

Addendum No. 3

DATE: August 26, 2009

PROJECT #: Marshall Street Elementary School
Paterson, NJ
SDA Contract #PA-0006-C03

The following revisions to the Bid Documