. All surfaces shall have a No. 4 finish as specified hereinbefore. An exposed surface shall be interpreted as meaning outside surfaces exposed to view and inside surfaces exposed to view when a sliding or swinging door is opened.
    b. The underside of a shelf may be a No. 80 ground finish.
    c. Final finish shall be the manufacturer's factory finish and not as furnished by mill.
5. Underside of tops
    a. All work tops, dishtables and drainboards shall be treated with an approved spray on sound deadening material with an aluminum spray finish.
    b. Sound deadening shall be applied to fixtures after tops have been completely fabricated.
6. Soldering
    a. Soldering shall be done in strict accordance with recommended procedures of the stainless steel manufacturer.
    b. In no case shall soldering be relied upon for the stability of seams and joints. The soldering shall serve only as filler to prevent leakage, and shall not at any time be considered as replacing welding or brazing.
    c. Soldering shall not at any time be used in and on any surfaces which may come in contact with foods.
7. Control Devices
    a. All fittings, control valves, plumbing works, or electrical operating switches furnished as part of the equipment shall match and equal in every respect those required by code and all project requirements.
    b. Each piece of equipment shall have, in addition to mainline control valves, individual operating valves, so that any piece of equipment may be removed for repairs without interruption of the remaining apparatus.
    c. All such valves, switches, and fittings shall be located at a point of greatest convenience for operation.
8. Appurtenances and Access Panels
    a. Provide all appurtenances which may not be specifically mentioned in the specifications or shown on drawings but which are required for the proper functioning of the equipment.
    b. Include plumbing fittings or electrical controls which are not normally furnished by the manufacturer for the proper equipment functioning.
    c. Provide proper access panels to service equipment within the units.
9. Pipes, Fittings, and Valves
    a. Furnish all pipes, fittings, and valves required for proper functioning of equipment with the respective items of equipment.
    b. Furnish steam pressure reducing valves as required for steam operated units.

c. Exposed plumbing, piping, fittings, valves, and conduit shall be chrome plated.

10. Starting switches: Furnish starting switches including those for remote installation, to the Electrical Contractor, who shall install and wire same.

11. Equipment: All equipment shall be mechanically fastened to walls, floors, or ceiling and assembled together.

12. Protective coverings: All protective coverings shall be furnished and maintained for the protection of the equipment until ready for inspection and demonstration.

13. Field conditions: Where mechanical or structural field conditions have direct cause to alter equipment specified in any manner, notify the Authority in writing for direction before proceeding with that portion of the work.

C. Food Service Equipment

1. Fabricated Equipment

a. Fabricated equipment includes, without limitation, the following:

(1) Prep tables with sinks and drainboards.

(2) Dishtables.

(3) Work tables.

(4) Mixer and equipment tables.

b. Fabricated equipment shall be constructed of 14-gauge stainless steel and as follows:

(1) Joints shall be welded.

(2) Front and ends, unless otherwise indicated on drawings, shall be extended 3", measured at sink edge, and rolled 180° on a diameter of 2".

(3) All vertical and horizontal corners shall be rounded to a radius of approximately 1", with intersections meeting in the spherical sections.

(4) All penetrations in tables or countertops required to run mechanical services to any equipment shall be fitted with rubber grommets to protect these service lines.

(5) All troughs and drains related to tilting kettles and skillets shall be positioned in such a manner so as to fall within the pour pattern required.

(6) All corners of rolled rim shall be fully rounded outside roll and be concentric with inside roll.

(7) Prep tables

(a) Raised, rolled rim at front and ends of drainboard shall be leveled with sink rolled rim and continuous therewith, and shall not follow the pitch of the drainboard.

(b) Drainboards shall be pitched 1/8" per 1' 0" towards sink compartments.

(c) Sinks and drainboards adjacent to walls or adjoining equipment, shall have 10" high splashbacks, level and continuous, not following the pitch of drainboards.

(d) Where drainboards are 24" or less, they shall be supported on 1" outside diameter by 16-gauge stainless steel tubular, seamless diagonally braces and secured to sink gussets, welded around entire perimeter.

(e) Where drainboards exceed 24" in length, legs shall be provided.

(f) All sinks having two or more compartments shall have double dividing partitions with fully rounded corners, both vertical and horizontal.

(g) The bottom of each sink compartment shall be creased to a sufficient pitch toward waste outlet.

(h) Openings for hot and cold faucets shall be cut into splashbacks as required.

(i) All sinks shall be 16" deep, unless otherwise specified or indicated on the drawings.

(j) All divider panels where required shall be a minimum of 3/4" thick double wall stainless steel construction.

c. Waste Fittings

(1) Each sink compartment including bain-marie type sink compartments shall be provided with a waste outlet.

(2) Each waste outlet, except as otherwise specified, shall be a 2" twist handle valve constructed of the best grade chrome plated cast brass or bronze. Basis of Design: Component Hardware Model No. D50-4590.

(3) The outlet shall be free-flowing, non-clogging type, with a perforated strainer of stainless steel on the interior of the sink bottom and having 2" pipe size thread at the lower end, and shall provide chrome plated locknut washers and chrome plated tailpiece.

(4) The outlet shall bea precision-machined tee fitting protected by a sealed stuffing box which shall eliminate the possibility of leakage from key to exterior of outlet.

(5) The outlet shall be set into a die depression and attached without rivets to the sink bottom, and shall be furnished with externally operated stainless steel lever handles.

(6) The outer body shall have an opening threaded to receive 1-1/4" iron pipe size overflow at the rear. This overflow fitting shall be 1-1/4" brass chrome plated, and shall be provided with a stainless steel strainer on the sink interior and shall be connected to the waste outlet by means of 1-1/2" brass pipe tubing which shall be chrome plated, except as otherwise specified.

d. Sinks set into work counters or table tops shall be constructed of same gauge and materials as specified for counter top as follows:

(1) The top perimeter of each sink shall be integrally welded to edge of opening in table or counter top.

(2) Table or counter top shall be die punched to receive faucets.

(3) Sinks shall have vertical and horizontal corners rounded on a 1" radius, with bottoms pitched to the waste outlet.

(4) Sinks finish shall be the same as table or counter tops.

e. Water inlets shall be located in all instances above the positive water level to prevent syphoning of liquids into the water system.

f. Dishtables shall be constructed same as previously specified for sinks and drainboards unless otherwise indicated on drawings.

2. Work tables: All work tables shall be 14-gauge polished stainless steel constructed as follows:

a. Fabrication

(1) Edges shall be rounded and free from burrs and any excess material left.

(2) Tops shall be rolled 180° on a diameter of 2" on all exposed sides.

(3) Where tables are placed against building walls, they shall be turned up in back approximately 6", returned 1" diagonally to wall with all exposed ends welded closed.

(4) Corners shall be rounded or bullnosed.

b. Reinforcement and Underbracing

(1) Tops shall be reinforced with 1-1/2" x 1-1/2" x 1/8" galvanized iron angle framework reinforcing, full perimeter of underside of top, with cross angles every 30" or less.

(2) Reinforcing shall be secured to the underside of the top with stud welds, lockwashers, and speed nuts.

(3) Underbracing shall be provided for drainboards, and dishtable tops, and shall be 1" x 4" x 1" channels of 14-gauge stainless steel.

(4) Underbracing shall be welded to the underside of fixtures in a manner suitable to seal out vermin and also to create a noise deadening top surface.

(5) All channels shall extend the full length and depth of fixtures and shall be so positioned that no dimension exceeds 30" in any direction.

3. Legs

a. Legs shall be constructed of not less than 1-5/8" o.d., 16-gauge stainless steel pipe.

b. Legs shall be in no case spaced more than 6' 0" on centers.

c. Leg cross bracing, where required, shall be constructed of not less than 1-1/4" o.d. x 16-gauge stainless steel tubing.

d. All leg bracing shall run horizontal and level between all legs, approximately 10" above the floor, unless otherwise specified.

e. All joints shall be completely welded around the entire perimeter.

4. Leg Mountings

a. Units mounted on legs that are 14" or longer shall be provided with underbracing. Legs in such cases are to be provided with not less than 12-gauge stainless steel gussets, extending downward.

b. Gussets shall be die stamped, fully enclosed, drawn cylindrical or cone shaped of not less than 3" in length, 2-1/2" in diameter at top.

c. Gussets shall be welded continuously around entire circumference against the channel reinforcement.

d. On legs between 8" and 14" in height, gussets shall be provided, but no underbracing need be furnished.

5. Feet

a. Feet shall be stainless steel bullet type; integrally formed shaft with a minimum adjustment of approximately 1-1/2" without the use of threading or adjusting bolts.

b. Feet shall be completely sealed at bottom and shall be close-fitting between tubular leg support and foot.

c. Basis of Design: Component Hardware Model No. A10-0851.

6. Shelving and Undershelving

a. Counter shelves and cabinet shelves shall be constructed of 16-gauge stainless steel.

b. All shelves shall be of the removable type unless otherwise specified on drawings and constructed in sections of not more than 30".

c. Provide rigid attachment of back posts to the adjacent wall.

d. Rear of shelves shall be turned up 2" and hemmed.

e. Shelves shall be notched to fit the contour of legs.

f. Shelves shall be fully welded to legs, crevice free.

g. Flat undershelving shall be 16-gauge stainless steel turned down on front and sides approximately 1-1/2" and under 1/2" to form a channel shape.

h. Slotted undershelving is to be constructed same as above except that die stamped slots approximately 1 1/4" wide and 3" apart are to be furnished full length of shelf units running front to back.

i. Undershelves shall be reinforced with 1" x 4" x 1" 14-gauge stainless steel channel, full length of shelf.

7. Drawers

a. Drawers shall be of the telescoping slide type with completely enclosed 16-gauge stainless steel housing.

b. The housing shall operate on a 16-gauge stainless steel outside locking track.

c. Drawer fronts shall have 16-gauge stainless steel front panel with full grip pull handles.

d. Drawer fronts shall be double wall type construction filled with an approved sound deadener within.

e. Where specified, provide one 21" x 24" x 1" thick, white thermoplastic carving board to fit into stainless steel "Z" slides.

f. Drawer liners: Provide all drawers with fitted liners, removable without untracking, gray in color, smooth finish, all thermoplastic construction with all vertical and horizontal corners on a radius, with the top edges flanged out to set into a 16-gauge stainless steel track and housing combination.

g. Basis of Design

(1) Drawers: Component Hardware Model No. P50-1011, with M80 Series lock hasp and staple (sized to suit) and S52 Series heavy duty drawer slides.

(2) Carving board: John Boos Company.

(3) Drawer liners: Component Hardware.

8. Wall Cabinets

a. Wall cabinets shall be of length as shown on plans or hereinafter specified, 13″ deep x 30″ high or shown on drawings.

b. Construct cabinet of 18-gauge polished stainless steel, of all welded construction.

c. All cabinets shall have sloped, dust proof tops.

d. Exterior bottoms shall be of flush construction.

e. Cabinet interiors shall be provided with a fixed bottom shelf and two removable, adjustable, intermediate shelves.

(1) Shelves shall rest on clips, which shall be secured to keyhole strips fastened to interior of cabinet.

(2) Basis of Design

(a) Keyhole strips: Component Hardware Model No. T23 Series pilaster stainless steel removable thumbscrew type.

(b) Shelf clips: Component Hardware Model No. T30-5032.

f. Cabinet doors shall be of double wall construction.

9. Wall Shelves

a. Wall shelves shall be shall be constructed of 16-gauge stainless steel, turned up 2″ at both sides and rear, unless otherwise specified or shown on details.

b. Rear edges shall be hemmed.

c. Sides shall be fully welded and enclosed above and below shelf, flush with rolled edge.

d. Shelves shall be supported on 12-gauge stainless steel brackets spaced no more than 4′ 0″ o.c., welded to shelves.

10. Counter and Cabinet Doors

a. Doors shall be double pan construction with all corners welded and shall be filled with an approved 1/2″ thick sound deadener.

b. Doors shall be constructed of 18-gauge stainless steel exterior and 20-gauge stainless steel interior unless otherwise specified.

c. Doors shall permit removal for cleaning and adjustment without the use of tools.

d. Bolts and screws shall be kept to a minimum and shall be of corrosion resisting metal.

e. Sliding Doors

(1) Double sliding doors shall be provided with double overhead tracks and carriers for maximum clear door opening.

(2) Units shall be provided with trackless bottoms with concealed guide for overhead roller doors.

(3) Upper suspension nylon rollers shall be heavy duty to fit stainless steel track so as to minimize wear and noise.

(4) Doors shall operate on rollers freely without friction or rubbing between doors, door suspensions and upper sliding framework including hardware.

(5) Spacers, where not exposed to view, shall be 14-gauge 3/4" diameter stainless steel tubing.

(6) Guides shall be equipped with limit stops to prevent telescoping of doors.

D. Other Equipment

1. Walk-In Refrigerator/Freezer System

a. General

(1) Provide units and quantities as scheduled, designed with metal-clad modular panels to facilitate easy assembly and disassembly for relocation and expansion.

(2) Provide manufacturer's evaporator and condenser systems sized appropriately for each unit's size and configuration.

(3) Provide continuous floor finish run into cooler and freezer.

b. Accessories and features: Provide the following:

(1) Deadbolt lock(s) for all hinged doors, with safety release to prevent entrapment of personnel.

(2) Insulated, heated vision panel 14" x 14" in the center of each door.

(3) Full-width 36" high diamond tread kick plate on interior and exterior of lower portion of each door.

(4) Manufacturer's standard closer for each door.

(5) Incandescent vapor-proof light, with exterior neon pilot light and toggle switch and dual intensity attenuator to dim the lamp when the light switch is placed in the off position.

(6) A minimum of four ceiling-mounted incandescent vapor-proof lamps with exterior neon pilot light and toggle switch.

(7) One surface mounted dial thermometer with a range of -40 deg F to +100 deg F for each compartment.

(8) Audio-visual alarm with illuminated digital read-out for each compartment, with indicator light and horn alarm.

(9) Timed toggle switch at freezer door to shut down blower fan motor temporarily.

(10) Insulated freezer drain line heater.

(11) Seal-off fittings to prevent condensation in electrical junction boxes; one (1) fitting for each penetration of conduit through refrigerator and freezer walls, partitions and ceilings.

(12) Trim sections of the same material and finish of the exterior walls between top of refrigerator and finished ceiling and at ends where boxes abut masonry walls and partitions, louvered for proper ventilation of compressors.

(13) Double bumper rails on all exposed sides, at 18" and 36" above finished floor.

(14) Code-compliant metal housekeeping and safety release procedure placard.

c. Testing: Each system shall be cleaned and dehydrated by maintaining a vacuum of 500 microns or lower, for a minimum period of five hours. The vacuum pump used shall itself be capable of developing a vacuum of 50 microns with its valve in a closed position. The required operating charge of refrigerant and oil shall then be added and each system shall be tested for performance.

2. Roll-In Refrigerator, Freezer and Heated Cabinet

   a. Provide units and quantities as scheduled, complete with stainless steel exterior and interior for each unit.

3. Convection Steamer

   a. Provide units and quantities as scheduled, complete with stainless steel base cabinet, compartment door steam shut off, stainless steel base frame, low water protection, boiler descaling pump kit and water filter.

4. Steam Kettle

   a. Provide units and quantities as scheduled, complete with kettle markings, spring-assist cover, basket strainer, double faucet and 2" tangent draw-off valve.

5. Tilting Skillet

   a. Provide units and quantities as scheduled, complete with base-mounted gas-fired boiler for self-generated steam supply, 2" tangent draw-off valve, stainless steel cover, food strainer, and double water faucet.

   b. Provide pantry filler and power tilt with manual override.

   c. Locate skillet so that pour path is over floor trough.

6. Convection Oven

   a. Provide units and quantities as scheduled, with solid-state digital controls, rear gas connection with quick disconnect, stainless steel back panel, and 4" casters with front brakes.

7. Heavy-Duty Range
   a. Provide units and quantities as scheduled, with stainless steel main back, rear gas connection with quick disconnect, end caps and cover, 17" stainless steel backguard, and 4" casters with front brakes.
      (1) Provide salamander where scheduled, attached to range with reinforced back riser.
      (2) Provide 22" back riser for units without salamander.
8. Double Pizza Oven
   a. Provide units and quantities as scheduled, with casters, 36" stainless steel gas hose with quick disconnect, vent kit, double stacking connector, and steam jets.
      (1) Provide 1-1/2" thick, stone pizza-type shelves for each oven.
9. Double Impinger
   a. Provide units and quantities as scheduled, with double stacking connector, 50" extended conveyor and crumb pan.
10. Food Warmers
   a. Provide units and quantities as scheduled, with 14" sneeze guards.
11. Exhaust Hood—Type 1
   a. General
      (1) Dimensions: Approximate lengths and depths as shown, 2'-6" high, with 10" high exhaust duct collars and 5" high supply collars.
      (2) Ventilators shall be of the high-velocity, dry centrifugal extractor type.
      (3) Ventilators shall be U.L. listed under the category Grease Extractors for Exhaust Ducts, U.L. 710, in compliance with all recommendations of the National Fire Protection Association's standards for kitchen cooking equipment ventilators, approved by the National Sanitation Foundation, approved by IMC and ICBO, and be in accordance with all applicable codes and project requirements.
      (4) Ventilators shall be constructed of all stainless steel, #18 gauge (swg), type 201 #4 finish, all welded, grease- and water-tight.
      (5) Ventilators shall be mounted no more than 7'-0" AFF.
      (6) All ductwork must be built and installed in accordance with NFPA 96 and all code requirements.
   b. Accessories and Features: Provide the following:
      (1) Interior end panels cut out for continuous capture.
      (2) Centrifugal grease extraction chamber with full-length baffles located within the path of the high velocity air passing through the chamber.
         (i) Grease extraction efficiencies shall be not less than 95%.
         (ii) All extractor cartridges shall be fully removable from the floor by means of an extractor removal tool.

(3) Pitched trough with a removable grease collection located at one end.

(4) Fully insulated supply plenum with duct collar/fire damper assemblies and full length 40% open stainless steel fascia panels for discharge of tempered make-up air directly into the room space.

(i) Percentage of make-up air shall not exceed 80% of the exhaust volume.

(ii) Supply air shall discharge at no more than 250 FPM.

(iii) Discharge temperature to be approximately 65 deg F.

(5) Exhaust duct collar fire damper utilizing fusible link type detectors.

(6) Hanger brackets at front and rear, for support from building overhead.

(7) Removable stainless steel perimeter enclosure panels, 30" maximum height.

(8) Four 48" long double tube vaporproof and greaseproof fluorescent light fixtures.

(9) Complete wet chemical type fire protection system, Ansul R-102 or approved equal, and as follows:

(i) Means for automatic and manual activation.

(ii) Means for simultaneous automatic shutting down of protected cooking equipment upon activation of said system.

(iii) Design to provide surface, plenum and duct collar protection only.

(iv) All exposed piping to be stainless steel or chrome plated.

(v) Fusible link detection system built into ventilator sections by ventilator manufacturer; recessed into top of hoods with no visible conduit.

(vi) Manual actuation by readily accessible and plainly marked remote manual release station in each cooking area, located no less than 54" and no more than 78" above floor.

(vii) Liquid agent stored in containers equipped with pressure gauge to verify operational readiness.

(viii) Nozzles located in plenum and duct work, capable of functioning with heavy accumulation of grease.

(10) Automatic solenoid type gas shut-off valve in gas line supplying cooking appliances under the ventilator, interconnected with gas valve to fire suppression system.

(11) Provision to shut off gas and electric supply to all cooking equipment upon actuation of the system.

(12) Ventilator shall include interlock controller with built-in 1-hour delay cool-down timer. Interlock shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation or the exhaust fan shall occur through the interlock with the cooking appliances, by means of heat sensors located at each exhaust collar, or other approved methods meeting requirements of IMC.

c. Provide matching control panel as scheduled.

12. Exhaust Hood—Type 2
    a. Provide Type 2 hoods where indicated or where required for extraction of high heat and/or moisture and condensation.
    b. Provide custom pant-leg exhaust duct accessory for all warewashers, with size as required for specific equipment.
        (1) Provide all-welded stainless steel construction.
        (2) Extend pant-leg duct 7" minimum above finish ceiling.
        (3) Provide welded stainless steel ductwork to dedicated exterior exhaust fan with controls interlocked to operation of ware washer.
13. Ice Machine
    a. Provide air-cooled ice maker and storage bin as scheduled, with wall-mounted cartridge-type in-line filter system.
14. Unit Storage
    a. Provide shelving, can racks, dunnage racks and other storage items in units and quantities as scheduled.
    b. Provide unit storage of stainless steel construction with antimicrobial epoxy finish.
    c. Unless otherwise scheduled, provide shelving units complete with four electroplated posts and five louvered shelves per unit.
15. Roll-In Racks
    a. Provide units and quantities as scheduled, complete with plastic transport covers for each unit.
16. Garbage Disposer
    a. Provide units and quantities as scheduled, with auto-reversing, dual-solenoid water-saving controller.
17. Tray and Silverware Dispenser
    a. Provide units and quantities as scheduled, with locking casters and stainless steel silverware cylinders.
18. Serving Line Units
    a. Provide units and quantities as scheduled, with all stainless steel finishes.
    b. Provide solid 3-ribbed tray slides as indicated.
    c. Provide matching sneeze guards with fluorescent or LED lighting.
    d. Provide duplex outlet, network data connection and tubular foot rest at each cashier's station.
19. Milk Cooler
    a. Provide units and quantities as scheduled, with all stainless steel exterior and interior.

20. Other Equipment
    a. Provide units and quantities as scheduled and indicated. Provide stainless steel where material or finish options are available.

E. Handles, Brackets, Locking Devices and Hardware
1. Handles, knobs, hinges, brackets, or other miscellaneous hardware shall be satin finish chrome plated or stainless steel.
2. Pull handles shall be barrier-free and of the full grip type.
3. Locks
    a. All sliding and hinged doors and all drawers in tables, cabinets, refrigerators, storage bins, shall be furnished with extra heavy duty security type locking devices of cylinder type, chrome plated, as manufactured by Component Hardware or approved equal.
    b. Keying for all locking devices shall be consistent with Project School District standards.
4. Hinges and Catches
    a. All stainless steel hinged doors shall be provided with stainless steel lift off type hinges and adjustable tension type catches.
    b. Hinges and catches shall be fully mortised into doors and corresponding mullions to create a flush, clean appearance.
5. Casters
    a. All mobile stands, tables, and moveable equipment shall be provided with heavy-duty casters.
6. Basis of Design
    a. Pull handles: Component Hardware Model No. P50-1011.
    b. Hinges: Component Hardware Model No. R74-8100 and R74-8101.
    c. Catches: Component Hardware Model No. M27-2490.
    d. Casters
        (1) Kitchen: Component Hardware Model No. C25-1950 caster with Model No. C25-1951 brake.
        (2) Dishwashing area: Component Hardware Model No. C23-3450 caster with Model No. C23-3451 brake.

F. Motors and Electrical Characteristics
1. Motors
    a. Motors shall be of the drip proof, splash proof, or totally enclosed type having a two hour duty cycle and ball bearings (except small timing motors which may have sleeve bearings).
    b. All motor windings shall be impregnated to resist moisture.

c. Motors shall have ample power to operate designated machinery under full load operating conditions without exceeding nameplate ratings.

d. Fractional horsepower motors 1/2 HP and above shall operate on 208-volt, 3-phase, 4-wire service, with a magnetic pushbutton unless otherwise called for in equipment schedule.

e. Motors 1/3 HP and under shall operate on 120-volt 60-cycle, single-phase service.

(1) For devices requiring automatic operation, provide magnetic switching with manual reset.

(2) For other devices, provide manual starting switch with thermal overload.

2. Heating Elements

a. Provide an interconnected switch and pilot light for each separate heating element required for operation of kitchen equipment

b. Where a single element has a three-position setting, provide switch with a multiple setting consisting of high, medium, low and off positions.

3. Portable equipment: Electrically operated portable equipment shall have a ground wire and a polarized plug approved for use with the type of receptacle provided.

G. Faucets, Valves and Fittings

1. Each dishwashing machine shall have a pressure regulator valve set for twenty pounds discharge pressure. Valves shall be self-regulating and shall have a manual adjustment range between 15 and 30 pounds. Valve bodies and working parts shall be of brass.

2. Provide an approved anti water hammer device for dishwashing machine, consisting of synthetic rubber chamber cased in steel housing. Devices utilizing air chambers or coiled copper tubing shall not be accepted.

3. Basis of Design for faucets: T & S Brass and Bronze Works, Inc. as follows:

a. Kitchen

(1) Backsplash mounted: Model No. B-231.

(2) Deck mounted: Model No. B-221.

(3) Bain-Marie: Model No. B-207

b. Servery

(1) Backsplash mounted: Model No. B-1127.

(2) Deck mounted: Model No. B-1122.

4. Basis of Design for hand sink integral in counter: Component Hardware Model No. K11-4000-WH, with Model No. E32-4900 strainer type waste outlet.

H. Miscellaneous Accessories

1. Provide plastic transport covers for all mobile rack units.

I. Substantiation

1. Shop drawings shall be submitted in accordance with requirements of the Agreement and as follows:

   a. Floor plans of all food service and Culinary Arts spaces, showing detailed dimensions for utility lines and equipment, to a scale of 3/8" = 1' 0".

   b. Elevations of all food service equipment lines.

      (1) Include elevations of all exposed faces and ends.

      (2) Indicate detailed horizontal and vertical dimensions for all equipment and utility lines, to a scale of 3/8" = 1' 0".

   c. Floor plans, showing detailed dimensions for elevated bases, floor depressions, wall openings, locations of partitions and wall reinforcing as related to equipment supplied under this Section, to a scale of 3/8" = 1' 0".

   d. Dimensioned equipment construction drawings, indicating reinforcement, anchorage and other work required for completion and installation of equipment under this Section, to a scale of 3/4" = 1' 0".

2. Samples shall be submitted in accordance with requirements of the Agreement and of the following components:

   a. Leg assembly, with gusset, foot, and crossrail.

   b. Corner of table top.

   c. Drawer assembly.

   d. Section of hinged door.

   e. Corner of Serving Counter.

   f. Handles and hardware (hinges, catches, etc.).

   g. Corner of trayslide.

III. METHODS OF CONSTRUCTION

A. Protection of Work

1. Cover and protect the exposed surfaces of such equipment in a manner that shall preclude injury to the finish by absorption of oil, grease, chemicals, etc., contact from tools and machinery, and from all other causes which may be incidental to operation performed in the area.

B. Cleaning

1. Clean each item of equipment so that all traces of grease, stains, protective coatings, abrasive dust, markings, scratches, and other foreign matter are completely removed.

   a. Eliminate the need for any further cleaning with the exception of that which would ordinarily be undertaken daily to maintain accepted standards of sanitation and appearance.

C. Testing

1. Provide necessary technicians, materials, and equipment required to perform all tests on equipment.
2. Perform all tests in the presence of the Authority, the Project School District and the authorized representative of the respective manufacturer.
3. Correct all defects disclosed by the tests.

D. Warranty and Maintenance

1. Warranty and maintenance service shall be provided for a period of one year from occupancy and include the following:
   a. Adjustment of all equipment.
   b. Repair or replacement of electrical and mechanical parts of the equipment, using only genuine standard parts produced by the manufacturer.
   c. Renewals and repairs, as necessary, due to ordinary wear and tear.
2. All work under this maintenance and call back provision shall be performed by competent personnel under the manufacturer's supervision. Work shall be done during the regular working hours and days, but local call-back emergency service shall be available at all times.
3. For the refrigeration systems, local service on a twenty-four-hour call basis shall be provided for a period of one year from date of initial startup.
4. In addition to the above, all hermetically sealed units shall be furnished with a warranty for a period of five years from initial startup.

E. Training and Manuals

1. Properly trained authorized personnel shall demonstrate to the Project School District's operators the operation of all equipment including refrigeration systems.
2. Four (4) complete printed copies of the instructions shall be furnished to the Project School District in accordance with the requirements of Division 1, covering the operation and maintenance of all equipment. This information shall be submitted in the following manner for initial review by the Authority prior to use by the Project School District:
   a. A covered, bound booklet containing manufacturers' current printed manuals for all equipment hereinafter specified, including all accessories, components, faucets, etc.
   b. Each manual shall be clearly labeled with its respective item number designation as hereinafter specified.
   c. Booklet shall include a Table of Contents listing each equipment item included within the booklet, complete with corresponding item number, quantity and description as hereinafter specified.
   d. Booklet shall also include a Service Agency Listing including the complete name, address and phone number of the local Service Agency for all equipment included within the booklet.

END OF SECTION E1030.80

SECTION E1040.10

EDUCATIONAL AND SCIENTIFIC EQUIPMENT

I. PERFORMANCE

A. Basic Function

1. Provide educational and scientific equipment as required for fulfillment of the Educational Specifications and functioning of the program spaces, constructed to achieve fire ratings required by code and all other project requirements.
2. Educational and scientific equipment includes the following elements:
   a. Motorized projection screens.
   b. Laboratory fume hoods.
   c. Demonstration observation cameras.
   d. Laboratory chemical storage cabinets
   e. Combination fire extinguisher/fire blanket cabinets.
   f. First aid cabinets.
   g. Goggle cabinets.
   h. Kilns.
   i. Sensory equipment suspension panels.
   j. Kitchenette sink, cabinets and stove.
3. Where elements also must function as elements defined within another element group, meet 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. Amenity and Comfort

1. Accessibility: Provide equipment that is easily usable by disabled persons without outside assistance.
2. Light and glare: Provide equipment that is not a source of direct or reflected glare.
3. Convenience: Provide equipment with fittings and controls that are manageable without special instruction or the need for excessive force.
4. Appearance: Provide equipment that is coordinated in design with other elements of interior construction, using compatible materials, colors, and textures.
5. Texture: Provide durable, low maintenance exposed surfaces that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.
2. Health and safety: Provide safety features as required by code and manufacturer's standards for school use.

D. Structure

1. Provide equipment that has been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Seismic loads: Provide equipment that has been engineered and installed to withstand seismic forces that are greater than those required by code.
    a. Application: For design purposes, apply the component seismic force at the center of gravity of the component non-concurrently in any horizontal direction.

E. Operation and Maintenance

1. Ease of Use
    a. Language of identifying devices: All text in English.
    b. Equipment and safety features: Easy to use without special instruction and designed to prevent misuse.
    c. Hinges and latches: Heavy duty hardware, easily adjustable, providing minimum anticipated service life of 20 years.
    d. Mechanical controls: Motors, movable cranks, rotors, pulleys, and levers designed for trouble-free operation over a minimum anticipated service life of 20 years.
2. Ease of repair: Provide fixed furnishings at all locations that are designed to permit repair or replacement of individual components without removal of fixture.
3. Ease of replacement or relocation: Provide equipment at all locations that is modular in form, detachable from substrate without damage to fixtures, and relocatable.
4. Theft resistance: Provide equipment at all locations that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

II. PRODUCTS

A. Motorized Projection Screens

1. Provide one recessed ceiling-mounted motorized projection screen in each space as indicated and as applicable to the Project.
2. Size each projection screen as appropriate for the specific space, projection distance and viewing area.
3. Coordinate the surface material, finish and equipment with the room/space design, lighting, and sound reinforcement equipment, for optimum viewing at all normal seating locations, without hot spots, loss of resolution, excessive dimming of image, or difficulty of hearing.
4. Visual Properties of Projection Screens
    a. Contrast and resolution sufficient to provide accurate viewing at all normal seating locations in the room or space.
    b. Ambient light rejection as required to provide minimum gain specified under design lighting conditions
5. Basis of Design: Professional Electrol by Da-Lite.

B. Laboratory Fume Hoods

1. Basis of Design

a. Labconco Model #6970401.

b. Manufacturer's standard accessories:

(1) Work surface with spill recess.

(2) Hot and cold water faucet with cupsink, cover and lead trap.

(3) Duplex electrical receptacle.

(4) Storage base with ventilation and shelf, for barrier-free mounting height, vented in accordance with code.

(5) Sash stop kit.

(6) Digital air flow monitor with audiovisual alarm and alarm mute.

(7) Night setback capability.

(8) By-pass air capability for constant volume flow rate and constant face velocity.

2. Provide complete, code-compliant ventilation system in accordance with requirements of Element D.

C. Demonstration Observation Cameras

1. Provide each laboratory fume hood and demonstration station with a ceiling-mounted high-definition digital camera with connection to large-format display system and remote pan/tilt/zoom.

D. Laboratory Chemical Storage Cabinets

1. Basis of Design: Eagle Manufacturing Company, Wellsburg WV 26070; Models No. 2310 (flammables) and CRA-2310 (acids and corrosives), vented in accordance with code.

E. Combination Fire Extinguisher/Fire Blanket Cabinet

1. Basis of Design: Model FB-3612 by Total Lab Solutions, recessed mounting, with extinguisher, blanket and die-cut lettering.

F. First Aid Cabinet

1. Basis of Design: Sheldon Model 66109.

G. Goggle Cabinet

1. Basis of Design: Model TLS-H75 by Total Lab Solutions, wall-mounted.

H. Kilns

1. Basis of Design: L+L Kilns Model #SM23T-3 with downdraft vent.

2. Provide complete, code-compliant ventilation system in accordance with requirements of Element D.

I. Sensory Equipment Suspension Panel

1. Basis of Design: Sensation Station Panel #1298880, 39" x 55", by School Specialty, Appleton, WI.
2. Attach panel firmly to structure above ceiling.

J. Kitchenette sink, cabinets and stove

1. Provide sink and storage units consistent with Sections C1090.70, D2010.60, and project requirements.
2. Provide 30" induction slide-in range and oven with stainless steel finish.
   a. Provide matching canopy hood consistent with the requirements of code and Element D.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION E2010.00

SECTION E1070.00

ENTERTAINMENT AND RECREATIONAL EQUIPMENT

I. PERFORMANCE

A. Basic Function

1. Provide entertainment and recreational equipment as required for fulfillment of the Educational Specifications and functioning of the program spaces, constructed to achieve fire ratings required by code and all other project requirements.
2. Entertainment and recreational equipment includes the following elements:
   a. Stage equipment, including:
      (1) Curtains and rigging.
      (2) Lighting and controls.
      (3) Sound system.
   b. Athletic equipment, including:
      (1) Gymnasium divider curtain.
      (2) Basketball backboards, fixed and retractable where indicated.
      (3) Volleyball system.
      (4) Batting cage.
      (5) Climbing Wall.
      (6) Wall pads.
   c. Gymnasium scoreboard, shot clocks and controller.
   d. Locker Room benches.
3. Where elements also must function as elements defined within another element group, meet 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. Amenity and Comfort

1. Accessibility: Provide equipment that is easily usable by disabled persons without outside assistance.
2. Light and glare: Provide equipment that is not a source of direct or reflected glare.
3. Convenience: Provide equipment with fittings and controls that are manageable without special instruction or the need for excessive force.
4. Appearance: Provide equipment that is coordinated in design with other elements of interior construction, using compatible materials, colors, and textures.
5. Texture: Provide durable, low-maintenance exposed surfaces that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.

D. Structure

1. Provide suspended equipment that has been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Seismic loads: Provide equipment that has been engineered and installed to withstand seismic forces that are greater than those required by code.
   a. Application: For design purposes, apply the component seismic force at the center of gravity of the component non-concurrently in any horizontal direction.

E. Operation and Maintenance

1. Ease of Use
   a. Language of identifying devices: All text in English.
   b. Equipment with movable components: Easy to use without special instruction and designed to prevent misuse.
   c. Hinges and latches: Heavy-duty hardware, easily adjustable, providing minimum anticipated service life of 20 years.
   d. Mechanical controls: Motors, movable cranks, rotors, pulleys, and levers designed for trouble-free operation over a minimum anticipated service life of 20 years.
2. Ease of repair: Provide equipment that is designed to permit repair or replacement of individual components without removal of fixture.
3. Ease of replacement or relocation: Provide equipment that is modular in form, detachable from substrate without damage to fixtures, and relocatable.
4. Theft resistance: Provide equipment that is attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

II. PRODUCTS

A. Stage Equipment—General

1. Engage a professional theater design consultant with an established record of successful design and execution of theaters of comparable size and complexity, to design, specify and oversee the construction, installation and testing of all theater components in the Auditorium and the VPA Learning Resource Center.
2. Engage a qualified professional engineer to design and certify stage curtain and rigging systems, including comprehensive engineering analysis and attachments to building structure.
3. Engage a qualified theatrical equipment contractor with certified riggers, in accordance with the Entertainment Technician Certification Program. A minimum of two certified riggers shall be required, with at least one certified rigger acting as overall project manager.
4. Provide systems and products of a single manufacturer for each stage equipment system.

5. The Design-Builder is required to provide safe, complete, fully functioning stage systems in accordance with codes, industry standards and the guidelines in this section. Where dimensions and loading capacities have been omitted from this specification, they are to be determined Design-Builder's professional theater design consultant in accordance with codes and industry standards.

B. Stage Curtains and Rigging

1. General

a. All equipment, turnbuckles, clips, tracks, chains and other items of incidental hardware shall be furnished with the manufacturer's standard plated or painted finish.

b. Mule blocks, cable rollers and guides shall be installed, as required, to provide proper alignment and to maintain specified fleet angles.

c. Sheaves shall run plumb and true and shall not scrape housings.

d. Minimum safety factors shall be consistent with code requirements, industry standards and the following:

(1) Wire rope and fittings:	Safety factor 10.
(2) Cable bending ratio:	Sheave 30 times diameter of cable.
(3) Tread Pressures:	500 lb for cast iron. 1000 lb for steel.
(4) Maximum fleet angle:	1-1/2 degrees.
(5) Steel:	1/5 of yield.
(6) Bearings:	Two times required load at full speed for 2000 hours.

2. Curtains

a. Fabric

(1) Fabric shall be inherently flame resistant or fully flame retardant by the immersion process in accordance with NFPA 701 and the International Building Code NJ Edition.

(a) Provide certification with a permanent label attached to the off-stage bottom hem with information pertaining to fabric type, curtain manufacture date, and dimensions.

(i) Indicate whether curtain is permanently and inherently flame resistant, or whether it will require treatment after dry cleaning.

(ii) Provide notarized affidavits certifying that each fabric has been flame retardant treated or is made of inherently flame resistant fibers as specified.

(iii) Include space on tag for periodic updates of flame retardant application.

(2) Fabric Types

(a) Fabric Type A: 22oz 100% synthetic; colors to be selected from the standard range. Basis of Design: Encore Velour.

(b) Fabric Type B: Black; Basis of Design Janus.

(3) Fabric Schedule

Description	*Quantity*	*Height (Note 1)*	*Width (Note 1)*	*Fullness*	*Fabric*	*Lining*
Main Valance	1	8 ft.	52 ft.	60%	A	B
Main Traveler	2	27 ft.	28 ft.	60%	A	B
Cyc Borders	4	8 ft.	52 ft.	60%	A	-
Cyc Legs	6	27 ft.	28 ft.	60%	A	-
Mid Traveler	2	27 ft.	28 ft.	60%	A	-
Rear Traveler	2	27 ft.	28 ft.	60%	A	-

Note 1: Sizes listed are minimums. Final sizes shall be determined by the Theater Design Consultant based on final sightline analysis.

(4) Fullness: As listed above. Fullness shall be in addition to allowances for seams, turnbacks and side hems.

(5) Pleats: Box type on 12″ centers.

(6) Top finish: 3-1/2″ jute webbing, double-stitched to the top of the curtain with 1″ of face fabric turned under the webbing and as follows:

(a) Flat curtains: #4 brass rustproof grommets inserted in pleat centers or on 12″ centers.

(b) Track-mounted curtains: Plated wire S-hooks or CCF 2 curtain-to-carrier snap hooks.

(c) Batten-mounted curtains: 36″ braided #4 cotton tie lines.

(7) Bottom Finish

(a) Valances and borders: 4″ bottom hems.

(b) Full-height curtains: 6″ bottom hems with separate interior chain pocket with #8 plated jack chain 2″ above finished bottom edge of curtain.

(8) Side Finish

(a) Main traveler: 2″ width of face fabric turned back at leading edge.

(b) All others: 2″.

(9) Lining shall be in the same fullness as the face fabric, finished 2″ shorter than the face fabric, and attached to the face fabric along the bottom hem with 2″ webbing.

3. Dead-Hung Rigging

a. Provide and install dead-hung rigging battens for the Main Valance, Main Traveler, and rear Traveler curtains.

b. All dead-hung battens shall include seven suspension points, each with a #798 beam clamp and appropriate length of ¼″ 7x19 cables, complete with necessary thimbles and copper nicopress ovals.

c. Each suspension point shall include a 3/8" x 6" forged J/J turnbuckle connected to a 1-1/2" pipe batten via heavy-duty full pipe clamps.

d. Hardware: 14-gauge galvanized steel track complete with all necessary accessories for manual traverse silent operation, including an adjustable tensioning floor block.

4. Traveler Tracks

a. Provide a stage curtain tracks to be used in conjunction with stage traveler curtains and upstage acoustic curtains as listed.

(1) Provide a minimum of 48" total overlap of traveler sections at the centerline.

(2) Provide maximum stage width when the curtain is opened.

(3) Provide all tracks with minimum splices.

(4) Attach traveler tracks to the pipe batten with standard #2808 hanging clamps and #22 pipe clamps on 6'-0" minimum centers.

b. Curtain Track and Accessories

(1) Track shall be of 14 gage galvanized construction, entirely enclosed except for the slot in the bottom.

(2) Each section of track less than 30'-0" shall be in one continuous piece. Splice clamps shall be permitted for section lengths over 30 ft.

(3) Carriers shall be constructed of nylon, supported from two heavy-duty polyethylene wheels held in the ball bearing by a nickel plated steel rivet.

(a) Each carrier shall be equipped with a free moving swivel and sufficient trim chain to accommodate a curtain S hook.

(b) Each carrier shall have a backpack.

(c) Rubber washers between each backpack and carrier shall serve as noise eliminators.

(4) The master carrier block shall be constructed of plated steel having two cable clips to clamp the cord to the carrier, and shall be supported by four wheels in pairs identical to the single carrier above.

(5) Live and dead end pulleys shall be adjustable, equipped with oil-impregnated sleeve bearing wheels on adequately guarded plated steel housings.

(6) Provide end stops at each track end and one (1) adjustable, demountable floor pulley.

(7) Stretch-resistant, fiberglass center operating cord shall be 3/8 in. in diameter.

(8) Track shall be rigged for bi parting operation with a 48" center overlap.

(9) Tracks shall include appropriately sized back-pack guides to provide sliding door appearance.

5. Leg Tracks
   a. Provide a total of six curtain track systems to be used with the leg curtains listed.
      (1) All tracks shall be 20'-0" in length, model 280, and equipped with #28 Rotodraper pivot arms.
   b. The leg curtain tracks shall be attached to the pipe battens via standard #2808 hanging clamps and #22 pipe clamps for rigid attachment on 5'-0" minimum centers.
6. Motorized Rigging
   a. Provide and install a complete motorized, self-contained hoist module and control system.
      (1) Basis of Design: Prodigy P1 by Electronic Theater Controls (ETC).
   b. Each batten location shall have a single hoist module attached horizontally to structural steel.
      (1) Each self-contained hoist module shall consist of a single motorized hoisting unit for each batten location, and shall include all electronics, plugs, circuit breakers, motors, sensing devices, lift lines, drums and other equipment required for stage rigging, and the following:
         (a) Integral IEC standard NEMA MGI brakemotor with brake rated at 150% of the motor torque.
         (b) Inverter-duty AC motor and AGMA certified gearbox with a minimum service factor of 1.
         (c) Mechanical load brake
         (d) Helically grooved traveling drum fully enveloping 100% of the wire rope diameter.
         (e) Motor drive, limit switches, cross groove and slack line detection, individual line overload detection and all necessary wiring and accessories.
         (f) Safety latching or twist-locking connectors for power, control and network connections.
         (g) Appropriately sized circuit breaker protection.
         (h) Manufacturer's integrated cable management system.
      (2) Each hoist module shall incorporate a fully mechanical brake located between and directly attached to the reducing gearbox and the wire rope drum.
         (a) The brake shall be engaged at all times and automatically adjust its braking torque based on batten load.
         (b) Braking shall occur instantaneously in the event of motor brake failure, drive system failure, drive shaft failure or power failure.
         (c) Braking shall occur with virtually no impact to the load.
         (d) Any type of overspeed or electrically actuated secondary braking system is not acceptable.

(3) Each hoist module shall incorporate individual line overload detection.

(a) If any single line sees an overload, all movement of that unit will stop.

(b) Indication of overload shall be communicated to the control system.

(c) Software with password protection shall allow a trained technician to operate the unit and correct the problem.

(d) An overload fault in one unit will not affect operation of any other units in the installation.

(4) Each hoist module shall incorporate individual slack line and cross line detection.

(a) In the event that there is a slack line or crossed line on the unit, the detection circuit shall stop all movement of the unit.

(b) Indication will be communicated to the control system.

(c) Software with password protection shall allow a trained technician to operate the unit and correct the problem.

(d) A slack or crossed line fault in one unit will not affect operation of any other units in the installation.

(5) Loft blocks shall be attached to structural steel and shall have cable entry guides to insure that the wire rope will not come out of the sheave.

(a) Loft block sheaves shall be injection-molded from high-strength, glass-filled nylon with two -molded-in, sealed ball bearings.

(b) Hoist and loft blocks shall have quick-attach beam clamps.

(c) Sheaves shall be rated for 100-year life within the tread pressure, temperature and moisture ranges appropriate to the Project's location.

c. Provide ten variable-speed motorized linesets, each with the following components in the quantities and sizes indicated:

(1) Seven loft cables.

(2) One Prodigy V1000S self-contained hoist module as follows:

(a) Variable speed, 0-180 fpm.

(b) 1,200-lb lifting capacity.

(3) Seven 8" underhung loft blocks with incremental idler assemblies.

(4) One 1-1/2" schedule 40 pipe batten, 52'-0" long.

(5) Seven 3/16" 7x19 galvanized aircraft cables of appropriate length.

(6) Seven 3/16" copper oval nicopress sleeves.

(7) Seven 3/16" cable thimbles.

(8) Seven 1-1/2" pipe clamps.

(9) Seven 3/8" x 6" turnbuckles.

d. Provide five fixed-speed motorized line sets for use with on-stage lighting battens, each with the following components in the quantities and sizes indicated:

(1) Seven loft cables.

(2) One P1900G/480 self-contained hoist module as follows:

(a) Fixed speed, 30 fpm.

(b) 1,900-lb. lifting capacity.

(3) Seven 8" underhung loft blocks with incremental idler assemblies.

(4) One 1-1/2" schedule 40 pipe batten, 52'-0" long.

(5) Seven 3/16" 7x19 galvanized aircraft cables of appropriate length.

(6) Seven 3/16" copper oval nicopress sleeves.

(7) Seven 3/16" cable thimbles.

(8) Seven 1-1/2" pipe clamps.

(9) Seven 3/8" x 6" turnbuckles.

e. Provide one electronic rigging controller to enable programming of cues, preset moves, groups of elements and individual moves of hoist units in pre-selected and varied directions and speeds, with the following:

(1) High-resolution, full-color, multi-touch screen.

(2) Proximity and ambient light sensor to control LCD backlight and stage light pollution.

(3) Status, position and load readout on screen.

(4) Locking cover.

(5) Rack mount kit.

(6) Password-protected user-control area with illuminated controls.

(7) Proportional joystick for precise variable-speed control.

(8) "Go" button for movement execution.

(9) No moving parts (no fan or mechanical hard drive).

(10) Two external emergency-stop (e-stop) stations.

(11) Provision for optional remote control.

(12) Automatic logging and diagnostics of entire hoist system.

(13) Motor load-profiling, to stop movement at unexpected load conditions.

(14) Automatic self-tests of all safety circuits.

(15) Motor-usage data statistics and service-interval reminders.

(16) Basis of Design: Foundation Rigging Controller by ETC.

C. Athletic Equipment

1. Basis of Design unless otherwise noted: Products by Performance Sports Systems, Porter Athletic Equipment Company, Jammar, Jaypro or Draper, or as otherwise noted.
2. Gymnasium Divider Curtain
   a. Provide a full-width electrically operated roll-up divider curtain with 8'-0" high fabric lower section and screen upper section.
3. Basketball Backboards
   a. Provide six glass or fiberglass rectangular backboards as indicated, with standard size, markings and goals.
   b. Provide backstops constructed of round tubular steel fully welded construction, electrically raised and lowered, with goal height manually adjustable from 8'-0" to 10'-0".
   c. Provide two cranks for height adjustment.
4. Volleyball System
   a. Basis of Design: Spectrum Complete Recreational Volleyball System by First Team Sports, Inc., adjustable from 42" to 96".
   b. Provide anchoring system consisting of manufacturer's floor sockets and concrete footings as recommended by manufacturer.
   c. Provide manufacturer's fitted post pads and robe covers.
5. Batting Cage
   a. Provide one ceiling-mounted, retractable batting cage with the following:
      (1) 14' high x 14' wide x 70' long.
      (2) Fully motorized operation.
      (3) #42 square nylon netting.
      (4) Two vinyl backdrops.
      (5) Two built-in flap doors.
   b. Basis of Design: Products of On Deck Sports, Brockton MA.
   c. Coordinate location and mounting equipment in reflected ceiling plans and details to avoid conflicts with HVAC and other athletic equipment.
6. Climbing Wall
   a. Basis of Design: Climbing wall and equipment by Rockwerx or Eldorado.
   b. Provide a continuous sculpted rock-like concrete surface 24' wide x 18' high, with steel frame and three climbing routes.
   c. Provide provision for three manual belay stations.
      (1) Belay gear will be provided by Project School District.

7. Wall Pads
    a. Provide standard 2'-0" x 6'-0" flame-retardant wall pads, with PVC cover and 2" urethane cushion.
    b. Provide wall pads to cover walls without bleachers to within 2" of openings.
    c. Provide factory-fabricated cut-outs for wall-mounted fixtures and equipment.

D. Scoreboard and Shot Clocks
1. Basis of Design: Products by Nevco, Fair-Play or Electro-Mech.
2. Provide each scoreboard with multi-sport functions and LED displays appropriately sized for visibility from all points in the space.
3. Gymnasium
    a. Provide one ceiling-hung, four-sided multi-purpose electronic scoreboard with dual integral horns and LED displays for time, scores, period, fouls, and bonus and possession indicators.
        (1) Provide key-operated motorized system for lowering scoreboard to floor for servicing.
    b. Provide two shot clock/game clock combinations with horns, integrated with scoreboard and mounted above competition backboards.
    c. Basis of Design: Nevco Model 2712 4-Face.
4. Auxiliary Gymnasium
    a. Provide one interior, wall-mounted multi-purpose electronic scoreboard with dual integral horns and LED displays for time, scores, period, fouls, and bonus and possession indicators.
    b. Provide two shot clock/game clock combinations with horns, integrated with scoreboard and mounted above competition backboards.
5. Locker Rooms
    a. Provide one wall-mounted locker room clock with horn in each Locker Room and Team Room.
6. Provide one direct-wired, removable controller for each space.
7. Provide one custom team logo on each scoreboard face, factory-applied, in an area of 144 sq. in. minimum.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION E1070.00

SECTION E2010.00

FIXED FURNISHINGS

I. PERFORMANCE

A. Basic Function

1. Provide fixed furnishings as required for fulfillment of the Educational Specifications and functioning of the program spaces, constructed to achieve fire ratings required by code and all other project requirements.
2. Fixed furnishings include the following elements:
   a. Window treatments.
   b. Telescoping bleachers.
   c. Fixed bleachers
3. Where elements also must function as elements defined within another element group, meet 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. Amenity and Comfort

1. Accessibility: Provide fixed furnishings that are easily usable by disabled persons without outside assistance.
2. Light and glare: Provide fixed furnishings that are not a source of direct or reflected glare.
3. Convenience: Provide fixed furnishings with fittings and controls that are manageable without special instruction or the need for excessive force.
4. Appearance: Provide fixed furnishings that are coordinated in design with other elements of interior construction, using compatible materials, colors, and textures.
5. Texture: Provide durable, low maintenance exposed surfaces for fixed furnishings that are within reach of occupants engaged in activities normal for the particular space in which they are installed.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.

D. Structure

1. Provide fixed furnishings that have been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Seismic loads: Provide fixed furnishings that have been engineered and installed to withstand seismic forces that are greater than those required by code.
   a. Application: For design purposes, apply the component seismic force at the center of gravity of the component non-concurrently in any horizontal direction.

E. Operation and Maintenance

1. Ease of Use

a. Language of identifying devices: All text in English.

b. Fixed furnishings with movable components: Easy to use without special instruction and designed to prevent misuse.

c. Hinges and latches: Heavy duty hardware, easily adjustable, providing minimum anticipated service life of 20 years.

d. Mechanical controls: Motors, movable cranks, rotors, pulleys, and levers designed for trouble-free operation over a minimum anticipated service life of 20 years.

2. Ease of repair: Provide fixed furnishings at all locations that are designed to permit repair or replacement of individual components without removal of fixture.

3. Ease of replacement or relocation: Provide fixed furnishings at all locations that are modular in form, detachable from substrate without damage to fixtures, and relocatable.

4. Theft resistance: Provide fixed furnishings at all locations that are attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.

II. PRODUCTS

A. Window Treatments

1. Basis of Design

a. Solar shades: MechoShade ThermoVeil 2100 10% open 2 x 2 open basket weave

b. Blackout shades: MechoShade Equinox Blackout.

2. Provide solar shades at all exterior windows except those in stairs, corridors, vestibules, and similar locations subject to traffic and abuse.

3. Provide blackout shades at all exterior windows where specified in selected spaces .

4. Provide motorized operators with keyed operators for all shades installed in locations higher than 9'-6" above the adjacent finish floor.

B. Telescoping Bleachers

1. Provide motorized telescoping bleachers in compliance with code, project requirements and the following:

a. Operation: Permit opening and closing allowing any or all rows to be locked open for use.

b. Structure: As required by code; minimum 100 psf vertical load, minimum 125 plf vertical load for seat and foot boards, and horizontal forces to keep bleachers correctly positioned when extended and in use.

c. Design

(1) Closed deck and riser design with foot level aisles.

(2) Row spacing: 24".

(3) Row height: Manufacturer's standard.

(4) Fixed safety endrails on open end of end section of stands in accordance with applicable code.

(5) End closures at ends of stands to conceal framing while stored.

(6) Filler board to close opening between top row of seats and wall.

d. Seating: High-density polyethylene, with scuff-resistant, contoured seat surface and integral end caps and rear closure panel.

e. Decking: 5/8" BC grade tongue and groove Douglas Fir plywood; interior type with exterior glue, 5-ply, all plies with plugged cross-bands, produced in accordance with National Bureau of Standards PS-1-97.

(1) Orient plywood with top, center and bottom ply grain-oriented from front of deck to rear of deck (nose beam to riser beam).

(2) Lock adjacent pieces together with tongue and groove joint from front to rear of deck.

(3) Provide clear polyethylene finish.

f. Accessibility: Provide accessible seating areas as required by code and to allow for companion seating.

(1) Provide standard seating that can be manually extended in area of accessible seating.

(2) Provide removable guard rails at accessible seating areas.

g. Operator: Non-friction mechanical pusher type, chain-driven take-up reel, rubber wheels on pusher arms to prevent damage to floor.

(1) Provide hand-held mobile key switch operator for extending or retracting all sections simultaneously, with limit switches to stop drive automatically at fully extended and fully closed positions.

(2) Provide all safety control mechanisms required by code and project requirements.

2. Basis of Design: MAXAM by Hussey Seating.

C. Fixed Bleachers

1. Provide fixed bleachers on cast-in-place concrete risers in natatorium.

2. Provide seating matching telescoping bleachers, with tamperproof stainless steel railings, fittings and anchorage.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION E2010.00

ATTACHMENT 1.4

ELEMENT F
SPECIAL CONSTRUCTION AND DEMOLITION

SECTION F1020.60

MANUFACTURED CANOPIES

I. PERFORMANCE

A. Basic Function

1. Provide exterior canopies as shown, free-standing and/or supported by building elements, constructed to provide cover for building entrances and satisfy requirements of code and all other project requirements.
2. Where elements also must function as elements defined within another element group, meet requirements of both element groups.
3. 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. Accessibility: Provide canopies that comply with requirements for universal and barrier-free access.
2. Light and glare: Provide canopies that are not a source of direct or reflected glare.
3. Appearance: Provide canopies that are coordinated in design with other elements of interior and exterior construction, using compatible materials, colors, and textures.

C. Health and Safety

1. Fire resistance: Provide fire ratings as required by code.
2. Health and safety: Provide safety features as required by code and manufacturer's standards for school use.
3. Locate, fabricate and install all canopies to protect building users and passersby, and to resist damage from vehicles and pedestrians.

D. Structure

1. Provide canopies that have been engineered and installed to withstand dead and live loads and the effects of operation as required by code without excessive deflection or permanent distortion.
2. Wind and seismic loads: Provide canopies that have been engineered and installed to withstand wind and seismic forces that are greater than those required by code.

E. Operation and Maintenance

1. Ease of repair: Provide canopies at all locations that are designed to permit repair or replacement of individual components without removal of entire canopy.
2. Ease of replacement or relocation: Provide canopies at all locations that are modular in form and detachable from substrate without damage.
3. Theft resistance: Provide canopies at all locations that are attached to substrates with concealed, tamper-resistant, or tamperproof fasteners to minimize theft and vandalism.
4. Locate, fabricate and install all canopies to resist damage from vandalism.

II. PRODUCTS

A. Provide freestanding and building-supported engineered metal canopy systems, complete with framing, enclosure, and attachment hardware.

B. Provide canopies with all exposed components constructed of stainless steel, aluminum, or other noncorrosive materials.

C. Materials

1. Aluminum extrusions: ASTM B221 and ASTM B429 6061-T6; 6063-T6 for anodized finish.
2. Aluminum sheet: Minimum 24-ga; heavier as required to resist wind and other loads without deformation or oilcanning.
3. Ground supports: Galvanized steel pipe with concrete foundation; minimum size 6" diameter.
4. Building supports: Minimum 1" diameter steel hangar rod; anchored to building framing.
5. Fascia: Extruded aluminum; minimum thickness .125".
6. Fasteners: Stainless steel or aluminum.
7. Finish: Clear anodic finish, AAMA 611, AAM12C22A41, Class I, 0.018 mm or thicker.

D. Basis of Design: MASA Architectural Canopies, Avenel, NJ.

III. METHODS OF CONSTRUCTION

A. Install engineered embedments at time of building construction to secure canopies to building masonry or framing.

B. Canopy Construction

1. Assemble units in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces
2. Provide expansion joints that allow for thermal movements resulting from locally anticipated change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
3. Take measures to isolate dissimilar metals subject to galvanic action.
4. Decking: Interlocking extruded aluminum decking.
   a. Provide panel width and thickness as required to prevent deformation, oilcanning and ponding.
   b. Provide roll-locked decking where the extruded cap and pan shall interlock to make a rigid structure. Crimped decking is not allowed.
   c. Weld pans at ends to prevent water leakage. Provide T-flashing where decking is separated at a drain beam.

5. Provide cantilevered bents welded into single structures. Use mechanically fastened frame connections only if shipping does not allow for welded frames.
6. Provide full welded beams at both ends to eliminate leaking of water.
7. Do not use face-applied rivets.

C. Provide concealed internal stormwater drainage into underground stormwater system for canopy roofs.

1. Provide positive and negative slope of 1/8" per foot to allow water drainage from top of canopy to draining columns and eliminate ponding.
2. Provide weep holes in all non-draining columns.
3. Construct drainage leaders within structural elements for protection to direct drainage to below-grade structures.

D. Install canopies after other major building elements have been completed. Protect canopies from damage following installation.

END OF SECTION F1020.60

SECTION F1050.10

POOLS

I. PERFORMANCE

A. Basic Function

1. Provide a complete swimming pool and natatorium as shown, complete with finishes, water treatment, HVAC systems and all accessories, to satisfy requirements of code and all other project requirements.
2. Engage a professional swimming pool design consultant with an established record of successful design and execution of swimming pools and natatoria of comparable size and complexity, to design, specify and oversee the construction, installation and testing of all pool components.
3. Design and construct the swimming pool, natatorium, appurtenances and accessories as an integrated system of building structure, enclosure, finishes, and air and water systems.
4. Where elements also must function as elements defined within another element group, meet requirements of both element groups.
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. Accessibility: Provide facilities that comply with requirements for universal and barrier-free access.
2. Appearance: Provide design and finishes that are coordinated in design with other elements of interior and exterior construction, using compatible materials, colors, and textures.

C. Health and Safety

1. Provide a swimming pool and natatorium that comply with all applicable codes and standards, including without limitation the following:
   a. International Swimming Pool & Spa Code 2015.
   b. Model Aquatic Health Code and Annex, 2014.
   c. American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE) Handbooks.
   d. ANSI/APSP/ICC-1 2014 Standard for Public Swimming Pools.
   e. ANSI/APSP/ICC-7 2013 Standard for Suction Entrapment Avoidance in Pools.
   f. ANSI/APSP-11 2009 Standard for Water Quality in Public Pools and Spas.
   g. ANSI/APSP-16 2011 Standard Suction Fittings for or use in Swimming Pools, Wading Pools, Spas and Hot Tubs.
   h. Virginia Graeme Baker Pool & Spa Safety Act.
2. Provide engineered air movement to prevent condensation and buildup of chloramine gas.
3. Fire resistance: Provide fire ratings as required by code.

4. Provide safety features as required by code and industry standards for high school use.
    a. Provide pool construction and accessories consistent with rules and requirements of the National Federation of State High School Associations (NFHS).
5. Provide systems and finishes that are resistant to mold and bacterial growth.

D. Structure
1. Provide a swimming pool and natatorium that have been engineered and installed to withstand the effects of operation as required by code without deleterious impact on pool enclosure or other building elements.

E. Durability
1. Provide institutional grade systems and finishes that are specifically intended for heavy-duty use in public swimming pool installations.
2. Provide systems and finishes that are resistant to corrosion or other deleterious effects from water, humidity, and chemicals used in water treatment and filtration.
3. Insulate all swimming pool and natatorium surfaces, including doors, windows and wall surfaces, from surrounding spaces to prevent condensation.

F. Operation and Maintenance
1. Ease of maintenance and repair: Provide systems and accessories that are designed to facilitate routine maintenance and permit repair or replacement of individual components without undue impact on other components or systems.

II. PRODUCTS

A. Swimming Pool Construction
1. Provide a cast-in-place concrete swimming pool as indicated, with the following:
    a. Cement-based swimming pool plaster finish.
    b. Ceramic tile handgrip coping and 8" vertical tile band.

B. Swimming Pool Accessories
1. Provide four permanently affixed stainless steel ladders with five stainless steel treads.
2. Removable dual-leg starting blocks, all stainless steel with polypropylene non-skid top.
    a. Basis of Design: Paragon Classic Standard Competitor with Competitor anchor assembly.
    b. Confirm mounting height and setback with Project School District.
3. Permanently mounted access lift.
    a. Basis of Design: MultiLift by S.R. Smith.
4. Painted lane lines and numbers consistent with NFHS standards; epoxy paint.
5. Racing lane lines with stainless steel cable, fittings and tensioning system, and polymer wave-quelling floats.

6. Timing system and scoreboard
    a. Basis of Design: Products of Colorado Time Systems as follows:
        (1) Removable 78" x 24" AquaGrip touchpads with textured non-skid surface.
        (2) Championship start system.
        (3) System 6 timing console.
        (4) 8' x12' LED matrix scoreboard with full team information plus six lane times.

C. Swimming Pool Water System
    1. Provide a complete system of pumps, valves, drains, piping, equipment, accessories and controls including without limitation the following:
        a. Heating system to maintain pool water at 78 deg F.
            (1) Provide titanium heat exchanger.
        b. Sand filtration system.
        c. Chlorination system.
        d. Ultraviolet treatment system.
        e. Backwash system.
        f. Surge tank with exhaust system.
    2. Design and install system to prevent cross-contamination with all other building systems.

D. Swimming Pool Space Conditioning System
    1. Provide a complete space conditioning system to provide heating, cooling and dehumidification for the natatorium. Include the following:
        a. Air-to-air heat recovery system to preheat outside air.
        b. Economizer.
        c. Ultraviolet treatment of return air.
        d. Means of purging space in the event of pool shock or chemical emergency.
    2. Design system to maintain space parameters continuously (24/7/365).
    3. Maintain negative pressure in swimming pool room to prevent migration of odors and moisture.
    4. Isolate swimming pool space conditioning system from all other building HVAC systems.
    5. Provide in-floor radiant heat at perimeter window locations.

E. Boiler
    1. Provide one or more dedicated modular boilers to provide hot water for dehumidification reheat system, radiant heat, and heat exchange for pool water heating.
    2. Isolate pool and natatorium hot water system from all other building HVAC systems.

F. Controls

1. Provide an integrated, multifunctional controller system providing control of chemicals, pumps, filters, heaters, boiler(s), air handlers and chloramine reduction systems, and the following:
   a. Programmable pH, ORP and temperature set points.
   b. Programmable proportional feed for precise chemical feed.
   c. Programmable acid, CO2 or base feed for pH control.
   d. Auto backwash filter control.
   e. Flow cell with built-in flow switch, shut-off valves, inlet strainer and sampling port, water level and flow sensors, and Oxidation Reduction Potential (ORP) and pH alarms.
   f. System management software and interface with building management systems.
2. Basis of Design: Acu-Trol AK600 by Pentair.

III. METHODS OF CONSTRUCTION

A. Substantiation

1. In the Preliminary Design Phase, provide a Swimming Pool and Natatorium Basis of Design Report, certified by the swimming pool design consultant, for the Authority's approval and including at a minimum the following information:
   a. Detailed plans and sections of pool and natatorium showing locations of all water and air equipment, air devices, pool features and natatorium finishes.
   b. Swimming pool perimeter, area and volume.
   c. Water recirculation flow rate, turnover and filtration rate.
   d. Anticipated swimmer load (maximum and average).
   e. Source, quality and characteristics of water supply.
   f. Detailed description of filtration and recirculation equipment.
   g. Complete hydraulic computations, including head loss in all piping and recirculation equipment.
   h. Pump sizing and curves showing that the proposed recirculation pump will adequately handle proposed flows.
   i. Quantity and characteristics of the waste water disposal system.
   j. Complete three-dimensional air flow modeling of natatorium, including all furnishings and equipment, to indicate the following:
      (1) Air movement and velocity patterns.
      (2) Air velocity at water surface.
      (3) Capture velocity at exhausts and returns.
      (4) Air movement at glass surfaces and other surfaces subject to fogging and condensation.

B. As-Built Documentation

1. Provide photographic documentation of ALL systems and components, including in-ground systems, before concealment.
   a. Include, without limitation, plumbing, HVAC, electrical and control systems.
   b. Key each photograph to building plan to identify accurate location of each system and component.

END OF SECTION F1020.60

ATTACHMENT 1.5

ELEMENT G
SITEWORK

SECTION G0000.00

SITEWORK

I. PERFORMANCE

A. Basic Function

1. Provide all modifications to the site and site improvements and utilities required for proper functioning of the project and as indicated in the project program.
2. Sitework comprises the following elements:
   a. Site preparation, clearing and earthwork: All modifications to the site and grades required for construction of new work and for proper functioning of the project.
   b. Site improvements: All elements required to provide finished and durable site surfaces, outdoor plantings, and other outdoor improvements described in the project program.
   c. Site utilities: All outdoor and underground elements required to provide utilities, including liquid and gas services, electrical service, and communications.
3. Athletic facilities: Provide playing surfaces, enclosures, goals, fixtures, and other equipment for sports as described in the project program except where noted to be furnished by others.
   a. The Design-Builder's Scope of Work includes construction of the proposed soccer field along Greenwood Avenue as indicated. The existing baseball and football fields along Quinton Avenue are **not** affected by this Project.
4. Where site elements also must function as elements defined within another element group, meet the requirements of both element groups.
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. Existing Conditions

1. The design/builder shall proceed with demolition, mass excavation, rough grading, subsequent foundation installation, utility trenching, etc., based upon the extensive existing conditions information provided, which specifically indicates (or predicts with a high degree of certainty) the presence of sub-surface residual concrete footings, foundations, slabs or potentially other miscellaneous sub-surface debris within the zone of construction. Therefore, in the likely event that residual concrete or other sub-surface debris is encountered during the course of construction operations, that material will be considered part and parcel of the mass excavation spoils, and will be required to be removed by the design/builder at no additional cost. In the event that sub-surface concrete or miscellaneous debris is encountered that is of such excessive size, volume or formidable composition that specialized tools, equipment or techniques are required to demolish and/or remove it, the design/builder will be compensated for all costs associated with the excavation, demolition and/or removal of the excessively substantial or massive sub-surface concrete or debris.
2. Within the limits of construction, and unless otherwise expressly identified to remain or to be terminated, capped and/or removed under this contract, the design/builder shall proceed based upon the assumption that all existing utilities and associated structures and

appurtenances are no longer live, active or to remain. Therefore, all in-situ or residual utility structures encountered are to be considered part and parcel of the mass excavation required to complete the project. In the event that a live (or improperly terminated) utility is encountered or disturbed, the design builder will be compensated for all costs associated with the proper termination, capping and removal of said utility including any associated clean-up costs.

C. Local Requirements

1. Comply with local engineering department standards and local utility requirements.

D. Amenity and Comfort

1. Heat and cold: Design and construct to minimize heat gain in summer and maximize heat gain in winter.
2. Wind: Design and construct to shield entrances from wind in all seasons.
3. Privacy
   a. Provide complete visual screens around the following, preventing visual observation of occupants and equipment from other areas of the site:
      (1) Transformer.
      (2) Generator.
      (3) Mechanical equipment located at or near grade.
4. Cleanliness: Provide above-grade elements, fixtures, and equipment that:
   a. Prevent attraction and adherence of dust and air-borne dirt and soot, and minimize appearance of settled dust and dirt.
   b. Are washed reasonably clean by normal precipitation.
5. Comfort
   a. Provide outdoor seating as described in the project program and Section G2060, Site Development.
6. Appearance
   a. Fit the new activities on site to the topography, soils, and existing vegetation as much as possible.
   b. Finished Surfaces
      (1) Make finished surfaces smooth and uniform in appearance, without depressions that collect water.
      (2) Do not leave soil surfaces exposed in finished work (with the exception of planter beds. Minimize the amount of time that soil surfaces are left exposed.

E. Health and Safety

1. Safety
   a. Design the site to prevent public access except at the main building entrance(s). Physical education and play areas are not open to the public.

b. Control the following:

(1) The passage of people from the public right-of-way onto the site.

(2) Access by unauthorized persons to outdoor areas containing electrical equipment that has exposed powered components.

c. Provide detectable marking tape at all underground utility locations including gas, water, sewer, electrical, telecommunication, and all other subsurface utility structures.

(1) Basis of Design: Pro-Line Safety Products.

(2) Minimum dimensions: 5.0 mil x 4" or as required to maintain detectability at burial depth.

(3) Furnish and install detectable marking tape in accordance with Remedial Action Workplan, APWA standards and local utility requirements.

2. Maximum slopes: Comply with all code requirements and the following:

a. Slopes with smooth pavement: 5% unless restricted to vehicular use or otherwise noted.

3. Physical Security

a. Provide fixed mountings for all items specified in Section G2060.00, Site Development, and other site-related sections.

4. Vehicular safety: Comply with the code.

a. Provide visual barriers at extreme changes in elevation near roadways.

b. Provide tactile detectable warning surfaces where pedestrian walkways cross or run adjacent to roadways.

F. Structure

1. Earthwork: Provide structural design in accordance with ASCE standards if not otherwise required by code.

a. Bearing capacity: Under substructure, paving, and site structural elements, maintain natural bearing capacity or achieve or correct compaction as required to prevent uncontrolled subsidence, differential settlement or other movement.

2. Site Fixtures, Equipment and Services

a. Provide foundations or other mountings as required to support the completed and operational element permanently and safely and without uncontrolled subsidence, differential settlement or other movement.

b. Construct structural elements in accordance with code and all project requirements.

c. Miscellaneous site structures with floors or roofs: Designed and engineered to comply with same requirements as building superstructure, including requirements for building permits and code compliance.

G. Durability

1. Weather resistance of built elements: comply with requirements of Section B.

2. Weather resistance of plants: Provide plants that will withstand extremes of weather likely to occur in any 5 years without supplementary irrigation and without seasonal protection other than mulch.
3. Soil erosion resistance: Comply with the code and the following:
    a. Maintain the existing site features that contribute to erosion resistance to the greatest extent possible.
    b. If the present natural resistance to erosion is insufficient; take measures to improve the resistance to erosion.
    c. Construct to minimize soil erosion.
    d. If erosion occurs during construction and/or within two years after completion, replacement of eroded soil, repair of eroded areas and site cleanup services shall be performed by the Design-Builder at no cost.
    e. If erosion occurs within one year after completion, provide improved erosion control measures within one week after notification.
4. Traffic resistance: Provide finished site surfaces that are permanently resistant to the type of traffic to be expected, under all weather conditions.
5. Stormwater control and detention
    a. Stormwater control and detention measures shown in the Design-Builder Information Package are conceptual only. The Design-Builder must design stormwater management in compliance with all codes and requirements of authorities having jurisdiction, and as indicated in the Conceptual Stormwater Management System drawing.
    b. Control storm water runoff as required to prevent damage to project elements, including vegetation, and to prevent damage to stormwater conduit systems and neighboring sites, including vegetation.
    c. Prevent storm water runoff into public utilities in excess of actual capacity or amount allowed by public agencies, whichever is less, under conditions of the most extreme rainfall that might occur in 25 years, or in accordance with the requirements of authorities having jurisdiction, whichever is more stringent.
    d. Minimize increase in storm water runoff city drainage system as indicated in the Conceptual Stormwater Management System drawing.
6. Vehicular collision: Construct to minimize the probability of vehicular impact on site fixtures and accidental driving on lawns and landscaped areas.

H. Operation and Maintenance
1. Water conservation: Design sitework to conserve water.
2. Ease of Maintenance
    a. Snow removal: Design and construct to facilitate removal of snow from vehicular and pedestrian traffic ways using mechanized equipment or automatic means wherever possible; where not possible, design and construct to minimize the effort required to use manual snow removal methods.

3. Theft Deterrence
    a. Provide fixtures that are either anchored securely to the ground using fastenings not easily removable or that are too heavy for one person to carry, and that are made of materials with no intrinsic or salvage value.
4. Warranty and Maintenance Period
    a. Provide 2-year warranty on all plant material.
    b. Maintain the landscape installation through acceptance and during the 2-year maintenance period following Substantial Completion.

I. Environmental Impacts

1. Perform all sitework in accordance with all codes, regulations, and the requirements and restrictions detailed in the Design-Build Information Package, specifically including all drawings and specifications and the following:
    a. Combined Final Report – Initial and Enhanced Geophysical Surveys, November 2014.
    b. Final Geotechnical Investigation Report for TCHS, October 2015.
    c. Ref: Trenton Central High School Environmental Investigation and Remediation, October 1, 2015.
    d. Utility Investigation Report, Revised October 2, 2015.
2. Develop complete sitework plans and specifications for submission to and approval by the Authority, before the commencement of any sitework.

II. PRODUCTS

(not used)

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G0000.00

SECTION G1000.00

SITE PREPARATION

I. PERFORMANCE

A. Basic Function

1. Provide all modifications to the site required for proper functioning of the project and as indicated in the program.
2. Site preparation is comprised of the following elements:
   a. Site clearing: Removal of trash, existing built elements, and vegetation, including roots and stumps, that are not needed; and temporary erosion control.
   b. Site earthwork: Changing of grade levels, removal of soil and rock, modifying existing soils in preparation for construction, and temporary and permanent erosion and sediment control structures made of soil or rock.
      (1) Note that during demolition of the old Trenton Central High School, masonry was crushed and mixed with soil and used as fill to level the existing site.
3. Where site preparation elements also must function as elements defined within another element group, meet the requirements of both element groups.

B. Durability

1. Soil erosion resistance: As required by code and by authorities having jurisdiction, as specified in Section G0000.00, and as follows:
   a. During construction, take whatever measures are required to minimize the amount of eroded soil that is transported off the site or into waterways under extreme rainfall events as required by code. Include specification of a construction sequence.
   b. In the design of constructed elements, take whatever measures are required to minimize soil erosion under extreme rainfall events as required by code, and to prevent eroded soil from being transported off the site or into waterways.
   c. Obtain a Soil Erosion Permit from the local Soil Conservation District.
   d. Provide erosion control measures designed in accordance with design procedures prescribed by Mercer County and Soil Conservation District permit and the following:
      (1) State of New Jersey Erosion and Sediment Control Manual.
      (2) New Jersey Stormwater Best Management Practices Manual.
   e. Secure a 5G3 Construction Permit.
2. Limit continuous slopes to maximum of 30′ measured vertically, unless intermediate terraces with drainage swales are provided.
3. Replace temporary measures with permanent measures unless made unnecessary by constructed site elements, final topography, or permanent vegetation.

C. Operation and Maintenance

1. Ease of Maintenance

a. Construct earthwork elements so that they are permanent, not requiring periodic maintenance to maintain stability or appearance.

II. PRODUCTS

(not used)

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G1000.00

SECTION G1010.00

SITE CLEARING

I. PERFORMANCE

A. Basic Function

1. Prepare site for execution of earthwork by removing trash, debris, paving, curbs, loose stone and rocks, all vegetative matter (including roots and stumps) not required for final design, and all unwanted built elements, and by protecting soils from erosion.
2. Where site clearing elements also must function as elements defined within another element group, meet the requirements of both element groups.

B. Durability

1. Erosion resistance: As specified in Section G0000.00 Sitework and as follows:
   a. Timing of clearing: To leave soils exposed for as short time as possible; removal of sod last.
   b. Construct and replace sediment barriers and traps wherever run-off will leave the property and wherever significant erosion will occur on the property.
      (1) At the option of the Design-Builder, sediment barriers constructed during the demolition phase may remain in use for the Construction Phase of the Project. Repairs, corrections, maintenance and final removal are the sole responsibility of the Design-Builder.
   c. Construct temporary construction entrance(s) wherever construction equipment will have to enter the site from public roads, to prevent transportation of soil onto roads.
      (1) At the option of the Design-Builder, temporary construction entrances constructed during demolition may remain in use for the Construction Phase of the Project. Repairs, corrections, maintenance and final removal are the sole responsibility of the Design-Builder. Any new temporary construction entrances are the responsibility of the Design-Builder.
2. Construct, maintain, and enforce utilization of vehicle washdown stations at all temporary construction exit locations.

II. PRODUCTS

(not used)

III. METHODS OF CONSTRUCTION

A. Temporary Sediment Barriers and Traps

1. Provide one or more of the following methods as permitted by code and required by site conditions:
   a. Storm drain drop inlet sediment traps.
   b. Retrofit construction at storm water outlet structures.
   c. Temporary sediment basins.
   d. Silt fences, of geotextile fabric on wood posts.

e. Straw or hay bales, anchored to ground.

f. Crushed stone tracking pad.

2. Do not use:

a. Sandbag barriers.

b. Brush, logs, or poles.

END OF SECTION G1010.00

SECTION G1070.00
SITE EARTHWORK

I. PERFORMANCE

A. Basic Function

1. Modify site grades and soils as required for construction of buildings and utilities, for proper functioning of the project, and as indicated in the project program.
2. Provide earthwork consistent with the site's environmental and geotechnical constraints.
3. Principal finished site earthwork elements required include:
   a. Excavation and preparation for school building foundation.
   b. Roadways.
   c. Parking lots.
   d. Playing fields.
   e. Retaining walls.
   f. Landscaping
   g. Planter beds and tree pits.
   h. Permanent soil erosion control structures as required.
4. Earthwork required achieving grades as shown on the Conceptual Grading Plan and foundation recommendations represent one possible approach to earthwork and foundation design. Alternate approaches are acceptable subject to compliance with all codes and project requirements and the approval of the Authority.
5. Where earthwork elements also must function as elements defined within another element group, meet the requirements of both element groups.

B. Structure

1. Retaining walls: Construct retaining walls and other Earthwork elements to permanently resist soil and water pressure as well as live loads, and in accordance with all code requirements.

C. Durability

1. Erosion Resistance
   a. Permanent erosion control structures are required wherever permanent vegetation will not prevent erosion or sediment loss.
   b. Whenever grades are changed, vegetative stabilization is required immediately; to be maintained until final grades are stabilized with permanent vegetation.

D. Operation and Maintenance

1. Ease of Maintenance
   a. Do not use invasive or competitive plants for temporary cover crops.

E. See Section G0000.00, Sitework, for environmental requirements and restrictions.

II. PRODUCTS

A. Retaining Walls

1. Provide one of the following:
   a. Cast-in-place concrete.
   b. Modular concrete block retaining wall system.

III. METHODS OF CONSTRUCTION

A. Changing of Grade Levels

1. Use one or more of the following methods:
   a. Grading.
   b. Balanced cut and fill, with no excess soil to be removed.
   c. Removal of excess soil from site.
   d. Removal of rock from site.
   e. Importation of fill from off site.

B. Excavation

1. Use one or more of the following methods:
   a. Machine excavation.
   b. Hand excavation.

C. Excavation Support and Protection

1. Use one or more of the following methods:
   a. Sheetpiling.
   b. Cribbing and walers.
   c. Reinforced earth.
   d. Soil stabilization.

D. Soil Stabilization

1. Use one or more of the following methods as permitted by code and required by site conditions:
   a. Geotextile reinforcement.
   b. Cement soil stabilization.
   c. Lime soil stabilization.

E. Permanent Erosion Control Structures

1. Provide one of the following:
   a. Retaining walls.
   b. Slope stabilization, using:
      (1) Geogrids.

(2) Slope terracing and swales.

(3) Riprap.

(4) Concrete and asphalt pavement.

c. Soil erosion and sedimentary control certification

F. Environmental Impacts

1. Perform all earthwork in accordance with all codes, regulations, and the requirements and restrictions detailed in the Design-Build Information Package, specifically including all drawings and specifications and the following:

a. Combined Final Report – Initial and Enhanced Geophysical Surveys, November 2014.

b. Final Geotechnical Investigation Report for TCHS, October 2015.

c. Ref: Trenton Central High School Environmental Investigation and Remediation, October 1, 2015.

d. Utility Investigation Report, Revised October 2, 2015.

2. Perform all earthwork in conformance with sitework plans and specifications approved by the Authority.

G. Temporary Vegetative Erosion Control Measures

1. Provide one of the following:

a. Mulching of disturbed areas for stabilization, using:

(1) Straw mulch.

(2) Wood waste, chips or bark, from pre-approved source(s) only.

(3) Erosion control matting or netting, secured according to manufacturer's recommendation.

b. Temporary cover crops on disturbed areas for stabilization. Seed mixture and installation are seasonally dependent and must be pre-approved by the Authority.

H. Dewatering

1. Provide dewatering as required for all earthwork, structural, utility work and landscaping.

2. Do not dewater directly to public storm sewer utilities or to street right-of-way.

3. Provide dewatering devices and methods that comply with all codes and authorities having jurisdiction.

4. Provide dewatering plan to Authority for review and approval.

5. Proper water sampling and permitting/approvals will be required prior to disposal or discharge of any collected water.

END OF SECTION G1070.00

SECTION G1070.20

EXCAVATION AND FILL

I. PERFORMANCE

A. Basic Function

1. Provide all excavation, soil relocation, backfilling, compacting and grading required for the proper functioning of the project, and as indicated in the project program.
2. All deep excavation shall be performed according to code, OSHA and all other applicable regulations.
3. Principal finished elements required include:
   a. Excavation, relocation and regrading of existing subgrade material to reach proposed subgrade elevation underlying the final cover.
   b. Final cover is defined as the topsoil or concrete sidewalks in landscaped areas, the pavement section in paved areas, the bottom of the under-slab ventilation system or first floor concrete slab in building areas, and the bottoms of utility trenches and stormwater detention structures and basins.
   c. Top of subgrade shall mean uppermost surface of an excavated area or a filled area graded to conform to the proposed elevations under the site cover. The top of subgrade material shall be compacted to support the overlying cover material, except at landscaped areas.
4. Note the following:
   a. Masonry from the old Trenton High School was mixed with soil, compacted and used as fill during demolition.
   b. Note: High organic soil was replaced in certain areas in the along Chambers Street during demolition.
5. Dispose of all excessive material, if any, off-site in a code-compliant manner.

B. Safety Structure

1. Use one or more of the following procedure/methods for excavation support and protection:
   a. Sheet piles.
   b. Shielding system and trench boxes.
   c. Soldier piles and lagging.

C. Durability

1. Provide all labor, materials and equipment and systems that have been designed and installed in accordance with high standards of engineering and workmanship that are suitable for the specified services.

II. PRODUCTS

A. Equipment

1. The Design-Builder shall supply all equipment necessary to complete the work specified in this section.
2. Compaction equipment shall consist of vibratory rollers, pneumatic rubber-tired rollers, or other compaction equipment capable of obtaining the required density throughout the different soil types encountered on-site.

B. Fill Materials

1. In areas where the proposed final subgrade top elevation is lower than existing grades excavation and cutting activities will take place. Excavated material will be reused and utilized in backfilling areas where the proposed final subgrade elevation is higher than the existing grades, but only if the material to be utilized in different areas conforms to the specifications for Select Fill Material.
2. All fill material must be approved for its intended use by the Authority Design-Builder's geotechnical engineer prior to use.
3. The Design-Builder shall utilize the following material in the grading and construction of the different systems:
   a. Borrow/in-situ backfill material to be utilized as structural fill in the building areas.
   b. Stockpile amended topsoil layer to be placed in the landscaped areas.
   c. Concrete crusted stone may be recycled as part of a new fill.
4. The Design-Builder shall provide the name and location of the source of any borrow fill material.
5. All borrow fill material shall comply with code requirements and the geotechnical characteristics of the fill to be used, as described in the Project Specifications.
6. Unsuitable Material
   a. Organic matter, stumps, frozen material, clays, rubble, refuse, cinders, rock or other deleterious materials shall not be used as backfill material.
   b. Dispose legally of any excavated or cleared material which is not suitable for use as backfill.
7. Suitable Materials
   a. Suitable material from excavations shall be free from organic matter, vegetation, stumps, frozen material, rubble, refuse, cinders, rock and other deleterious materials.
   b. Material from excavations shall be considered suitable material for reuse only if it complies with the Project Specifications and all applicable codes and requirements of authorities having jurisdiction.
      (1) The Design-Builder is responsible for employment and payment of a certified independent testing laboratory to provide testing and certification of excavated material to confirm suitability for intended reuse.
      (2) The Design-Builder shall obtain approval for any material to be used in construction as suitable borrow or imported fill. On-site reused and off-site

suitable material shall meet the requirements of Select Fill Material described below.

8. Select Fill Material

   a. Structural Fill Under Building Foundations and Concrete Slabs

      (1) Controlled structural fill utilized in the construction areas shall consist of inorganic, readily compactable, predominantly well-graded granular soils with no more than 10% fines (material passing the No. 200 sieve), and a maximum particle size of 3".

      (2) The sandy soil shall be classified as well-graded sandy soil or silty sand (SW or SW-SM) in accordance with the Unified Soil Classification System (USCS) ASTM D 2487, where: $D_{60} > 4\ D_{10}$ and $1 < D_{30}^2 / (D_{10} \times D_{60}) < 3$.

         Note: D_{60} is the size of the soil particles (diameter) in mm corresponding to 60% finer in the particle size distribution curve.

      (3) The moisture content of the fill materials should be controlled to within 2% of the optimum moisture content as determined by the Modified Proctor Test (ASTM D1557).

      (4) Controlled fill within the construction area under the footings and concrete slab should be compacted to at least 98% and 95%, respectively, of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557).

      (5) Backfilling against the footings and grade beams should be compacted to 95% of the maximum dry density (ASTM D1557).

9. Topsoil

   a. Suitable topsoil to be used as a base for grass planting. The topsoil shall be reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and shall be free from stones, stumps, and other objects larger than 2" in any dimension, and other objectionable material.

   b. The topsoil shall meet the Topsoil Standard specified in the State of New Jersey. The standards for Soil Erosion and Sediment Control require the testing of soil pH (and the addition of lime at recommended rates if pH is below 4.0) and other tests recommended by the Rutgers Cooperative Extension, such as total organic carbon content of the soil to assess the suitability of a soil for seeding.

III. METHODS OF CONSTRUCTION

A. General

1. No excavation shall be performed until all site underground structures and utilities have been field located. The Design-Builder shall take all necessary precautions to ensure that no damage occurs to existing structures and utilities.

2. All regulated material shall be excavated, handled, and disposed of under the supervision of the Authority.

3. Clearing shall be performed to the limits of approved disturbance (clearing limits).

B. Surface Preparation

1. Remove heavy growths of grass and other vegetation, roots, logs, debris, stones, objects larger than 12" in any dimension, and other materials that would interfere with construction operations within the clearing limits. Rototill all lawn areas not to remain to a depth of 8" prior to topsoil stripping and stockpiling.
2. Remove and dispose of vegetation, including downed timber, snags, brush, rubbish, stumps, roots, organic and other debris and other vegetation, occurring within areas to be cleared.
3. Remove and dispose of asphalt and concrete, if any, from paved areas to be reconstructed and asphalt millings from paved areas to be regraded or rehabilitated.

C. Excavation and Cutting

1. Excavation and cutting are predominantly performed for regrading the site except for trenching for the removal of existing abandoned utilities and installation of the new utilities, sanitary sewer system and stormwater control system. In addition, areas of severe erosions shall be excavated and backfilled to the appropriate depth and extent.
2. Perform excavation and cutting in a manner that has been approved by the Authority.
3. Control the grading and placement of the excavated material and the sequence of construction in a manner to prevent water from running into excavations. Do not permit water to accumulate in excavations.
4. Provide dewatering systems in accordance with codes and all local requirements.
5. Confine excavation activities in areas where excavation is required. Excessive excavation (overexcavation) shall be backfilled and compacted in accordance with engineering requirements and the approval of Authority.
6. When excavation has reached the required depths, the material and conditions shall be inspected for suitability by the Authority's representative.
7. Use of on-site excavated materials for backfilling and regrading purposes must be approved by the Authority. The Design-Builder shall be responsible for the removal of all excavated material that is not required for the completion of the Work.

D. Stockpiles

1. In no case shall suitable fill material be stockpiled in such manner as to endanger the stability of slopes, existing utilities, structures, vehicles or persons in the construction area. Stockpiled material shall have adequate erosion control measures and shall not be located where the possibility of siltation of any existing catch basin(s) exists. When stockpiled materials interfere with natural drainage, necessary procedures shall be employed to permit surface and subsurface flow.

E. Placement and Installation of Select Fill Material

1. If any foundation/subgrade soils are considered unsuitable and inadequate for the work, a designated Select Fill Material shall be used to replace the unsuitable material.

F. Backfilling

1. Overexcavated areas shall be backfilled as promptly as the excavated material has been removed and in accordance with engineering requirements.

2. Place suitable fill in the designated areas to reach the proposed final subgrade elevations.
3. Place backfill materials in lifts not more than 9" in loose thickness.
4. Do not place backfill material on surfaces that are muddy, frozen, icy or that contain frost.
5. Frozen materials shall not be placed and compacted. Frozen material shall be removed or otherwise treated to make the material acceptable before utilization as fill material.

G. Compaction

1. The Design-Builder shall be responsible for the means, methods, techniques, sequences and procedures of the construction to properly compact the top of subgrade material in cut areas and the backfill material in fill areas to construct a stable subgrade layer capable of supporting the cover layer.
2. Do not perform compaction when the material is too wet either from rain or from excess application of water. Suspend Work at the wet locations until the previously placed and new materials have dried sufficiently to permit proper compaction.
3. Controlled fill within the construction area under the footings and concrete slab shall be compacted to at least 98% and 95%, respectively, of the maximum dry density as determined by the Modified Proctor Test (ASTM D 1557).
4. Backfilling against foundations, footings and grade beams shall be compacted to 95% of the maximum dry density (ASTM D 1557).

H. Grading

1. Areas within the limits of grading, including adjacent transition areas, shall be uniformly graded. The finished surface shall be smooth within acceptable tolerances and with uniform levels or slopes between points where elevations are indicated or between such points and existing grades. No low areas shall remain which would inhibit or impound proper surface drainage.

END OF SECTION G1070.20

SECTION G2010.00

ROADWAYS

I. PERFORMANCE

A. Basic Function

1. Provide roadways 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. Roadways comprise the following elements:
   a. Exterior paved or surfaced areas such as roadways and driveways that are intended for vehicular traffic.
   b. Appurtenances for roadways and driveways, including curbs, gutters, guiderails, pavement markings, speed humps and parking bumpers.
   c. Signs and striping, including traffic signals, bus lanes, stop, yield, and directional and warning signs.
3. Roadways and driveways: Provide paved surfaces as required for vehicular access to the project site and to various functional areas requiring vehicular access, including main entrance, parking areas, freight docks, and loading and unloading zones.
   a. Comply with recommendations of AASHTO *A Policy on Geometric Design of Highways and Streets*, 2004, and MUTCD *Manual of Uniform Traffic Control, NJ Edition*.
   b. Minimum widths: Traffic lanes not less than 12′ wide.
   c. Maximum slopes: 5%.
   d. Minimum slopes
      (1) Minimum long slope: 0% at bus lane loading area; 0.5% elsewhere.
      (2) Minimum cross slope: 1%.
   e. Curbs: Minimum 6″ curbs at all roadways and driveways, unless otherwise noted.
      (1) Provide flush, depressed and mountable curbs where indicated.
   f. Traffic lanes and directional markings: Permanent and highly visible, minimum width of 4″.
4. Where roadways are within or abutting a public right-of-way, comply with standards and requirements of authorities having jurisdiction.
   a. Replace all sidewalks and curbing surrounding the project site as indicated, and in accordance with local requirements and standard details.
   b. In conjunction with replacement of sidewalks and curbing and construction of new driveways, saw cut a minimum width of 7′-0″ of adjacent roadway pavement and repave and restripe to match existing road construction.
   c. Reconstruct all catch basins and replace all curb inlets and related structures adjacent to and abutting new roadway, curb and sidewalk construction, in a manner compliant with all local standards and requirements.

d. Dispose of all removal material in accordance with project requirements and all applicable codes.

5. Where roadways 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 Section G0000.00, Sitework, for environmental requirements and restrictions.

B. Amenity and Comfort

1. Accessibility: Comply with ADAAG.

2. Noise control: Provide paving at roadways and driveways that minimizes noise from automobile tires due to rough surface texture and paving joints.

3. Appearance

a. Vehicular paving: Construct paving to achieve a uniform, seamless and utilitarian appearance.

C. Health and Safety

1. Safety of Vehicular Areas

a. Meet with municipal fire marshal, police department and city officials in order to coordinate any road closure prior to construction activity requiring road closure.

(1) No roadway can be partially or fully closed to construct the school without the approval from municipal authorities having jurisdiction.

(2) Minimize short-term or partial closures for utility connections. If possible, close half the road at a time when trenching for utilities.

(a) Comply with local street closure requirements including those described in the July 2014 Trenton Water Works Engineering Office Developer's Packet.

(b) Road closures must not impede ambulance access to adjacent St. Francis Hospital.

(3) All roads shall be passable at the end of a normal workday. All trenches shall be backfilled, paved or plated.

(4) Pedestrian sidewalks shall not be closed without alternative means for pedestrian movement.

b. Traffic signs and signals: Provide highly visible signs and signals as required to regulate traffic for safety and convenience.

(1) Comply with requirements of the State Department of Transportation for placement and design.

(2) Provide signage to indicate "No Parking during School Hours" on Chambers Street., Greenwood and Hamilton Streets.

D. Durability

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

2. Provide reinforcing fabric consisting of a geotextile specifically designed for asphalt reinforcement, embedded in asphaltic cement between the asphalt base course and wear course layers for all roadway surfaces and recreational and playground areas.
3. Traffic resistance: Provide pavement to accommodate traffic as follows, based on procedures in the AASHTO Guide for Design of Pavement Structures:
   a. Category A: Parking areas and access lanes for autos, pickups, and panel trucks only.
   b. Category A1: Truck access lanes for average daily truck traffic of 1 vehicle with 6 wheels or more.
   c. Category B: Parking entrance areas and major service lanes, with average daily traffic of 25 vehicles with 6 wheels or more.
   d. Category B1: Parking areas and interior traffic lanes for buses or trucks, with average daily traffic of up to 25 vehicles.
   e. Category C: Parking entrances and exterior traffic lanes for buses or light trucks, with average daily traffic of up to 25 vehicles.
   f. Category D: Parking entrances and exterior traffic lanes for heavy trucks, with average daily traffic of up to 25 vehicles.

II. PRODUCTS

A. Vehicular Paving

1. All material utilized in the construction of paved areas shall be in accordance with the New Jersey Department of Transportation (NJDOT) Standard Specifications for Road and Bridge Construction, latest edition.
2. Use the following:
   a. Bituminous asphalt paving reinforced with geotextile fabric embedded is asphaltic cement.
   b. Concrete pavement minimum 4" thick where indicated.
      (1) Provide minimum 3,500 psi concrete with 6x6x6 welded wire mesh.
   c. Heavy-duty concrete paving minimum 6" thick at loading docks and other locations subject to truck traffic and where indicated.
      (1) Provide minimum 4,500 psi concrete with #3 steel reinforcement at 12" o.c.
      (2) Provide ½" x 18" stainless steel dowel pins at 2'-0" o.c. at all expansion joints.

B. Vehicular Curbs

1. Provide concrete and stone curbs in accordance with New Jersey Department of Transportation (NJDOT) Standard Details and Standard Specifications for Road and Bridge Construction, Section 607.
2. Use any of the following:
   a. Street, depressed, mountable and/or flush concrete curbs.
   b. Stone curbs, where noted.

C. Asphalt Paving (Geotextile) Fabric

1. Not required.

D. Guiderail

1. Use only galvanized steel fully-interchangeable guiderail, guiderail parts, terminal sections and fasteners that meet NJDOT/AASHTO M 180 requirements and are composed of Class A, Type II beams, and ASTM B209/B209M from manufacturers approved by the NJDOT.
2. Use steel posts that meet the requirements of ASTM A709 (A709M), Grade 36 (250) or ASTM A769 (A769M) Class I, Grade 40 (380).
3. Steel components (except cables, if any) are to be galvanized according to ASTM A123A/123M.
4. Steel posts and offset blocks are to be galvanized according to ASTM A123A/123M.
5. Steel fasteners, bolts, washers, etc., are to be galvanized according to ASTM A153A/153M.

E. Pavement Markings

1. Use thermoplastic paint and local standards for all striping, chevrons and other markings within the public right-of-way.
   a. Basis of Design: Sherwin-Williams Smart Mark Alkyd Thermoplastic Pavement Marking.
      (1) Comply with AASHTO M249.
      (2) Extrude at 120-mil thickness and heat fuse.
      (3) Provide glass traffic beads complying with AASHTO M247 Type 1.
      (4) Color: White, unless otherwise indicated.
2. Basis of Design for on-site striping: Zoneline Traffic and Zone Marking Paint as manufactured by PPG Architectural Finishes, Inc., Pittsburgh, PA.
   a. Apply two coats of Traffic and Zone Marking Paint to the asphalt surface as shown on the Site Plan. Apply undiluted, following the manufacturer's recommendations.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G2010.00

SECTION G2020.00

PARKING LOTS

I. PERFORMANCE

A. Basic Function

1. Provide parking lots and loading/service courts as required by the project program and by code 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. Parking lots comprise the following elements:
   a. Exterior paved or surfaced areas for parking lots and loading/service areas.
   b. Appurtenances for parking lots, including curbs, gutters, guiderails, pavement markings, speed humps and parking bumpers.
   c. Signs, including traffic signals and signs, directional signs, warning signs and parking space marking and identification.
3. Parking lots: Provide standard and heavy-duty paved surfaces as required for vehicular access to the project site and to various functional areas requiring vehicular access, parking stalls (standard and designated as barrier-free or handicap), freight docks, and loading and unloading zones.
   a. Comply with recommendations of AASHTO *A Policy on Geometric Design of Highways and Streets* and MUTCD *Manual of Uniform Traffic Control, NJ Edition.*
   b. Minimum widths: Traffic lanes not less than 12′ wide.
   c. Maximum slopes: 5% and as required by the New Jersey Barrier-Free Subcode for accessible routes.
   d. Minimum Slopes
      (1) Minimum long slope: 0.5%.
      (2) Minimum cross slope: 1%.
   e. Curbs: Standard concrete street curb with 6″ reveal, 4″ reveal, sloping reveal, flush concrete curb, depressed concrete curb and mountable concrete street curb as designated on the site plans.
   f. Traffic lanes and directional markings: Permanent and highly visible, minimum width of 4″.
4. Parking areas: Provide paved surfaces as required for vehicular parking.
   a. Minimum width of parking spaces: 108″ for standard spaces; as required by the New Jersey Barrier-Free Subcode for accessible spaces.
   b. Bumpers: Locate and size to prevent damage to fixed objects, or excessive encroachment on pedestrian walkways.
   c. Wheel stops: Not required. Wheel stops are to be avoided because of an inherent trip hazard, and the difficulty they create with respect to snow removal operations.
   d. Space markings: Permanent and highly visible, minimum width of 4″.

e. Parking signage: As required by code and project program. Install in concrete-filled utility bollards at barrier-free parking spaces.

5. Where parking lots 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 Section G0000.00, Sitework, for environmental requirements and restrictions.

B. Amenity and Comfort

1. Accessibility
   a. Comply with applicable codes requiring barrier-free access, including number, locations and dimensions of parking stalls.
2. Noise control: Provide paving at parking lots that minimizes noise from automobile tires due to rough surface texture and paving joints.
3. Appearance
   a. Vehicular paving: Construct paving to achieve plain, utilitarian appearance.

C. Health and Safety

1. Safety of Vehicular Areas
   a. Traffic signs and signals: Provide highly visible signs and signals as required to regulate traffic for safety and convenience.
      (1) Comply with requirements of the State Department of Transportation for placement and design.

D. Durability

1. Service life span of paved surfaces: 25 years, under normally anticipatable usage.
2. Provide reinforcing fabric consisting of a geotextile specifically designed for asphalt reinforcement, embedded in asphaltic cement between the asphalt base course and wear course layers, for all asphalt parking lot surfaces.
3. Traffic resistance: Provide pavement to accommodate traffic as follows, based on procedures in AASHTO GDPS, Guide for Design of Pavement Structures, latest version and supplements:
   a. Category A: Parking areas and access lanes for autos, pickups, and panel trucks only.
   b. Category A1: Truck access lanes for average daily truck traffic of 1 vehicle with 6 wheels or more.
   c. Category B: Parking entrance areas and major service lanes, with average daily traffic of 25 vehicles with 6 wheels or more.
   d. Category B1: Parking areas and interior traffic lanes for buses or trucks, with average daily traffic of up to 25 vehicles.
   e. Category C: Parking entrances and exterior traffic lanes for buses or light trucks, with average daily traffic of up to 25 vehicles.

f. Category D: Parking entrances and exterior traffic lanes for heavy trucks, with average daily traffic of up to 25 vehicles.

II. PRODUCTS

A. Parking Lot Paving

1. All material utilized in the construction of paved areas shall be in accordance with the New Jersey Department of Transportation (NJDOT) *Standard Specifications for Road and Bridge Construction*, latest addition.
2. Use the following:
   a. Bituminous asphalt paving reinforced with geotextile fabric embedded in asphaltic cement (playground only).
   b. Concrete pavement minimum 4" thick in traffic islands and where indicated.
      (1) Provide minimum 3,500 psi concrete with 6x6x6 welded wire mesh.
   c. Heavy-duty concrete paving minimum 6" thick at loading docks and other locations subject to truck traffic and where indicated.
      (1) Provide minimum 4,500 psi concrete with #3 steel reinforcement at 12" o.c.
      (2) Provide ½" x 18" stainless steel dowel pins at 2'-0" o.c. at all expansion joints.

B. Parking Lot Curbs

1. Provide concrete and stone curbs in accordance with New Jersey Department of Transportation (NJDOT) *Standard Details and Standard Specifications for Road and Bridge Construction*, Section 607.
2. Use any of the following:
   a. Concrete street, flush, depressed and mountable curbs.
   b. Stone curbs where noted.

C. Asphalt Paving (Geotextile) Fabric

1. Basis of Design: Petromat® Style 4599 by Propex Operating company, LLC, Chattanooga, TN.

D. Guiderail

1. Use only galvanized steel fully-interchangeable guiderail, guiderail parts, terminal sections and fasteners that meet NJDOT/AASHTO M 180 requirements and are composed of Class A, Type II beams, and ASTM B209/B209M from manufacturers approved by the NJDOT.
2. Use steel posts that meet the requirements of ASTM A709 (A709M), Grade 36 (250) or ASTM A769 (A769M) Class I, Grade 40 (380).
3. Steel components (except cables, if any) are to be galvanized according to ASTM A123A/123M.
4. Steel posts and offset blocks are to be galvanized according to ASTM A123A/123M.
5. Steel fasteners, bolts, washers, etc., are to be galvanized according to ASTM A153A/153M.

E. Pavement Markings

1. Use thermoplastic paint and local standards for crosswalk markings and all striping within public right-of-way.
   a. Basis of Design: Sherwin-Williams Smart Mark Alkyd Thermoplastic Pavement Marking.
      (1) Comply with AASHTO M249.
      (2) Extrude at 120-mil thickness and heat fuse.
      (3) Provide glass traffic beads complying with AASHTO M247 Type 1.
      (4) Color: White, unless otherwise indicated.
2. On-Site Striping
   a. Basis of Design for on-site striping not otherwise indicated: Zoneline Traffic and Zone Marking Paint as manufactured by PPG Architectural Finishes, Inc., Pittsburgh, PA.
   b. Apply two coats of undiluted Traffic and Zone Marking Paint in accordance with manufacturer's recommendations.
3. Pavement marking colors: Three standard colors of traffic and zone paint shall be used: WHITE, YELLOW and Handicap BLUE.
   a. Use WHITE to define the parking stalls and speed hump chevrons.
   b. Use YELLOW to define traffic islands and loading/service and "no parking" areas (including the chevrons and lettering).
   c. Use WHITE for direction-of-travel arrows
   d. Use BLUE for the aisle aligned with the pedestrian ramp between handicap parking stalls.
   e. Use BLUE for barrier-free parking stall designation.
   f. Use YELLOW for dashed lane and/or centerline markings.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G2020.00

SECTION G2030.00

PEDESTRIAN PLAZAS AND WALKWAYS

I. 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 sports and 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. Heavy-duty concrete pavement, uncolored.
   c. Integrally colored (tinted) concrete pavement.
   d. Concrete curbs.
   e. Mountable and flush concrete curbs.
   f. Depressed curbs and ramps for vehicles and pedestrians.
   g. Exterior handrails and guardrails in pedestrian plazas and walkways.
   h. Pavement markings.
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: As required by code and sized to allow comfortable two-way traffic.
      (1) Main entrance: 144″.
      (2) Secondary entrances and emergency exits: 60″.
      (3) Major routes: 60″.
      (4) Secondary routes: 48″.
   b. Handrails, railings or protective walls: As required by code and when pedestrian surfaces are more than 16″ 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 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" in height.
   b. Landings: Provide exterior stairs with maximum rise of not more than 8' 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 with a minimum static coefficient of friction of 0.80, measured in accordance with ASTM D2047.
   b. Stairs
      (1) Risers: Closed.
      (2) Treads: Maximum bevel or radius on leading edge of 1/2", slope to drain.
   c. Guards, Guardrails or Protective Walls
      (1) Openings: No openings large enough for a sphere with a diameter of 4" 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" or as required by code.

(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.

II. PRODUCTS

A. Uncolored Concrete Pavement

1. Provide uncolored concrete pavement minimum 4" thick where indicated, with consistent broom finish.

2. Provide minimum 3,500 psi concrete with 6x6x6 welded wire mesh.

B. Heavy-Duty Concrete Pavement

1. Provide heavy-duty concrete paving minimum 6" thick at loading docks and other locations subject to truck traffic and where indicated, with consistent broom finish.

2. Provide minimum 4,500 psi concrete with #3 steel reinforcement at 12" o.c.

3. Provide ½" x 18" stainless steel dowel pins at 2'-0" o.c. at all expansion joints

C. 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. Basis of Design: Mix-Ready Standard Dry Pigment Color by Davis Colors.

c. Conform to 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.

d. Do not use supplemental admixtures unless approved by the manufacturer of the colorant. Do not add calcium chloride to the concrete mix as mottling and surface discoloration will occur.

e. Do not over trowel or burnish the surface, and provide a consistent broom finish. Exercise extreme care to prevent any concrete, especially tinted concrete, from contacting the exposed faces of adjacent materials and finishes during placement and finishing.

D. Concrete Curbs

1. Provide concrete and stone curbs in accordance with New Jersey Department of Transportation (NJDOT) Standard Details and Standard Specifications for Road and Bridge Construction, Section 607.

2. Use any of the following:

a. Mountable and/or flush concrete curbs.

b. Stone curbs where noted.

E. Exterior Handrails and Guardrails

1. Provide ASTM A312/A312M, Grade TP 304, Standard Weight (Schedule 40) 1-1/2" stainless steel pipe, unless another grade and weight are required by structural loads.

2. Weld and grind all joints smooth.

3. Provide stainless steel 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 brushed stainless steel finish.

F. Pavement Markings

1. Use thermoplastic paint and local standards for crosswalk markings, stop bars and all striping within public right-of-way.

a. Basis of Design: Sherwin-Williams Smart Mark Alkyd Thermoplastic Pavement Marking.

(1) Comply with AASHTO M249.

(2) Extrude at 120-mil thickness and heat fuse.

(3) Provide glass traffic beads complying with AASHTO M247 Type 1.

(4) Color: White, unless otherwise indicated.

2. On-Site Striping

a. Basis of Design for on-site striping not otherwise indicated: Zoneline Traffic and Zone Marking Paint as manufactured by PPG Architectural Finishes, Inc., Pittsburgh, PA.

b. Apply two coats of undiluted Traffic and Zone Marking Paint in accordance with manufacturer's recommendations.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G2030.00

SECTION G2050.00

ATHLETIC, RECREATIONAL AND PLAYFIELD AREAS

I. 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. Grass turf (sod) at soccer field.
   b. Exterior colored acrylic sports surface on asphalt.
   c. Resilient poured-in-place rubberized playground surface.
   d. Miscellaneous painted ground games and graphics.
3. Acrylic Sports Surface at the Early Childhood Outdoor Play Space: Provide smooth, seamless surfacing for trike path and all other exposed asphalt surfaces.
4. Resilient Poured-in-Place Surface at the Early Childhood Outdoor Play Space: Provide smooth and resilient surfacing complying with CPSC Pub. No. 325 under and around all playground equipment.
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. Accessibility
   a. Comply with all codes with respect to requirements for barrier-free access.
2. Appearance
   a. Exterior playground and sports surfaces: Provide surfaces that are smooth and colorful, and that contrast with adjacent surfaces and walls.

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. Resilience: Provide exterior sports surfacing with inherent flexibility and resilience appropriate for the intended uses and as follows:
   a. At Early Childhood Outdoor Playground Equipment: Critical height of not less than 3 ft., when measured in accordance with ASTM F 1292-2004 in the Use Zones defined by ASTM F 1487-2005.
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.

B. Durability

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

2. Provide reinforcing fabric consisting of a geotextile specifically designed for asphalt reinforcement, embedded in asphaltic cement between the asphalt base course and wear course layers for all roadway surfaces and recreational and playground areas.

II. PRODUCTS

A. Exterior Colored Acrylic Sports Surface on Asphalt

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° F.

c. Apply surface system in strict accordance with the manufacturer's instructions and requirements.

d. Apply Stripe-Rite primer prior to all striping.

e. First coat: Acrylic Resurfacer with Sand (CMT-33); color BLACK.

(1) Apply first coat to any exposed (black) asphalt within the playground area.

f. Second coat: Neutral Concentrate with Sand (CMT-40) mixed with ColorPlus Concentrate (CMT-39).

g. Third coat: Neutral Concentrate with Sand (CMT-40) mixed with ColorPlus Concentrate (CMT-39).

h. 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.

i. The second and third coats shall be the following colors at the following locations:

(1) Trike path: RED with 2" wide WHITE stripes.

(2) All areas not otherwise specified: LIGHT GREEN.

j. 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. Resilient Poured-in-Place Rubberized Playground Surface

2. Basis of Design: PlayBound Poured-in-Place system as manufactured by Surface America, Williamsville, NY.

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.

d. Color of the EPDM top surface shall be a 50/50 blend of two (2) standard colors as follows: SKY BLUE AND TEAL.

e. Install a minimum ¾" thick 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.

B. 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.

a. Apply two coats of Zoneline Traffic and Zone Marking Paint to the asphalt surface that has already received at least one coat of BLACK Acrylic Resurfacer with Sand, and one coat of Stripe-Rite primer.

C. Do not use the following within the playground area:

1. Rubber interlocking tile system.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G2050.00

SECTION G2060.00

SITE DEVELOPMENT

I. 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) Vinyl-coated chain link fence.
      (3) Gates and gate operators.
   b. Site Furnishings
      (1) Play equipment.
      (2) Round tables with integrated seats and removable umbrella.
   c. Flagpoles and American Flag
   d. Site Specialties
      (1) Decorative security bollards.
      (2) Utility pipe bollards.
      (3) Artificial grass.
      (4) Rubber flex curb.
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.

D. Durability

1. Service Life

a. Minor site structures: Same as for equivalent building elements.

b. Other fixed site improvements: Fifteen years under normal use and weather.

c. Athletic nets: Five years under continuous weather exposure.

2. Provide tamper-proof anchorage to concrete foundation for all fixtures, equipment and structures unless otherwise noted.

II. PRODUCTS

A. Fences and Gates

1. Provide the following:

a. Ornamental Steel Picket Fence

(1) Basis of Design: Montage II, (ATF) Welded Steel Ornamental Fence, manufactured by Ameristar Fence Products, Tulsa OK.

(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 picket spacing.

(6) Panel height: Perimeter fence 8' ht. and/or as indicated elsewhere.

(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.

(a) Provide two rails at 4'-0" fencing and three rails at other locations.

(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. in all

(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: Match color of existing ornamental fence.

(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: Set posts in 10" dia. x 3'-6" deep concrete footings. Concrete shall be a minimum of 3,500 PSI. Recess footing tops a minimum of 6" below adjacent concrete sidewalks or adjacent asphalt surfaces; pitch footing tops slightly to direct water away from the base of the posts.

(15) Install fence panels level and stepped as required to follow grade.

(16) Install all fences, in non-paved locations, centered on a one (1) ft. wide continuous concrete pavement mowing strip. The tops of the concrete fence post footings shall be recessed 4" below finished grade, so that the concrete mowing strip is continuous and uninterrupted, including through gates openings. The concrete mowing strip shall extend a minimum of 6" beyond all end/corner posts, and shall be finished with the same attention to detail as concrete sidewalk pavement, and sloped to prevent standing water at the base of the posts.

b. Chain Link Fence

(1) Design chain-link fences and gates, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

(2) Structural performance: Provide chain-link fence and gate framework to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:

(a) Minimum post size: Determine according to ASTM F 1043 for framework up to 12' (3.66 m) high, and post spacing not to exceed 10' (3 m).

(b) Minimum post size and maximum spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:

(i) Wind loads: Basic wind speed = 90 MPH

(ii) Exposure category: B.

(iii) Fence height: As indicated.

(iv) Material group: IA, ASTM F 1043, Schedule 40 steel pipe

(3) Fabric: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

(a) Fabric height: As indicated on drawings.

(b) Steel wire fabric: Wire with a diameter of 0.192" (4.88 mm).

(c) Mesh size: 2" (50 mm).

(d) Polymer-coated fabric: ASTM F 668, Class 1 over zinc-coated steel wire.

(e) Color: As selected by Architect from manufacturer's full range, complying with ASTM F 934.

(f) Selvage: Knuckled at both selvages.

(4) Provide top and bottom rails, tension wires, gates, tamper-proof hardware and fittings, and all accessories in compliance with manufacturer's instructions and code requirements.

(5) Coatings: Provide manufacturer's polymer finish over Type III, Zn-5-Al-MM alloy coating.

(6) Gates: Provide matching gates with diagonal cable bracing. Provide drop bar locks into sleeves set in concrete for pairs of gates.

(17) Install all fences, in non-paved locations, centered on a 1'-0" wide continuous concrete pavement mowing strip. The tops of the concrete fence post footings shall be recessed 4" below finished grade, so that the concrete mowing strip is continuous and uninterrupted, including through gates openings. The concrete mowing strip shall extend a minimum of 6" beyond all end/corner posts, and shall be finished with the same attention to detail as concrete sidewalk pavement, and sloped to prevent standing water at the base of the posts.

c. Gates: Matching all welded construction, with panels and finish to match adjacent fencing except with flush bottoms. Provide picket track top. Gates 6' and wider shall 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 gate leaves 6' or wider.

(1) Swing gates: Single or double as indicated. Matching all welded construction and finish; fabricated in accordance with ASTM F900 using fully welded galvanized 2" x 2" square steel tube. Gate hardware shall conform to ASTM F900. Gates, hinges, latches, drop rods, mounting plates, shields, and all other components shall be hot-dipped galvanized steel or non-corrosive materials and sized to assure proper operation. Provide matching polyester factory finish for all non-moving parts.

(2) Swing Gate Hardware

(a) Personnel gates: Minimum two non-removable hinges per leaf.

(b) Exit gates: Where required, provide 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.

(i) Provide 2" x 10" x 3/16" steel tube mounting plates integral with and welded to pickets and frame for exit device and latch.

(ii) Provide perforated steel sheet shield over gate and adjacent panels minimum 3'-0" from gate. Basis of Design: McNichols #1698001141, with hemmed edging.

(iii) Integrate exit devices with Security Gate systems and hardware where provided.

(c) Provide pinch-proof self-closing hydraulic gate closers, hinges and stops at all personnel gates.

(i) Basis of Design: SureClose systems by D&D Technologies, Huntington Beach, CA.

(d) Padlocks for manual gates not equipped with exit devices shall be provided by the Project School District.

(3) Vehicular Pivot Gates

(a) Basis of Design: TYM-VP Pivot Gate and Operator System, by Tymetal Corporation, with panels to match the ornamental steel picket fence.

(4) Vehicular Cantilevered Sliding Gate

(a) Basis of Design: Structural cantilever slide gate by Tymetal Corporation, manual operation, with matching ornamental steel picket fence panels and finish.

(5) Security Gate Hardware

(a) Where indicated or directed, provide gates with electric locks, position sensors, operators, closers and camera coverage fully integrated with building lock and security systems and controlled from security desk location(s).

(b) Comply with UL 325 and ASTM F2200 in design, manufacture and installation of gates and gate operators.

(6) Provide utility pipe bollards for protection of all gate operators, and all loading dock corners, stairs, ramps etc.

d. All listed information such as type, size, spacing, footing size, etc. represent minimum standards. Furnish and install all fences and gates in full compliance with manufacturers' requirements.

e. Provide means of emergency operation of all proposed vehicular gates in a manner acceptable to local emergency responders.

f. Furnish three additional replacement panels of each type, size and finish of ornamental steel picket fencing.

B. Site Furnishings

1. Play Equipment

a. Basis of Design - Play Structure: Smart Play®: Motion play structure, manufactured by Landscape Structures, Inc., Delano, MN.

(1) The age range of the play structure is 2-5 yrs., with a maximum fall height of 32".

(2) The color pallet of the play structure shall be selected by the Authority from the manufacturer's standard offerings.

b. Basis of Design - Play Elements, Wall-Mounted: Model MSC680197 (Car) as manufactured by Kompan Playgrounds, Tacoma, WA.

(1) Quantity required: One (1) to be wall-mounted, in accordance with the manufacturer's instructions, in the vicinity of the Store Front with Service Station play elements and adjacent to the trike path.

c. Basis of Design - Play Elements, Wall-Mounted: Model MSC690665 (Store Front with Service Station and Appurtenances) as manufactured by Kompan Playgrounds, Tacoma, WA.

(1) Quantity required: One (1) set, to be wall-mounted, in accordance with the manufacturer's instructions, in the vicinity of the Storage Room Door and adjacent to the trike path.

2. Round Tables with Integrated Seats and Removable Umbrella

a. Basis of Design for Tables: Pilot Rock T104K/G-4** Series Portable Round Table for Kids with hot-dipped galvanized frame (after fabrication), thermo-plastic (UV stabilized polyurethane) coated R-Type perforated steel top and curved seats, with integrated umbrella cup, as manufactured by RJ Thomas Mfg. Co., Inc., Cherokee, IA.

(1) The table top is 4' nominal diameter, and the curved seats are 40" long. Nominal table height is 20", and nominal seat height is 12".

(2) Quantity required: Supply and assemble three (3) tables total, consisting of Grey tables (color code RA). Supply one (1) table with all Blue seats (color code RU), one (1) table with all Red seats (color code RR) and one (1) table with all Green seats (color code RN).

(3) Galvanizing of frame and frame component to conform to ASTM-A123.

b. Basis of Design for Umbrella: Pilot Rock Model UM-4 Premium Acrylic Fabric Umbrella, as manufactured by RJ Thomas Mfg. Co., Inc., Cherokee, IA.

(1) 7'-6" diameter umbrella supported by a 1-1/2" OD anodized aluminum pole and eight (8) chrome plated steel ribs.

(2) Lift mechanism to be crank operated with steel cables and EZ-latch spring mechanism.

(3) Fabric to consist of 9 oz. solution dyed marine grade with UV inhibitors.

(4) Quantity required: Supply three (3) umbrellas. Supply one (1) umbrella with Pacific Blue and White alternating colors, One (1) umbrella with Logo Red and White alternating colors and one (1) umbrella with Forest Green and White alternating colors.

c. Because the tables are sized for small children, approximately 6-8 inches must be removed from the bottom of the umbrella poles to proportionally fit the smaller table and to remain stable. The cut edge of the pole shall be straight, square and free of sharp edges and burrs.

C. Flagpole and American Flag

1. Basis of Design: Ground-mounted tapered aluminum flagpoles manufactured by Eagle Mountain Flag and Flagpole, Wimberley, TX.

   a. Night Master Series internal halyard aluminum flagpoles.

   b. Quantity required: A total of three (3), consisting of one (1) 40′ height, 7″ diameter, 0.188″ wall thickness, and two (2) 35′ height, 6″ base diameter, 0.156″ wall thickness poles.

   c. The 40′ flagpole is to occupy a centralized location in front of and on axis with the main entrance, symmetrically flanked by the two 35′ tall flagpoles.

   d. Features and Accessories

      (1) Pole: Seamless 6063 aluminum tubing with uniform conical taper; satin brushed aluminum finish. The 35′ tall flagpoles are to be a one piece shaft design, and the 40′ tall flagpole shall be a two-piece shaft design.

      (2) Mount: Cast aluminum shoebase mount.

      (3) Footing: Cast-in-place 4,500 psi concrete base; minimum 4′-0″ deep x 3′-0″ diameter.

      (4) Light/truck combo: Cast aluminum double 20-watt LED flagpole light/truck combination with aircraft grade aluminum lens rings and stainless steel ball-bearing truck system.

      (5) Finial: Gold anodized ball; 6″ diameter.

      (6) Halyard: Complete internal halyard system, with rope, cam cleat, snap hooks, rubber-covered counterweight, retainer ring, and locking cast aluminum access door.

   e. Flagpole lighting control: Control with central digital lighting control system.

   f. American flag: Size 6′ x 10′. Highest quality, sewn polyester, with fully embroidered stars, canvas heading and brass grommets. Basis of Design: Valley Forge or Super Tough Brand.

      (1) Quantity one (1) required.

D. Site Specialties

1. Decorative Security Bollards

   a. Basis of Design: Striped Tornado Bollard, Model # 5704-STB, as manufactured by Iron Age Designs, Burien, WA. Color: TBD

   b. Provide 12″ dia. x 42″ deep concrete footing for embedment at each bollard location. Install the decorative security bollards following the manufacturer's recommendations. Recess the tops of the concrete footings a minimum of 4″ below adjacent concrete sidewalk surfaces.

   c. Install 39″ exposed height decorative security bollards plumb, and so as to ensure that there are no gaps between the base plate or bottom lip and the adjacent sidewalk surface.

2. Utility Pipe Bollards
   a. Provide custom-fabricated utility pipe bollards consisting of lengths of 8" dia. schedule 40 steel pipe. Provide at service court/loading dock, vehicular gate operators and sign post support as required and as indicated..
      (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.
         (a) Primer Basis of Design: Krylon K00024000 galvanized metal primer.
      (2) Apply two coats of oil-based exterior gloss enamel after installation and concrete filling.
      (3) Top coat color: Federal (safety) yellow.
3. Artificial Grass
   a. Provide and install hybrid artificial grass where indicated and as follows:
      (1) 1-1/2" grass zone of lime green polyethylene.
      (2) 1-1/4" nominal thatch zone of tan polypropylene.
      (3) Pile weight: 80 oz.
      (4) Total weight: 104 oz.
      (5) Warranty: 15 years.
   b. Basis of Design: SYNTipede 354 by SYNLawn, Dalton GA.
4. Rubber Flex Curb
   a. Basis of Design: 6" x 6" x 8' solid rubber flex curb as manufactured by Playcore Co., Inc., Tempe AZ.
      (1) Color: Red.
      (2) Join rubber curb sections, and install using only polyurethane adhesive approved by the manufacturer. Adhere the rubber curb to the surface of the asphalt pavement as indicated. Adhesive should be applied in a manner that will not block drainage channels. Do not use the steel rebar/pin anchoring system.
      (3) Exposed ends of rubber curb should be cut at an angle to present a neat appearance, and reduce tripping hazard condition.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G2060.00

SECTION G2080.00

LANDSCAPING

PERFORMANCE

A. Basic Function

1. Provide landscaping over all areas of the site not finished with proposed paving, surfacing, buildings or other existing facilities or utilities to remain.
2. The Design-Builder shall prepare the landscape design and receive approval from the Authority prior to proceeding. The Design-Builder shall prepare the planting pits, beds, raised planters, etc., and shall supply and install the planting medium and plant material including appurtenances. The Design-Builder shall maintain the landscape installation through acceptance and during the subsequent maintenance period of two calendar years.
3. All plant material supplied 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 approved Plant Schedule shall refer to the main body of the plant, not from branch tip to tip. Caliper of trees shall be taken 12″ above ground level.
   b. Minimum size and root requirements:
      (1) Shade tree plantings; minimum size = 3-1/2″ - 4″ cal., B&B.
      (2) Ornamental and coniferous tree plantings; minimum ornamental tree height = 10′ -12′ B&B, and minimum conifer height = 6′ - 7′ B&B.
      (3) Shrub plantings; minimum size = 18″- 24″ height or spread, B&B or container.
      (4) Perennial and groundcover plantings; 1 gal. container preferred depending on type, availability and recommended spacing.
      (5) Plant material in sizes larger than the minimums stated above is acceptable.
   c. The following types of plantings are required:
      (1) Shade tree plantings.
      (2) Ornamental and coniferous tree plantings.
      (3) Shrub plantings.
      (4) Perennial and groundcover plantings.
      (5) Ornamental (low-maintenance) grass plantings.
      (6) Turf grass, seeded and sodded.
   d. Substitutions may be permitted only if proof is submitted to the Authority that specific plants or sizes are unobtainable.
   e. The substitution of fall planting hazard plant material will not be approved if predicated solely on seasonal expediency and convenience.
   f. Permanent erosion control plantings are not required.

4. A permanently installed automatic irrigation system shall be installed to provide 100% irrigation coverage of the proposed soccer field only.
   a. Provide conveniently located and appropriately sized tamper-proof water connections for standard hoses. Hoses for use by the school district shall be provided by the school district.
5. Where landscaping elements also must function as elements defined within another element group, meet the 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.

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′ 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 approved trees, shrubs, and ground covers, etc..
         (2) Provide a neat and tidy urban landscape.
         (3) Provide a landscape that will look complete within two years after planting, and that will remain of basically the same appearance indefinitely without significant pruning.
      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. All plant material used must be non-toxic if accidently 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-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-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-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-year maintenance period.

2. Insects, Disease and Damage: All supplied 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 and intact root balls.

E. Operation and Maintenance

1. Irrigation Water Source: Same as building supply.

2. Water Conservation

a. Conserve water wherever possible through the use of hand watering, Treegator® watering bags and soaker hoses during the maintenance period.

PRODUCTS

A. Plant materials: As specified.

B. Mulch

1. Double-shredded hardwood mulch 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.

b. Submit a sample of the natural color double-shredded hardwood mulch to the Authority for approval.

C. Steel Edgings for Beds

1. Basis of Design: Col-Met Item #1011-5 by Collier Metal Specialties; with 12" stakes; color green.

D. Irrigation System

1. Provide a complete, code-compliant in-ground automatic irrigation system, including all appurtenances, to provide complete coverage of the proposed soccer field and sidelines within the fence line.

2. Provide a full-coverage pop-up rotor system unless otherwise indicated.

3. Basis of Design

a. Controller: Irritrol KwikDial.

b. Rain sensor: Hunter Mini-Clik.

(1) Mount the rain sensor to the school facade in an approved, inconspicuous and secure manner per the manufacturer's recommendations.

c. Solenoid valves: Hunter SVR.

d. Valve boxes: Rain Bird VB-10RND-H.

e. Pop-up rotors: Hunter; commercial quality models as required to achieve full coverage based on local water pressure and system requirements.

f. Emitters: Not required.

4. Provide a complete system with all required equipment such as, but not strictly limited to: backflow preventer; anti-siphon equipment; control wiring; 1" copper pipe to solenoid valve; and all polyethylene and/or PVC irrigation pipe, swing arm assemblies and heads.

5. Locate controller and head end equipment in an appropriate and secure location such as the Engine Storage/Machine Room..

6. Provide maintenance data and training in compliance with Section 01820, Operation and Maintenance Data and Training.

a. After the irrigation system programming, testing, troubleshooting and acceptance, provide the first winterization service of the system, and on-site assistance/refresher training required by the district to assure proper operation the following spring.

7. Provide three (3) spare pop-up heads including complete swing arm assemblies, for each type and size used, to the school district for attic stock.

E. 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, continuously along the outside edge of the tree pit, with the extent of barrier overlap at the seam as recommended by the manufacturer.

c. Root barrier shall be installed with the top of the barrier positioned ½" below the elevation of the surrounding pavement (sidewalk or asphalt) surface, not at the tops of adjacent curbs or walls where present.

d. 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.

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

f. Trees planted in lawn areas do not require root barrier.

F. Fertilizer

1. Basis of Design for plant material: 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" from the root tips. Do not place tablets in the bottom of the hole. Complete topsoil backfill, tamp, water-in and mulch.

2. Application rates for fertilizer tablets:

(1) Perennials and ground cover in 1 gal. size containers: One 5-gram fertilizer tablet per plant.

(2) Shrubs in 1 gal. size containers: One 21-gram fertilizer tablet per plant.

(3) Shrubs in 3 gal. size containers: Two 21-gram fertilizer tablets per plant.

(4) Trees of varying sizes: One 21-gram fertilizer tablet for every ½" of caliper size.

3. Basis of Design for sod and seed beds:

(1) Commercial starter fertilizer with an N-P-K ratio of: 0.7(N: Nitrogen) -1.4(P: Phosphate) - 0.4(K: Potash) such as Lesco Seed Starter 3 by John Deere Landscapes, Inc.

(2) Application rates:

a. Rate by Hydroseeder: 40 lbs. per 100 gallons of water.

b. Rate by drop seeder or by hand distribution: 50 lb. per 750 sq. ft.

G. 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 Green Technologies, Inc., 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, evenly distributed, 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: An additional 3 tsp. of hydrophilic polymer crystals.

(c) Shrubs in 3-gal. size containers: An additional 5 tsp. of hydrophilic polymer crystals.

(d) Trees 2"- 2½" cal. size: An additional 3 tsp. of hydrophilic polymer crystals.

(e) Trees 2½"- 3" cal. Size: An additional 5 tsp. of hydrophilic polymer crystals.

(f) Trees 3½" - 4'cal. size: An additional 7 tsp. of hydrophilic polymer crystals.

H. Sod

1. The proposed soccer field, including the sideline areas within the fence, is the only area to be sodded.
2. Basis of Design: 80% tall fescue and 20% Kentucky bluegrass.
   a. Tall fescue: One or more of the following:
      (1) Silverstar.
      (2) Olympic Gold.
      (3) Apache III.
      (4) Masterpiece.
      (5) Bingo.
   b. Kentucky bluegrass: One or more of the following:
      (1) Award.
      (2) Tsunami.
      (3) Midnight II.
      (4) NuDestiny.

I. Seeded Turfgrass Areas.

1. Provide blue tag certified seed only.
2. Basis of Design: Custom mix consisting of seed which matches the varieties and percentages of the supplied sod, with the addition of 10% approved nurse grass such as annual ryegrass.
3. Submit proposed custom seed mix to the Authority for approval.

J. Ornamental (low-maintenance) Grass

1. Provide blue tag certified seed only.
2. Basis of Design: Custom mix consisting of the following:
   a. 20% "Gotham" Hard Fescue.
   b. 20% "Spartan II" Hard Fescue.
   c. 15% "Zodiac" Chewings Fescue.
   d. 15% "7 Seas" Chewings Fescue.

e. 15% "Fortitude" Strong Creeping Red Fescue.

f. 15% "Epic" Strong Creeping Red Fescue.

K. Organic Compost Soil Amendment

1. Organic compost soil amendment shall be certified not to contain any of the following:

a. Sludge, bio-solids or human waste.

b. Peanut hulls.

c. Vermiculite, perlite, bark or peat.

d. Trash or debris of any kind.

e. Partially composted vegetative or organic matter of any type.

f. Persistent herbicides such as picloram, clopyralid or aminocyclopyrachlor.

L. Tackifier

1. Basis of Design: Hydrostraw FiberRX, as manufactured by Hydrostraw, LLC, Manteno, IL.

2. Minimum rates of application: On slopes steeper than 2:1, use 90 pounds per acre. On level ground and slopes up to 2:1, use 50 lbs. per acre.

M. Fiber Mulch

1. Basis of Design: Seed Aide®-CoverGrow™ granular mulch, as manufactured by PROFILE Products, LLC, Buffalo Grove, IL.

2. Application rates:

a. Hydroseeder: Flat to 5:1 slopes – apply at 1,500 lbs./ac, increasing to 3,000 lbs./ac on slopes of 3:1 or greater.

b. Broadcast or hand: Flat to 5:1 slopes – apply at 50 lbs./1,000 sq. ft., increasing to 75 lbs./1,000 sq. ft. on slopes of 4:1 or greater.

METHODS OF CONSTRUCTION

A. Seed Bed (turf) Sod Bed Preparation

1. Rototill native soil to a depth of 6"; then rake to remove roots, vegetation, debris and all rocks over one inch in diameter.

2. Supply and spread screened organic compost soil amendment over area to be seeded or sodded at the rate of one cu. yd. of compost per 1000 sq. ft.

3. Till, disc or harrow organic compost soil amendment into the tilled and raked native soil to a depth of four inches.

4. Re-grade and fine grade amended seed beds and sod bed to eliminate any irregularities or low spots.

a. Maintain a consistent grade of the seed bed/sod bed at ½" below surrounding walks, edging, curbs or other hard surfaces.

5. Test native soil and spread pelletized dolomitic lime if required to maintain pH of at least 5.5 by applying up to a maximum of 50 lbs. of pelletized lime per 1000 sq. ft. of sod bed only.
6. Spread a commercial starter fertilizer at the prescribed rate to the top of the prepared sod bed immediately prior to seeding or sodding.

B. Seeding of ornamental (low-maintenance) grass areas and turf grass seeded areas.

1. Ornamental (low-maintenance) grass areas include all areas which receive sufficient sun, and which the district would prefer to not mow regularly during the growing season and that are not athletic fields.
2. Spread a commercial starter fertilizer at the prescribed rate to the top of the prepared seed bed immediately prior to seeding or sodding.
3. Seed ornamental (low-maintenance) grass areas and turf grass seeded areas using either a mechanical seeder or a hydroseeder.
   a. Achieve an application rate with uniform minimum distribution of 6 lbs. per 1,000 sq. ft.
4. Place a uniform layer of fiber mulch and water thoroughly. Fiber mulch application via hydroseeder is acceptable.
5. Tack the fiber mulch with guar tackifier or other natural, organic polysaccharide that contains no additives. Apply following the manufacturer's recommendations.
6. Water the seeded areas a minimum of once daily for the next four weeks.
7. Do not mow ornamental (low-maintenance) grass areas during the growing season.
   b. Cut-back seed heads (only) at the end of the growing season, to maintain a neat appearance over the winter.
8. Maintain all turfgrass seeded areas at a height of 2½" through regular mowing until acceptance, and for the duration of the two-year maintenance period.
9. Remove all dirt and debris and leave adjacent paved areas broom clean.

C. Sodding

2. Deliver sod to the site after sod bed has been prepared and approved, the weather is favorable, the area is accessible and the sod is ready to be installed.
3. Deliver sod on the same day that it is to be installed.
4. Butt edges and ends of sod pieces/rolls together tightly to avoid gaps and overlaps.
   a. Stagger joints in each row.
5. Roll entire area after installation of sod to ensure full sod contact with the soil.
6. Water immediately after rolling.
7. Continue regular daily watering schedule as required by prevailing weather conditions until sod is firmly rooted which usually requires two weeks to occur.
8. Maintain sod at a height of 2½" until acceptance, and for the duration of the two-year maintenance period.

a. Do not mow before sod is established and at a height of no less than 3 inches.

9. Remove all pallets, sod scraps, dirt and debris and leave area broom clean.

D. Perennials and groundcover: Groundcover 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.

1. Groundcover 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.

E. 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 or 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 days after planting.

4. Pruning shall be done in accordance with standard horticultural practice, to preserve the health, natural character, form and symmetry of the plant material.

5. 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.

6. Upon completion of the two-year maintenance agreement, the Design-Builder shall remove and dispose of any residual tree wrap, stakes, guy wires etc.

F. Seeding to Restore Areas Disturbed by Construction.

1. Follow all seed bed preparation techniques and procedures.

1. Utilize industry-standard one-step hydroseeding practices to re-establish areas of existing turf disturbed or damaged during construction.

2. Utilize turfgrass seed mix which matches the varieties and percentages of the supplied sod or other approved mix.

3. Utilize Seed Aide®-CoverGrow™ (or approved equal) fiber mulch, and guar tackifier applied per the manufacturer's recommendations.

4. Remove any hydroseeding slurry overspray immediately.

END OF SECTION G2080.00

SECTION G3000.00

LIQUID AND GAS SITE UTILITIES

I. 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) (if any) 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. Pedestrian safety: Provide grates and drains that are bike-safe and in compliance with the New Jersey Barrier-Free Subcode.
3. Unauthorized access: Provide locking devices to stop unauthorized access.
4. Excess pressure: Provide pressurized components that will withstand operational pressures without failure and to relieve or reduce excessive pressure to prevent failure.
5. Electrical shock: Isolate electrical conductors from personnel.
6. Accidental explosion: Provide equipment designed to withstand electromotive forces without catastrophic failure.
7. Misuse: Minimize misuse that could result in damage to property, injury, or loss of life.
8. Hazardous materials: Piping carrying flammable liquids and toxic materials clearly labeled.
9. Vermin resistance: Provide components that are resistant to the entry of and damage caused by rodents and insects.

D. Structure

1. Concealed or buried piping and components: Provide code-compliant 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 42″ or 6″ below local frost depth.
   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″ 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 24" 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 2,000 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' or as required by code.
            (2) Maximum cleanout spacing: 50' or as required by code.
        d. Provide drains and inlets with replaceable covers.

G. See 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.

II. PRODUCTS

A. Select all products to comply with applicable codes and local standards and utility requirements.

B. Sanitary Sewer

1. Pipe
   a. Use one or more of the following:
      (1) HDPE/PVC pipe and fittings.
      (2) Cast iron, hub and spigot.
   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 interceptors and oil separator tanks: Provide heavy-duty commercial units located in underground, lined precast concrete pits with covers.

C. Storm Sewer

1. Pipe
   a. Use one or more of the following:
      (1) Reinforced concrete pipe (RCP).
      (2) HDPE 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) Reinforced concrete pipe.
3. Storm Drains
   a. Use one or more of the following:
      (1) Cast iron.
      (2) Type "J-ECO" stamped "DUMP NO WASTE – DRAINS TO RIVER"
   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 bolted Type Q grates.
   b. Provide units and installation in compliance with all project requirements including code requirements for barrier-free access.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G3000.00

SECTION G3030.00

STORM DRAINAGE UTILITIES

I. PERFORMANCE

A. Basic Function

1. Provide storm drainage components as required by the project program and by code to maintain adequate drainage, control soil erosion, control stormwater quantity.
2. It is anticipated that construction of the new school will result in a reduction in impervious surfaces of almost 2%. Based on this information, preliminary meetings with NJDEP and the Trenton Public Works Department indicate that a subsurface system is not required for the new school, and that stormwater may be connected directly to the City stormwater system. The Design-Builder is responsible for re-confirming these requirements.
3. The Authority has met with both NJDEP and the Trenton Public Works Department and determined that the authority having jurisdiction is the Trenton Public Works Department, whose authority begins at the connection(s) to the mains. The Department has no authority over any connection or piping constructed within the site.
4. The storm drainage system requires the following activities:
   a. Grading of the site for the collection of stormwater runoff.
   b. Construction of appropriate, properly sized underground conveyance systems such as underground pipe runs, manholes, stormwater inlets and outlets.
   c. Adherence to the structural requirements for the stormwater conveyance system due to hydraulic loads, as well as static and dynamic earth loads.
5. Grading and collection: Grade the project site to maintain adequate drainage during small-volume precipitation events. Provide inlets and roof drains to collect stormwater runoff.
6. Incorporate nonstructural stormwater management strategies into the design as required by N.J.A.C. 7:8-5.3.
7. Underground stormwater pipes: Provide adequate underground piping system with sufficient capacity to convey stormwater runoff safely to discharge locations in accordance with the requirements of authorities having jurisdiction.
8. Provide structural stormwater management measures which may include trenches, subsurface basins, dry wells and other related measures such as total suspended solid (TSS) filters.
9. Design-Builder must demonstrate through hydrologic and hydraulic analysis that the stormwater control systems meet the minimum design and performance standards and all applicable codes and regulations.
10. 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. Leakage: Provide underground pipe systems which are leak-free.

2. Accessibility: Provide clearances around components that are adequate for service and use.
3. Appearance: Grade and stabilize soil layers over the structure and take appropriate measures as described in Section G2080.00.

C. Health and Safety

1. Barrier-free access and safety from injury: Stormwater inlets shall comply with requirements of the New Jersey Department of Transportation (NJDOT) and the New Jersey Barrier-Free Subcode.
2. Unauthorized access: Provide fences and locking devices to stop unauthorized access to the site.

D. See Section G0000.00, Sitework, for additional requirements and restrictions.

II. PRODUCTS

A. Select all products to comply with applicable codes and local standards and utility requirements.

B. Grading and Stormwater Collection

1. Construct all impervious surfaces at no less than a 1.0% grade or as can be practically achieved and all pervious surfaces at no less than a 2.0% grade. Construction must be in compliance with all codes and requirements of authorities having jurisdiction.
2. Provide roof drains and collection pipes with fittings and appurtenances according to applicable standard specifications recommended by American Society of Testing and Materials (ASTM) and American Water Works Association (AWWA).

C. Underground Stormwater Pipes

1. Provide underground pipe system with sufficient capacity to convey stormwater runoff safely for 25-year storm events in non-Flood Hazard Areas, and for 10-year storm events in Flood Hazard Areas, or in accordance with the requirements of authorities having jurisdiction.
2. Underground pipe system shall comply with all codes and requirements of authorities having jurisdiction.
3. Pipes with fittings and appurtenances shall comply with applicable standard specifications recommended by American Society of Testing and Materials (ASTM) and American Water Works Association (AWWA).
4. Following completion of construction, clean all stormwater sewers and structures, including existing structures and pipe connections.

D. Structural Stormwater Management Measures (if required)

1. Design and construct subsurface detention basins and dry wells to store the stormwater runoff at the project site as part of the required stormwater quality and quantity management.
2. Design and install subsurface detention basins according to New Jersey Stormwater Best Management Practices Manual and comply with all codes and requirements of authorities having jurisdiction.

3. The work may include, without limitation, the following:
   a. Trench/basin excavation.
   b. Bedding of all piping and structures.
   c. Installation of pipes and fittings.
   d. Installation of inlets, catch basins, trench drains, area drains and manholes including all necessary appurtenances and connections.
   e. Backfilling and compaction of the excavation with stone as indicated in trenching details.
   f. Placement, compaction and grading of pavement or cover soil to reach designed final grade.
   g. Connections to city stormwater mains.
4. Pipes with fittings and appurtenances shall comply with applicable standard specifications recommended by American Society of Testing and Materials (ASTM) and American Water Works Association (AWWA).
5. Catch Basins and Manholes
   a. Catch basins and manholes shall be precast reinforced concrete with minimum compressive strength of 4,000 psi in 28 days, conforming to ASTM Specification C 478, C150, C33 and C 913.
   b. Joints shall conform to the requirements for rubber gaskets as specified under the latest ASTM standards C 443 and C990.
6. Total Suspended Solid Filters
   a. The system may include an offline manufactured treatment devices.
   b. Filtration devices must be NJDEP approved.
7. Topsoil shall be as specified in Section G1070.20.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G3030.00

SECTION G4010.00

SITE ELECTRIC DISTRIBUTION SYSTEMS

I. PERFORMANCE

A. Basic Function

1. Provide the following site services:

   a. Electrical power: Adequate supply of power for all project functions.

2. Service Description

   a. Public Service Gas & Electric (PSE&G) will provide high-voltage underground service from its pole through an electrical service manhole system that is to be provided by the Design-Builder and approved by PSE&G.

   b. PSE&G will make the final connections of this service to the high-voltage switch that is to be furnished and installed by the Design-Builder.

   c. The Design-Builder is responsible for the following:

      (1) Construction of the electrical service manhole system in accordance with code and all PSE&G requirements.

         (a) Provide two active and two spare conduits from the utility pole through the manhole system to the switchyard and from the switchyard to the Main Electrical Room.

      (2) Construction of the switchyard, including installation of a fused 15kv main switch and metering section. The meter will be furnished and installed by PSE&G.

      (3) Continuation of the service from the high-voltage main switch and meter to two high-voltage switches and two primary transformers located in the building's Main Electrical Room.

      (4) Furnishing and installation of two high-voltage switches and two 3000 kva transformers within the Main Electrical Room.

      (5) All subsequent switchgear and electrical work.

   d. All work must be performed in accordance with applicable codes and standards and all PSE&G standards and requirements, specifically including the PSE&G documents *Information and Requirements for Electrical Service* and *Plant Engineering Policies and Procedures.*

3. Where site electric distribution system elements must also function as elements defined within another element group, meet 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. 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.

C. Health and Safety

1. Comply with the most stringent requirements of authorities having jurisdiction.
2. Safety hazards: Avoid using products that create safety hazards wherever possible; where services must involve flammable materials or hazardous operations, comply with code.
3. Fire source: Provide site electrical elements which are incombustible.
4. Electrical shock prevention: Provide a means of disconnecting power at each piece of equipment.
5. Unauthorized access: Provide locking devices to stop unauthorized access.
6. Electrical shock: Isolate electrical conductors from personnel.
7. Accidental explosion: Provide equipment designed to withstand electromotive forces without catastrophic failure.
8. Misuse: Minimize misuse that could result in damage to property, injury, or loss of life.
9. Vermin resistance: Provide components that are resistant to the entry of and damage caused by rodents and insects.

D. Structure

1. Concealed or buried piping and components: Provide code-compliant 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. Burial depth of piping: In accordance with code.
    b. Electrical equipment: Provide equipment which is in compliance with NEMA 3R unless the location dictates a more stringent requirement such as NEMA 4 or 4X.
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, tanks and components, sufficient to prevent corrosion completely for the service life of the element without maintenance.

(1) 3" 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 24" below surface of ground.

c. Underground conduit and piping: Watertight and rootproof.

F. Operation and Maintenance

1. Capacity: As required by code.

a. Provide electrical equipment which can be modified to increase service capacity in the future.

2. Ease of use: Provide easy access to and working clearances around system components.

3. Minimization of misuse: Provide locking devices to stop unauthorized access.

4. Ease of cleaning: Provide electrical distribution elements with removable access panels to allow cleaning.

5. Ease of maintenance: Provide electrical distribution elements which are modular in design.

G. See Section G0000.00, Sitework, for additional requirements and restrictions.

II. PRODUCTS

A. Primary Transformers

1. Basis of Design: UNIClad encapsulated dry type transformer by Virginia Transformer Corp.

B. Conductors

1. High-voltage cables shall match PSE&G cables for material and insulation type.

2. Conductor size(s) shall be as required by code.

C. Conduits

1. Use one or more of the following:
   a. Nonmetallic conduit encased in concrete.
2. Do not use:
   a. Rigid metal conduit.
   b. Electrical metallic tubing.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G4010.00

SECTION G5010.00

SITE COMMUNICATIONS SYSTEMS

I. PERFORMANCE

A. Basic Function

1. Provide the following site services:
   a. Communications: Power and connectivity for all telecommunications, surveillance and security systems.
2. Where site communications system elements must also function as elements defined within another element group, meet requirements of both element groups.
3. 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. Leakage: Provide communications systems which are leak-free.
2. Accessibility: Provide clearances around components that are adequate for service and use.

C. Health and Safety

1. All electrical work shall be designed and installed in accordance with the latest edition of the National Electrical Code (NEC) and all applicable state and local codes.
   a. Comply with the most stringent requirements of authorities having jurisdiction.
2. Safety hazards: Avoid using products that create safety hazards wherever possible; where services must involve flammable materials or hazardous operations, comply with code.
3. Fire source: Provide site electrical elements which are incombustible.
4. Electrical shock prevention: Provide a means of disconnecting power at each piece of equipment.
5. Unauthorized access: Provide locking devices to stop unauthorized access.
6. Electrical shock: Isolate electrical conductors from personnel.
7. Accidental explosion: Provide equipment designed to withstand electromotive forces without catastrophic failure.
8. Misuse: Minimize misuse that could result in damage to property, injury, or loss of life.
9. Vermin resistance: Provide components that are resistant to the entry of and damage caused by rodents and insects.

D. Structure

1. Concealed or buried piping and components: Provide code-compliant 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: Boxes, enclosures, and cabinets installed indoors shall be NEMA 1 (clean rooms) or NEMA 12 (mechanical rooms); those installed outdoors or in wet environments shall be NEMA 3R unless the location dictates a more stringent requirement such as NEMA 4 or 4X.
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, tanks and components, sufficient to prevent corrosion completely for the service life of the element without maintenance.
      (1) 3" 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 24" below surface of ground.
   c. Underground conduit and piping: Watertight and rootproof.

F. Operation and Maintenance

1. Capacity: As required by code.
2. Ease of use: Provide easy access to and working clearances around system components.
3. Minimization of misuse: Provide locking devices to stop unauthorized access.
4. Ease of cleaning: Provide electrical distribution elements with removable access panels to allow cleaning.
5. Ease of maintenance: Provide electrical distribution elements which are modular in design.

G. See Section G0000.00, Sitework, for environmental requirements and restrictions.

II. PRODUCTS

A. Conduits

1. Use one or more of the following:
   a. Nonmetallic conduit with wires for direct burial.
   b. Nonmetallic conduit with wires to be encased in concrete.
2. Do not use:
   a. Rigid metal conduit.
   b. Electrical metallic tubing.

III. METHODS OF CONSTRUCTION

(not used)

END OF SECTION G5010.00

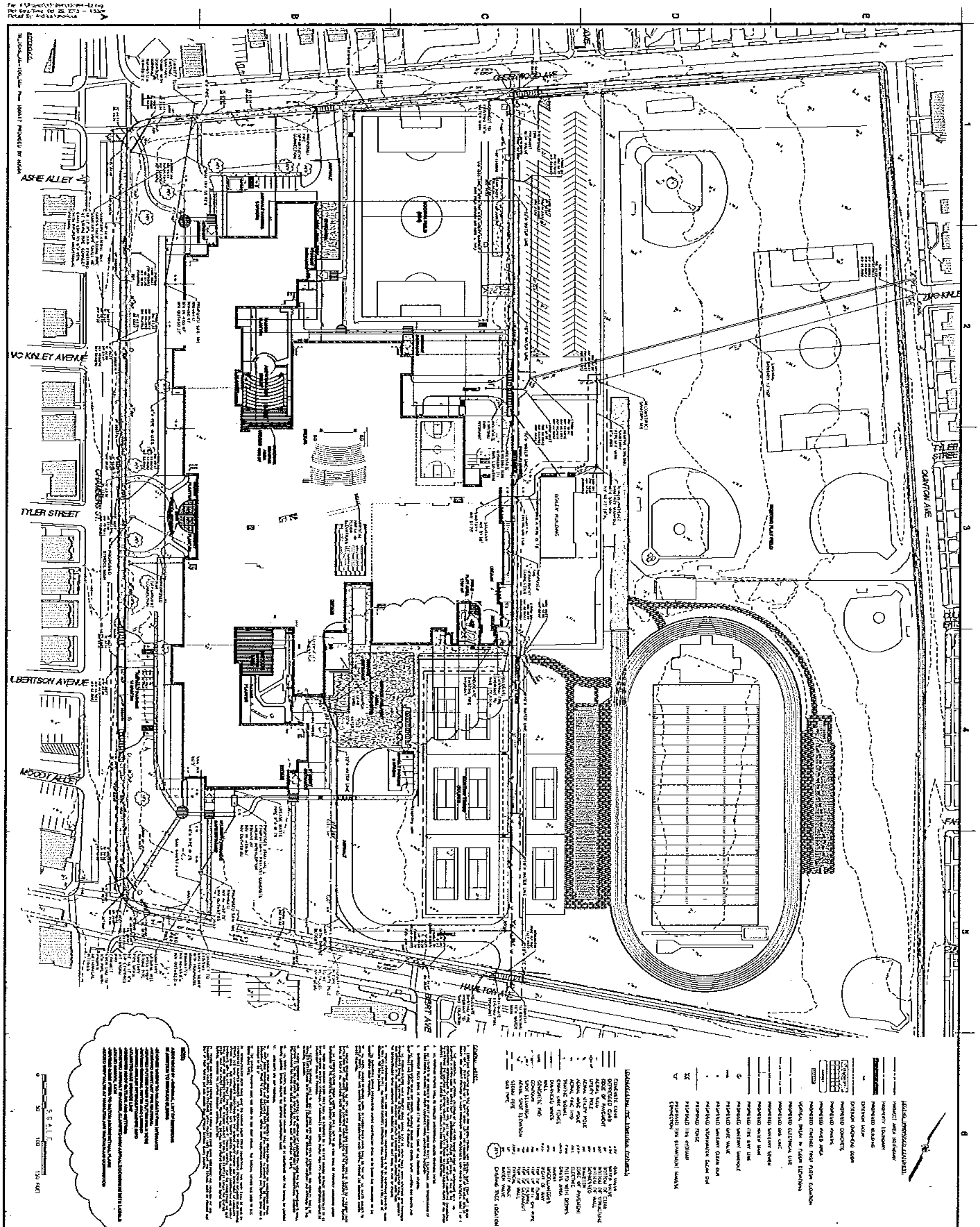
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

CDM
720 Horizon Center Boulevard
Trenton, New Jersey 08691

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

CONCEPTUAL GRADING PLAN
400 CHAMBERS STREET
TRENTON, NEW JERSEY

CG-101



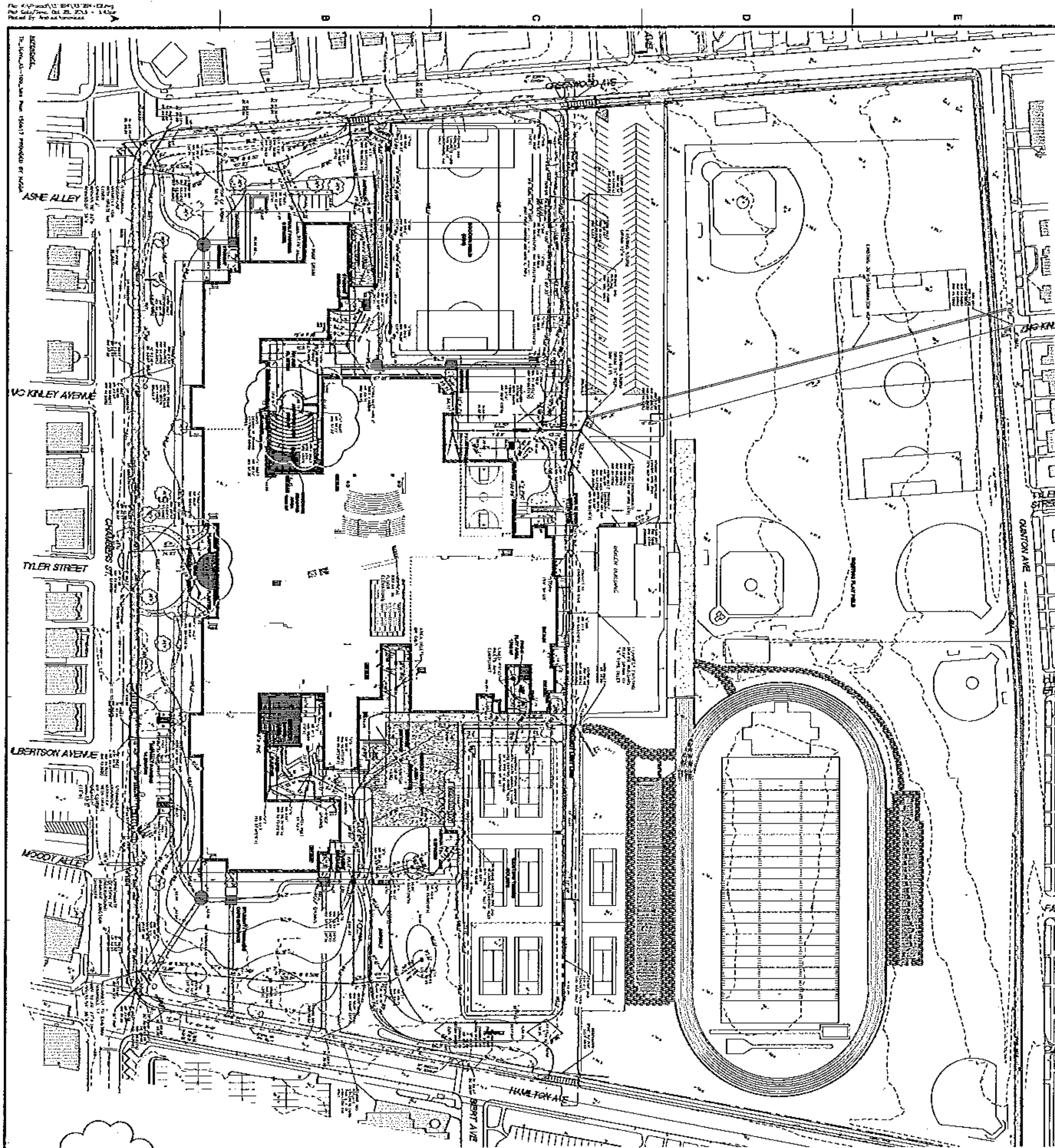
STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

CME
200 Horizon Center Boulevard
Trenton, New Jersey 08691

CONCEPTUAL POTABLE
WATER, GAS, ELECTRIC AND
SANITARY SEWER PLAN
400 CHAMBERS STREET
TRENTON, NEW JERSEY

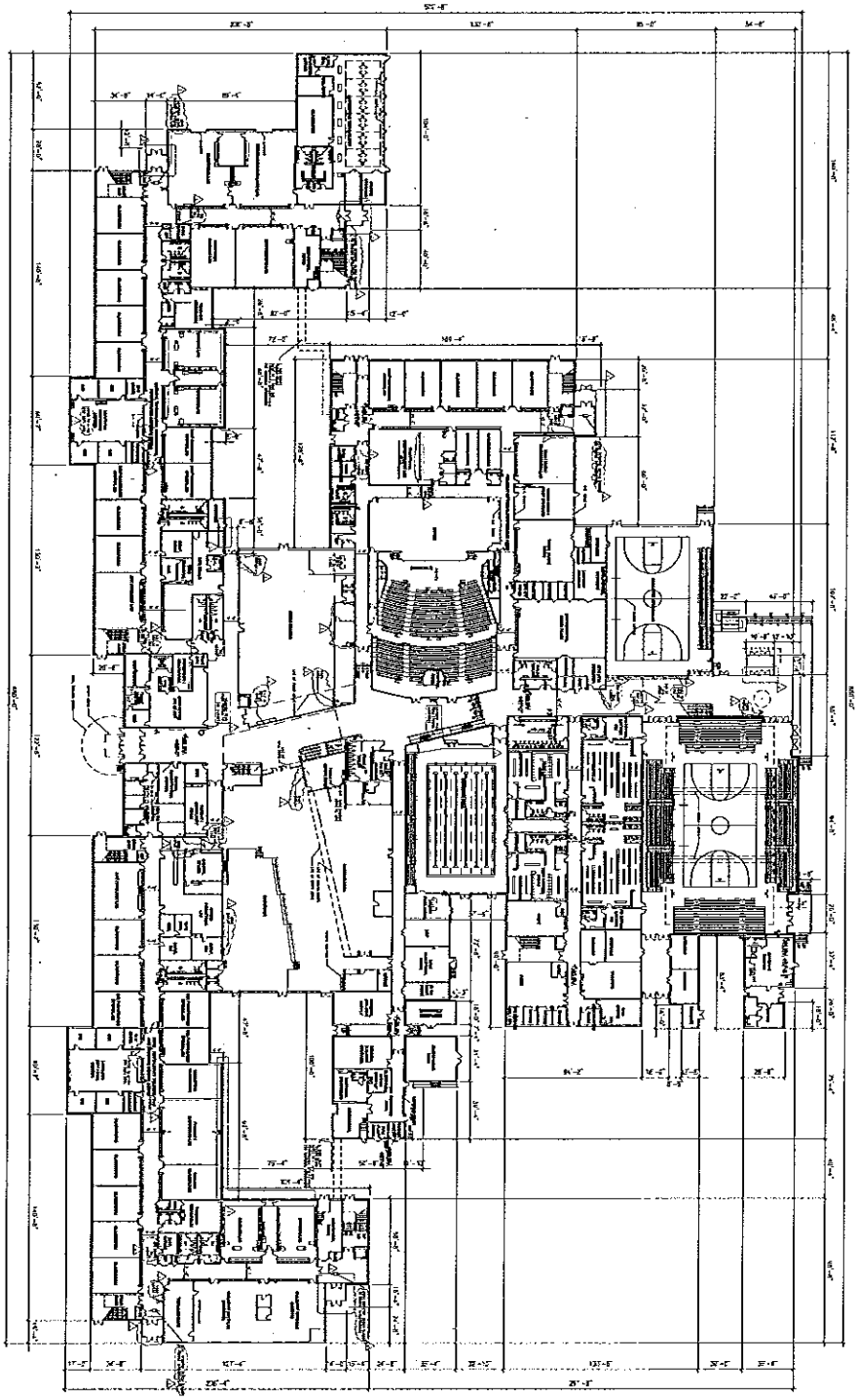
CU-101



STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

CU-102



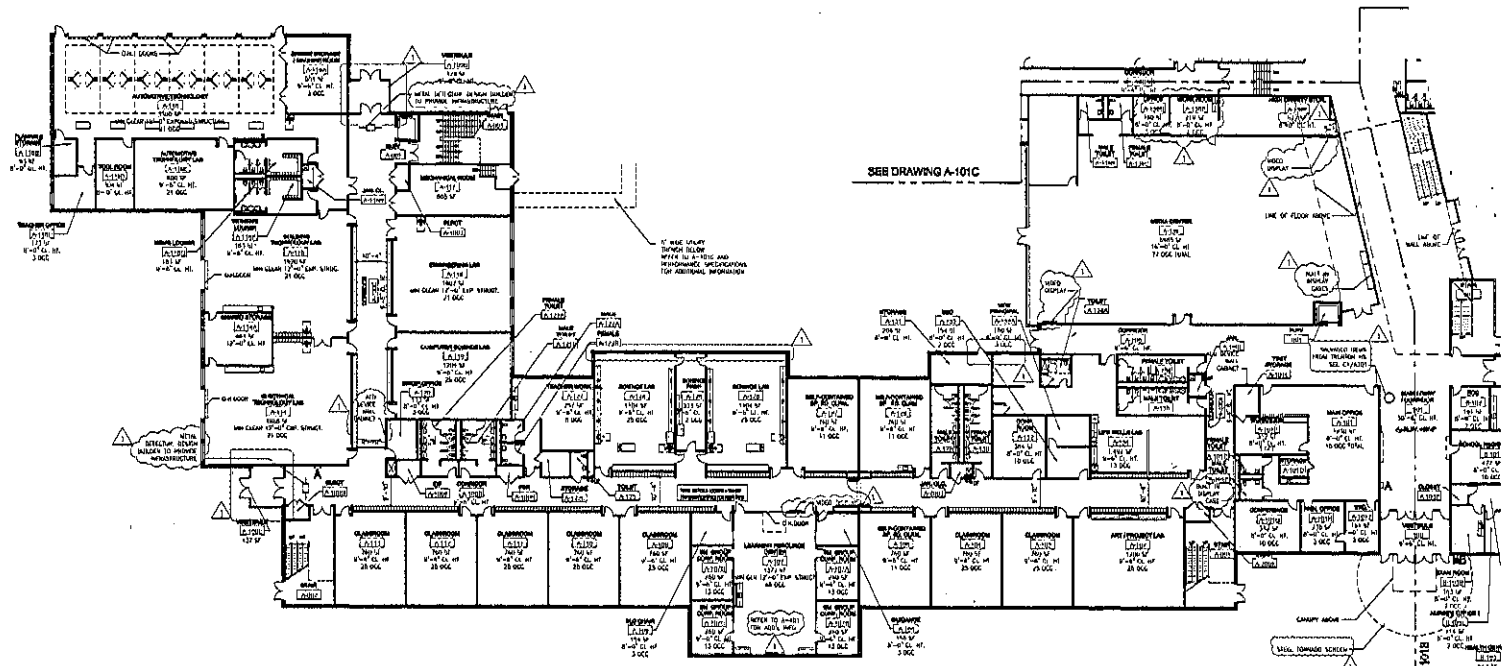
A3 FIRST FLOOR PLAN
1/32" = 1'-0"

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

OVERALL
FIRST FLOOR PLAN

A-101



B3 PARTIAL FIRST FLOOR PLAN
SECTOR A

A3 KEY PLAN
NOT TO SCALE

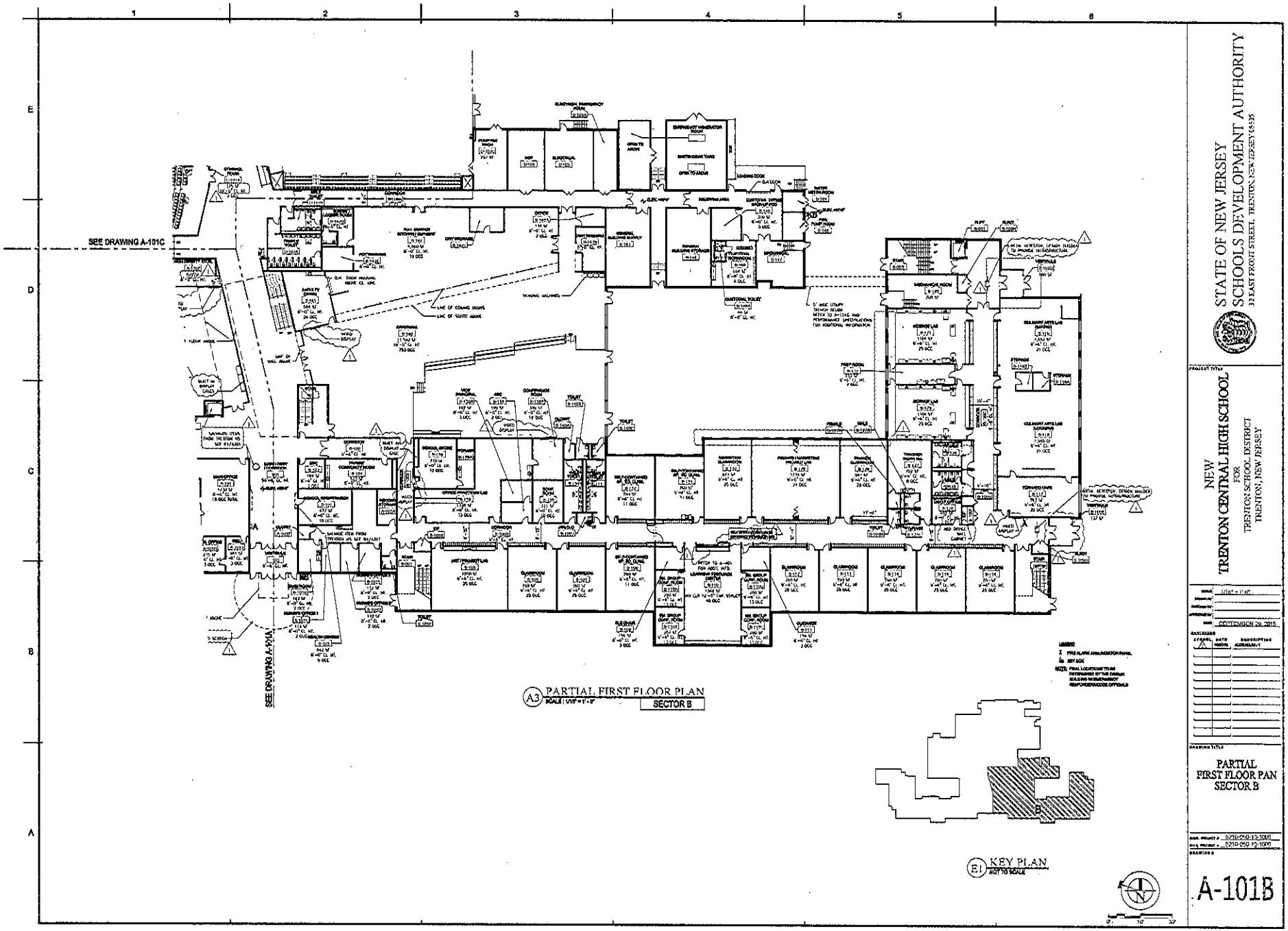
STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

DATE: SEPTEMBER 29, 2019

PARTIAL
FIRST FLOOR PLAN
SECTOR A

A-101A



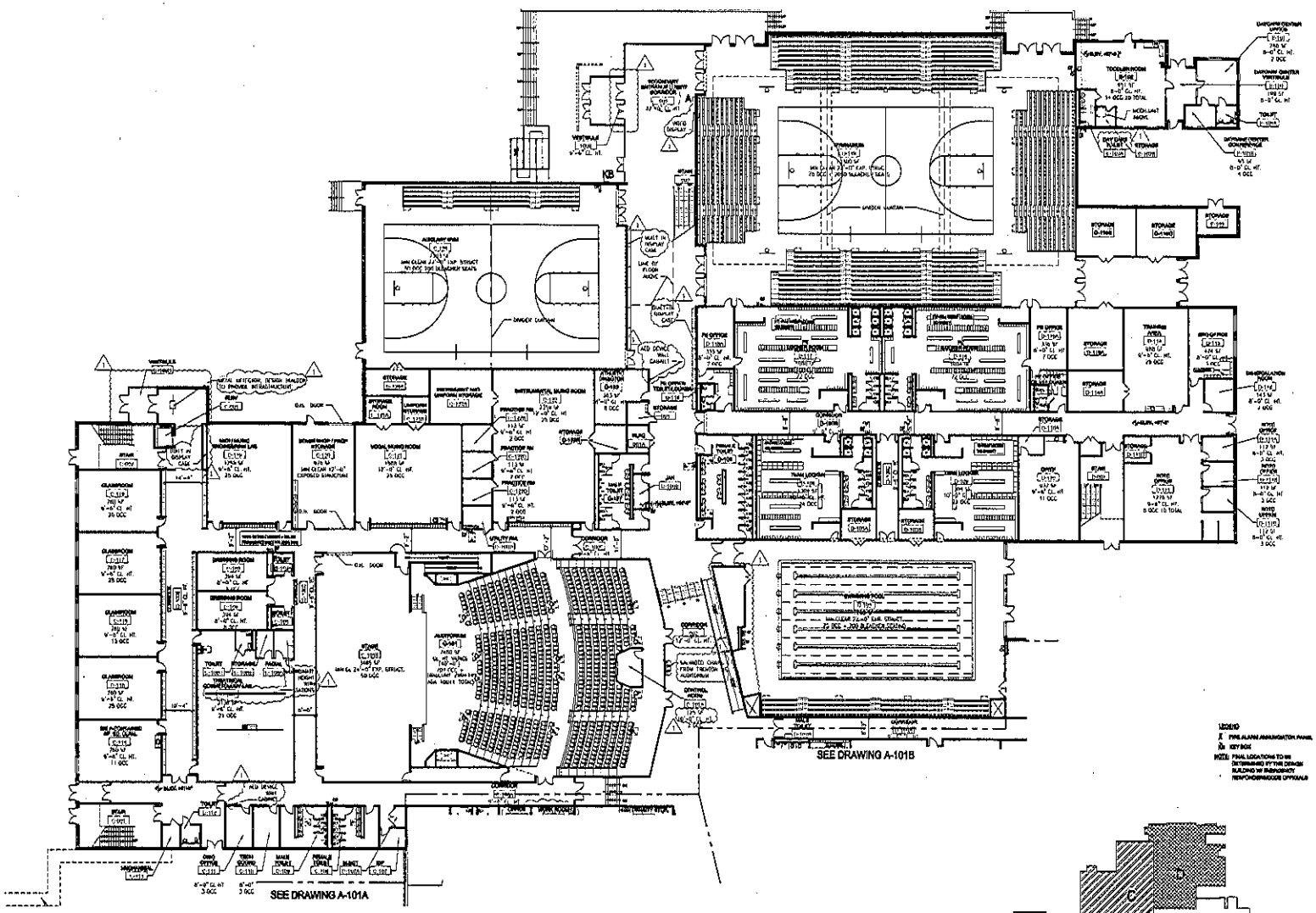
STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SEPTEMBER 20, 2013

PARTIAL
FIRST FLOOR PAN
SECTOR B

A-101B



A3 PARTIAL FIRST FLOOR PLAN
SECTOR C & D

E1 KEY PLAN
NOT TO SCALE

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

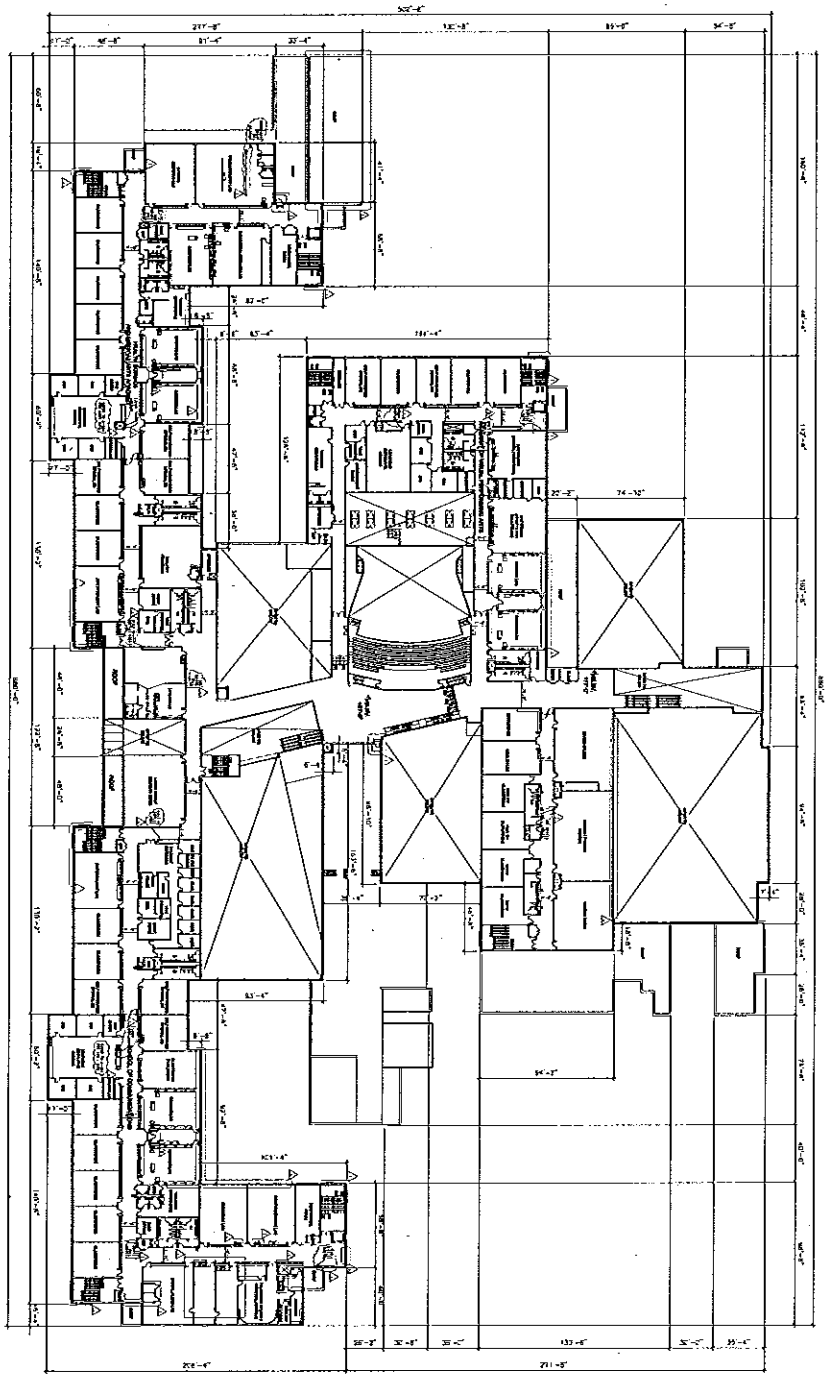
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SEPTEMBER 20, 2013

PARTIAL
FIRST FLOOR PLAN
SECTOR C & D

SDA Project # 3210-050-13-1000
NJDA Project # 3210-050-13-1000

A-101C



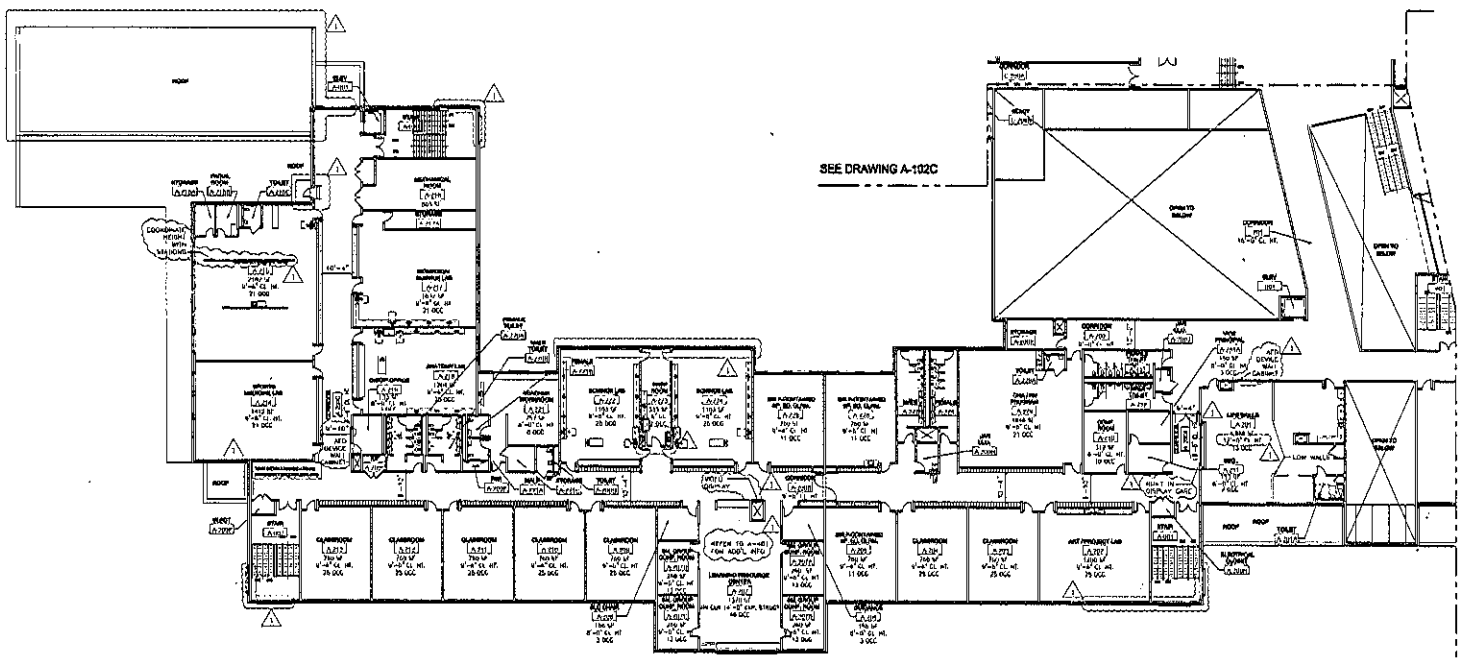
A3 SECOND FLOOR PLAN
1/32" = 1'-0"

A-102

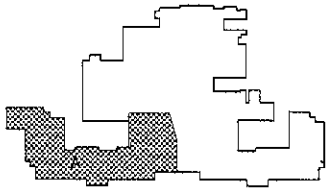
OVERALL SECOND FLOOR PLAN

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625



A3 PARTIAL SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"
SECTOR A



E1 KEY PLAN
NOT TO SCALE

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR:
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE 1/16" = 1'-0"
DRAWN BY
DESIGNED BY
APPROVED BY
DATE SEPTEMBER 29, 2010

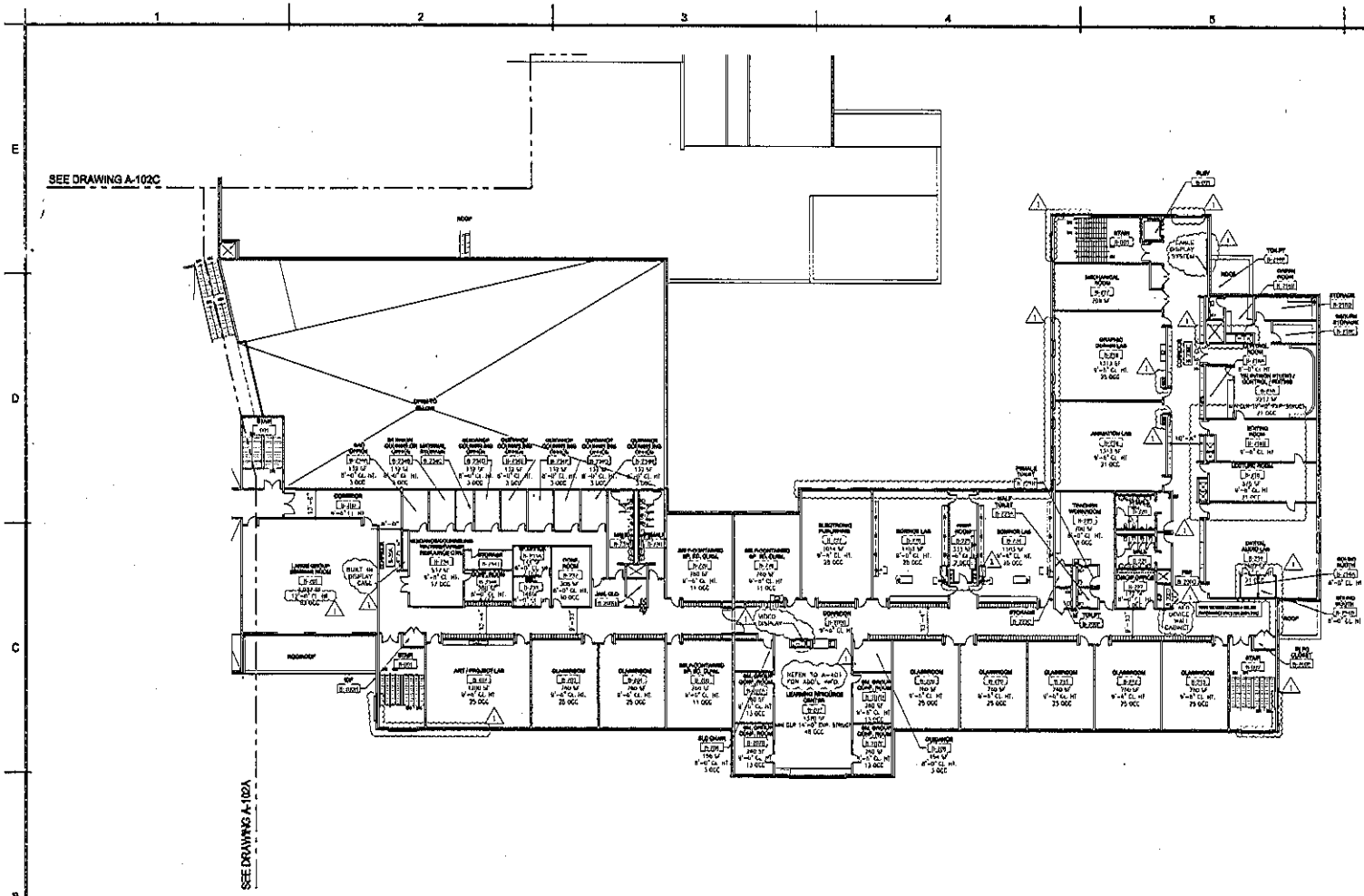
REVISIONS

#	SYMBOL	DATE	DESCRIPTION
1			ADDENDUM 1

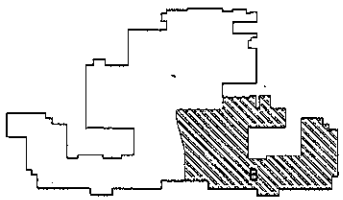
DRAWING TITLE
PARTIAL
SECOND FLOOR PLAN
SECTOR A

SDA PROJECT # 0210-050-12-1000
DEA PROJECT # 0210-050-13-1000
DRAWING #

A-102A



A3 PARTIAL SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"
SECTOR B



E1 KEY PLAN
NOT TO SCALE

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

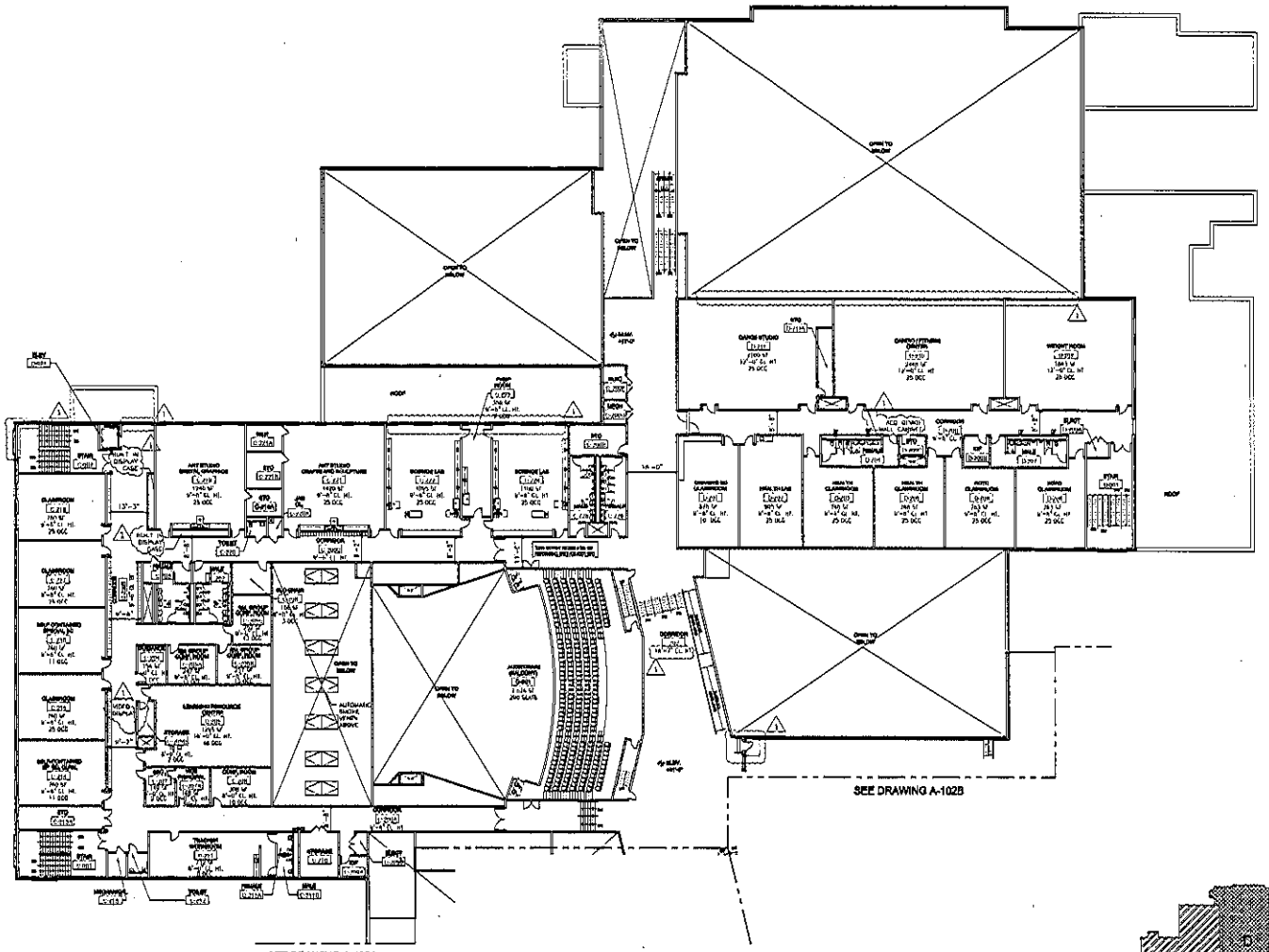
SCALE 1/16" = 1'-0"
DRAWN BY
CHECKED BY
PROJECT NO.
DATE SEPTEMBER 29, 2015

REVISIONS
SYMBOL | DATE | DESCRIPTION
1 | 10/07/15 | ADDENDUM 1

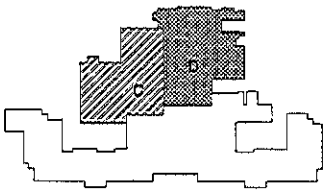
DRAWING TITLE
PARTIAL
SECOND FLOOR PLAN
SECTOR B

NJSA PROJECT # 5210-050-13-1000
NJSA CONTRACT # 5210-050-13-1000
DRAWING #

A-102B



A3 PARTIAL SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"
SECTOR C & D



E1 KEY PLAN
NOT TO SCALE

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE: 1/16" = 1'-0"
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE: SEPTEMBER 20, 2013

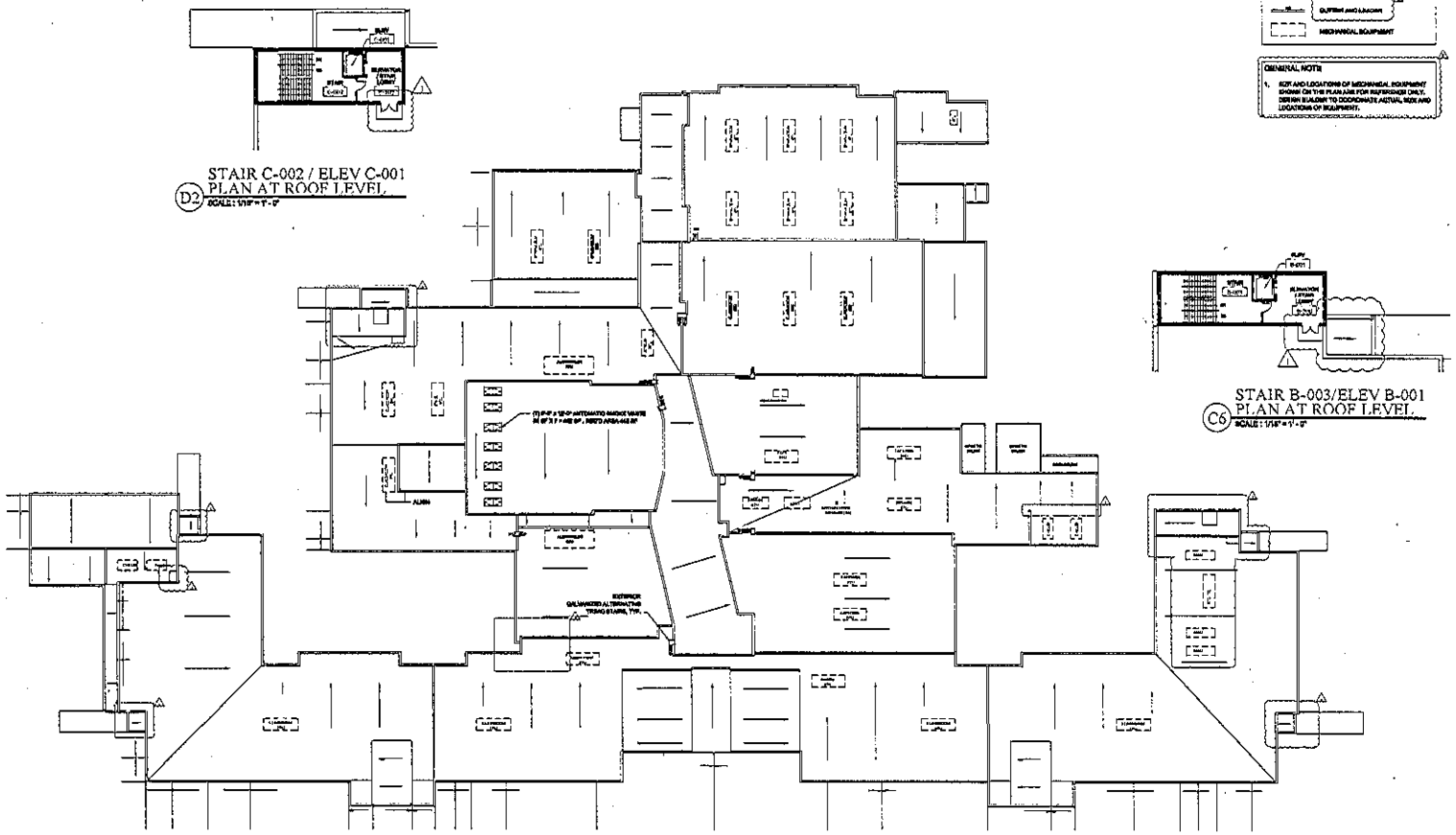
REVISIONS

SYMBOL	DATE	DESCRIPTION
1		ADDENDUM 1

PARTIAL
SECOND FLOOR PLAN
SECTOR C&D

SDA PROJECT # 3220-050-13-1000
CDA PROJECT # 1250-050-13-1000
DRAWING #

A-102C



D2 STAIR C-002 / ELEV C-001 PLAN AT ROOF LEVEL
SCALE: 1/16" = 1'-0"

C6 STAIR B-003/ELEV B-001 PLAN AT ROOF LEVEL
SCALE: 1/16" = 1'-0"

A4 ROOF PLAN
SCALE: 1/32" = 1'-0"

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE: 1/32" = 1'-0"
DRAWN BY:
REVIEWED BY:
APPROVED BY:
DATE: SEPTEMBER 24, 2015

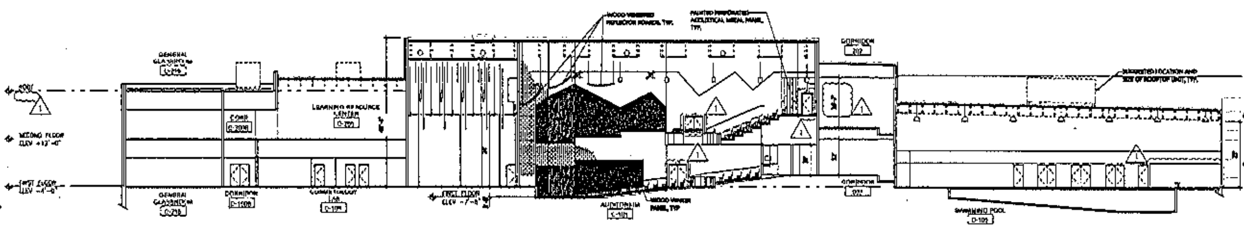
REVISIONS

SYMBOL	DATE	DESCRIPTION
1	10/8/15	ADDENDUM #1

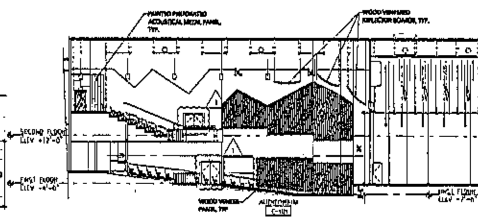
DRAWING TITLE
ROOF PLAN

SDA PROJECT # 0210-050-13-1600
EFA PROJECT # 0210-050-13-1600
DRAWING #

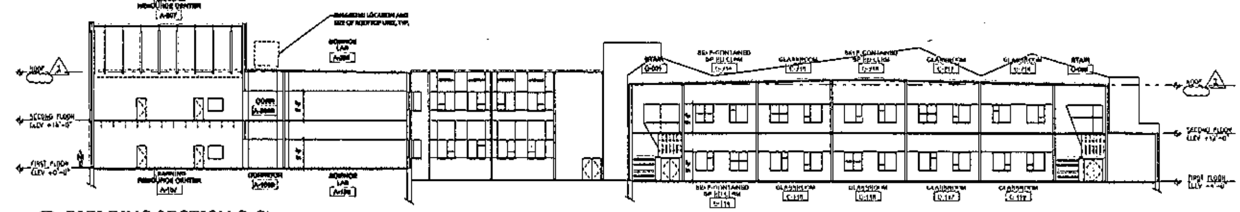
A-103



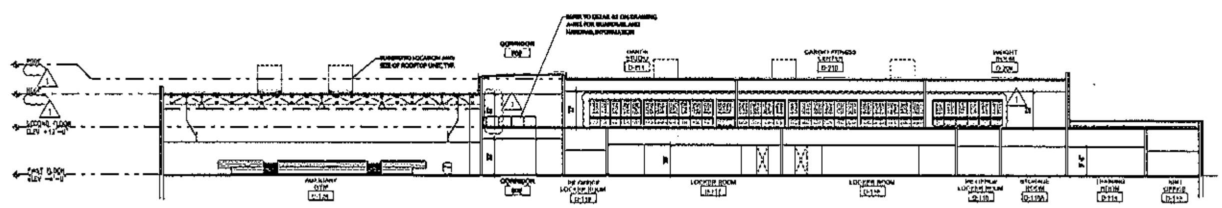
(E1) BUILDING SECTION F-F'
SCALE: 1/16" = 1'-0"



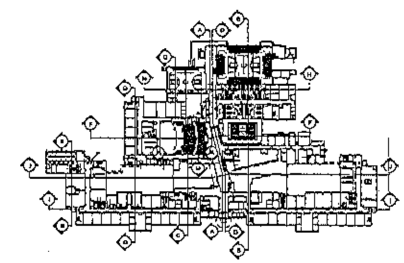
(E5) PARTIAL BUILDING SECTION K-K'
SCALE: 1/16" = 1'-0"

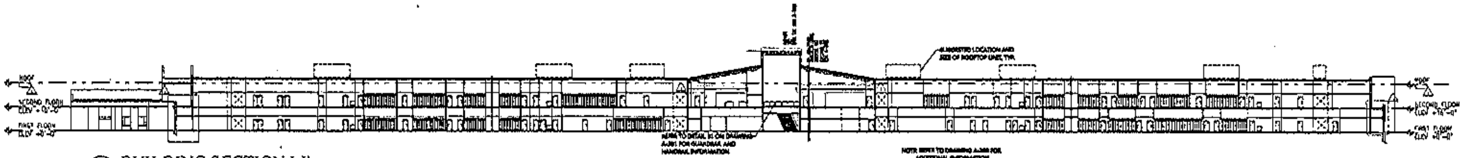


(D1) BUILDING SECTION G-G'
SCALE: 1/16" = 1'-0"

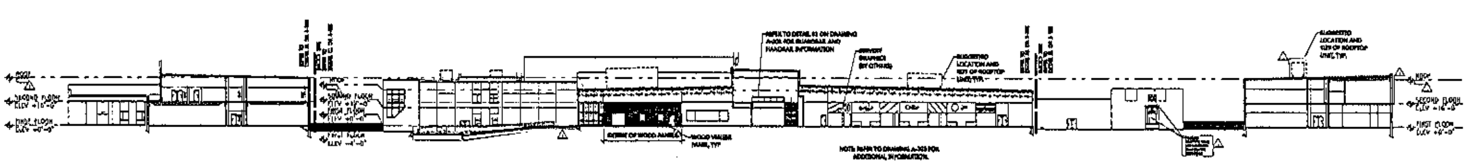


(C1) BUILDING SECTION H-H'
SCALE: 1/16" = 1'-0"





(B1) BUILDING SECTION I-I'
SCALE: 1/32" = 1'-0"



(A1) BUILDING SECTION J-J'
SCALE: 1/32" = 1'-0"

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE: AS NOTED
DATE: SEPTEMBER 29, 2016

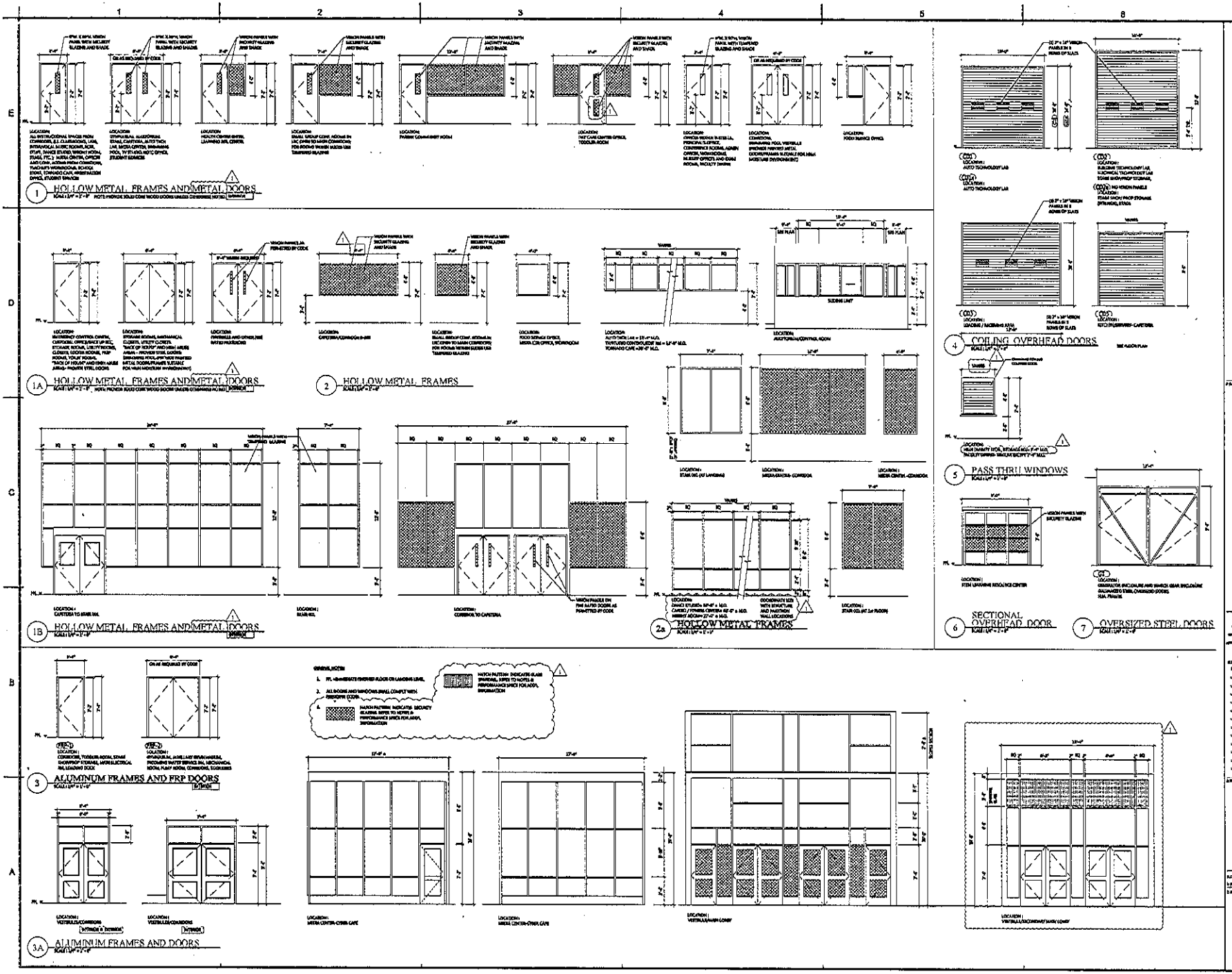
REVISIONS

DRAWING TITLE

BUILDING SECTIONS

DRAWING

A-302



STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE: AS NOTED
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE: SEPTEMBER 29, 2015

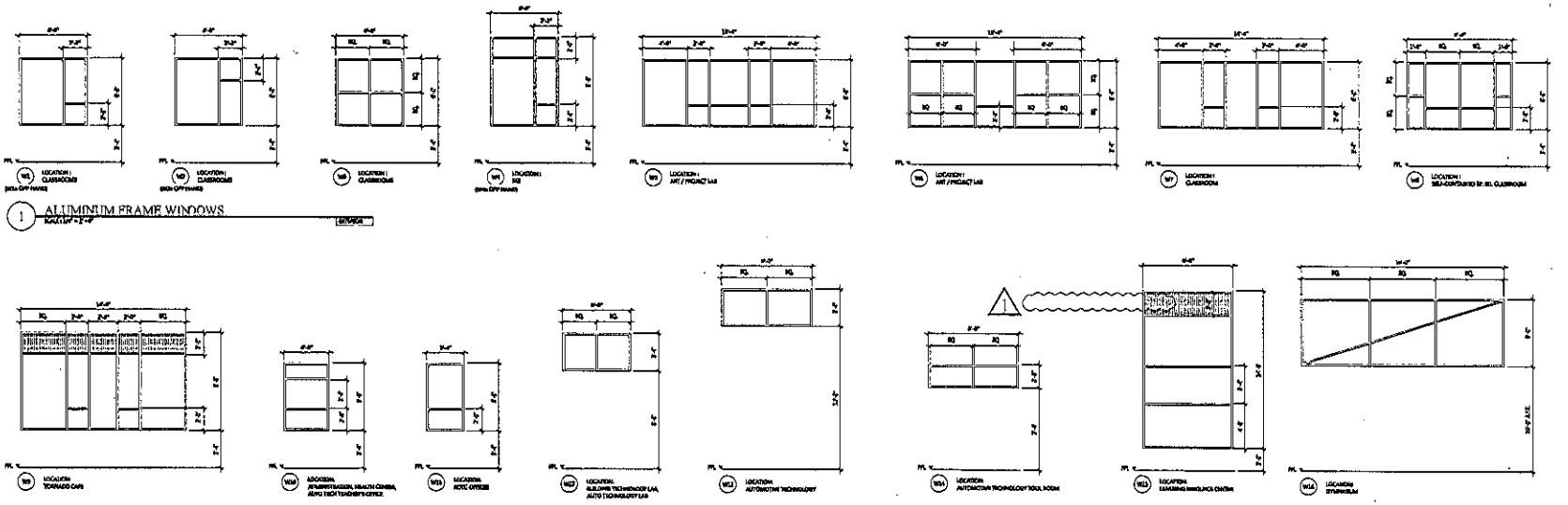
REVISIONS

SYMBOL	DATE	DESCRIPTION
1	12/16/15	ADDENDUM 1

DRAWING TITLE
DOOR AND WINDOW ELEVATIONS

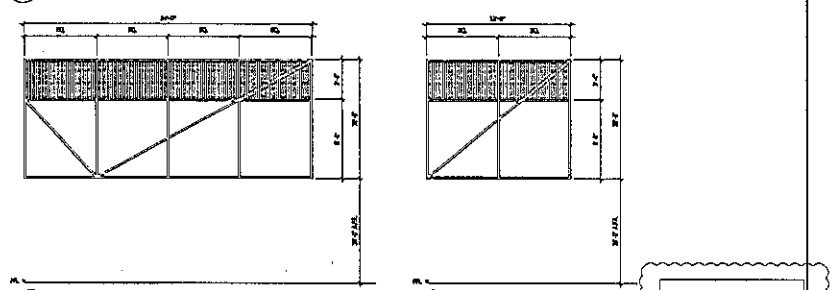
S.D.A. PROJECT # 5210-060-13-1009
T.S.D. PROJECT # 5210-060-13-1000
DRAWING #

A-601

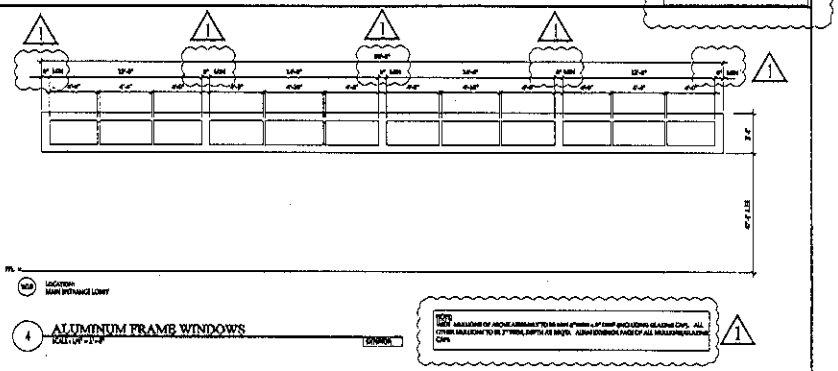


1 ALUMINUM FRAME WINDOWS

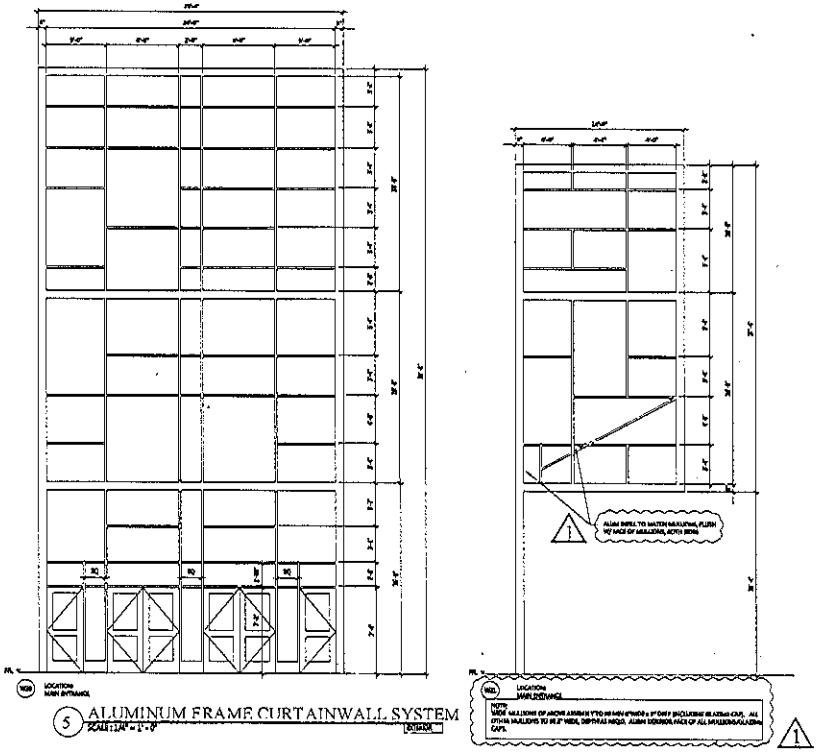
2 ALUMINUM FRAME WINDOWS



3 ALUMINUM FRAME WINDOWS



4 ALUMINUM FRAME WINDOWS



5 ALUMINUM FRAME CURTAINWALL SYSTEM

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

AS NOTED

DATE: SEPTEMBER 29, 2015

REVISIONS

SYMBOL	DATE	DESCRIPTION
1	MARCH	ADDENDUM #1

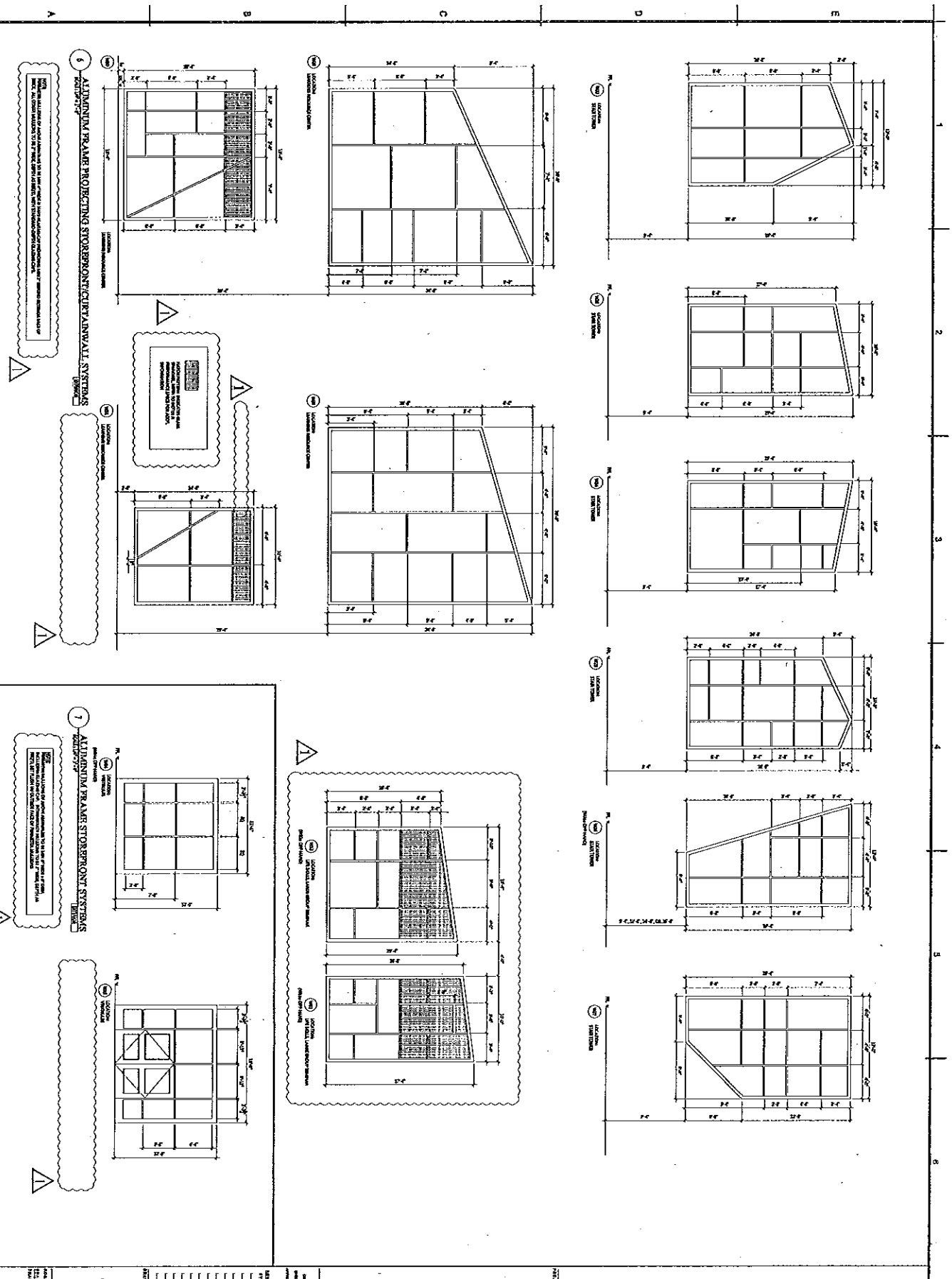
DRAWING TITLE

WINDOW, STOREFRONT, AND CURTAINWALL ELEVATIONS

SDA PROJECT # 3210-050-13-1002
DCA PROJECT # 3210-050-13-1002

DRAWING #

A-602

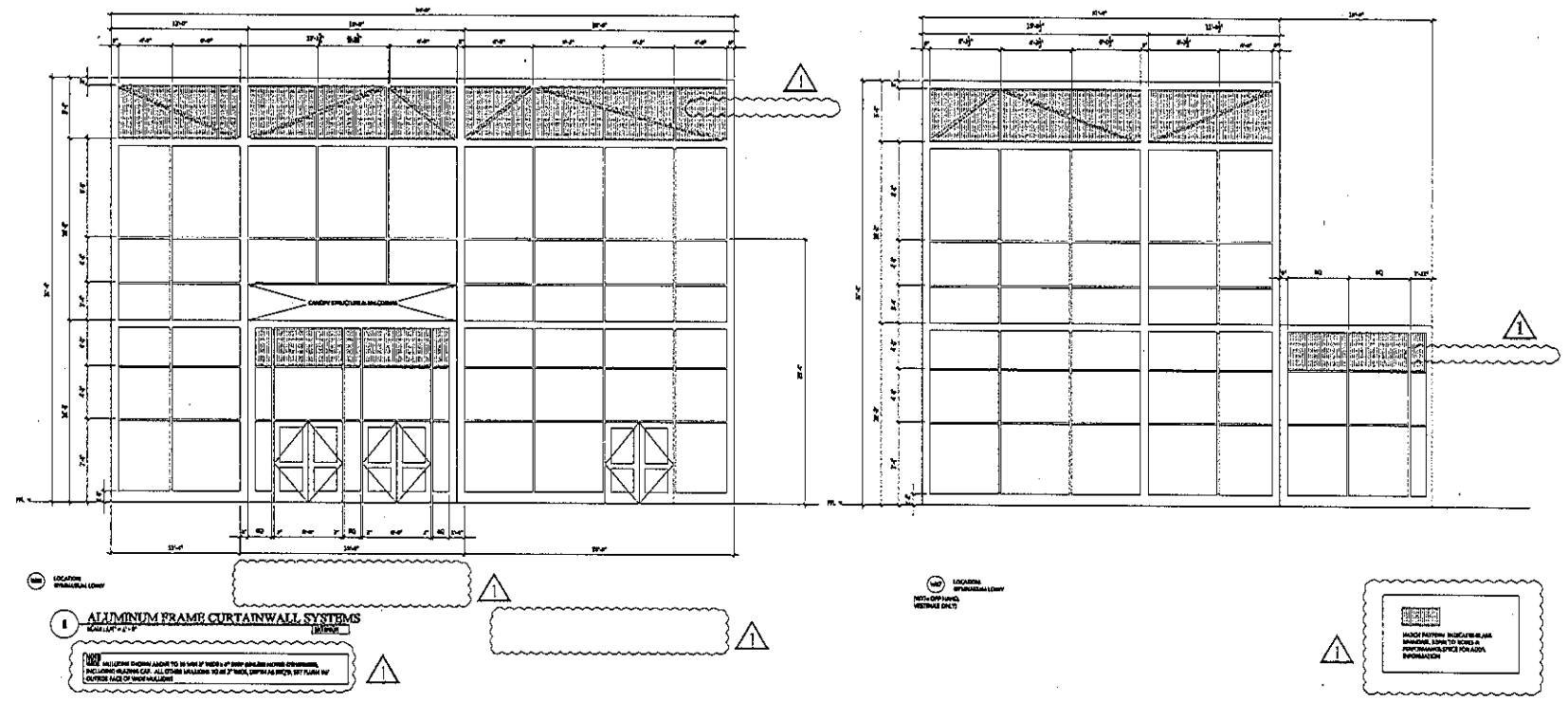


NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

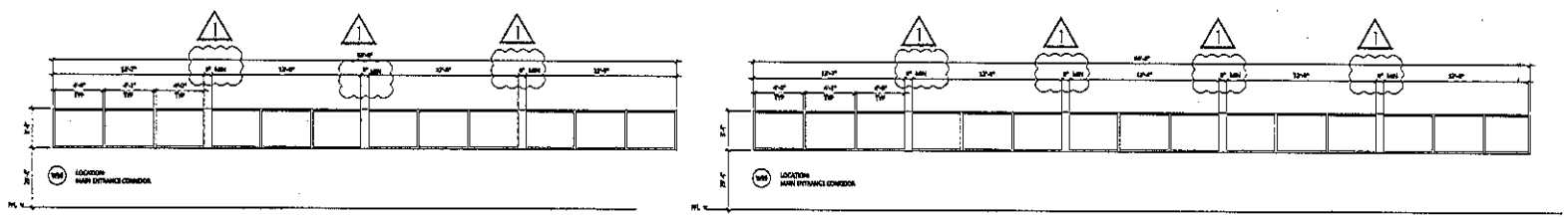
STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

STOREFRONT AND CURTAINWALL ELEVATIONS

A-603



1 ALUMINUM FRAME CURTAINWALL SYSTEMS



9 ALUMINUM FRAME STOREFRONT (CLERESTORY) SYSTEMS

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE

NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE AS NOTED
DRAWN BY
CHECKED BY
APPROVED BY
DATE SEPTEMBER 20, 2018

REVISIONS

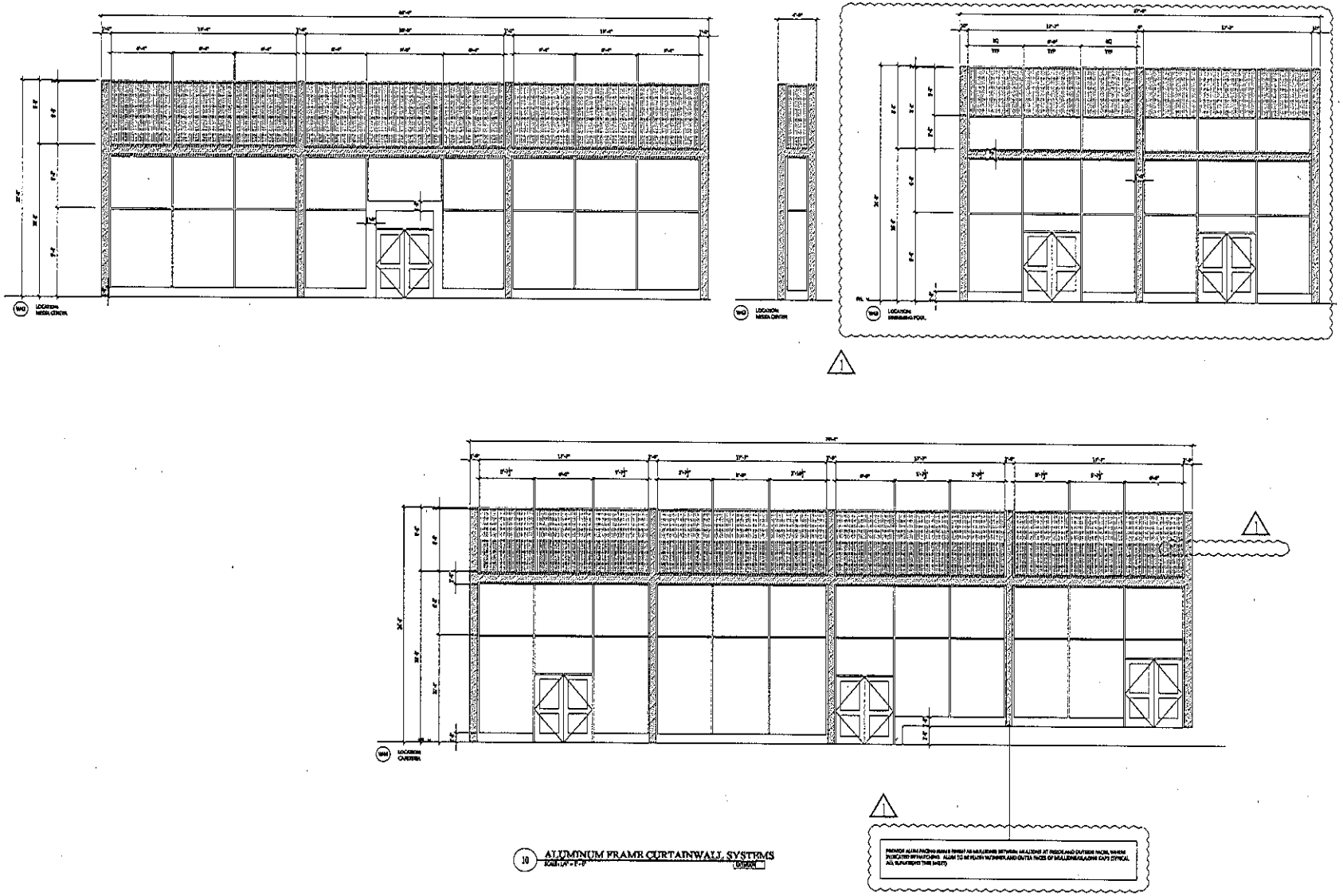
SYMBOL	DATE	DESCRIPTION
1	MM/DD/18	ADDENDUM # 1

DRAWING TITLE

STOREFRONT
AND
CURTAINWALL
ELEVATIONS

A/E PROJECT # 3210-060-13-1000
SDA PROJECT # 3210-060-13-1000
DRAWING #

A-604



10 ALUMINUM FRAME CURTAINWALL SYSTEMS
SCALE: 1/8" = 1'-0"

STATE OF NEW JERSEY
SCHOOLS DEVELOPMENT AUTHORITY
32 EAST FRONT STREET, TRENTON, NEW JERSEY 08625

PROJECT TITLE
NEW
TRENTON CENTRAL HIGH SCHOOL
FOR
TRENTON SCHOOL DISTRICT
TRENTON, NEW JERSEY

SCALE: AS NOTED
DRAWN BY:
DESIGNED BY:
APPROVED BY:
DATE: SEPTEMBER 29, 2016

REVISIONS

SYMBOL	DATE	DESCRIPTION
1	MARCH 3, 2017	ADDENDUM #3

DRAWING TITLE
CURTAINWALL ELEVATIONS

SDA PROJECT # 6210-060-13-1000
TDA PROJECT # 6210-060-13-1000
DRAWING #

A-605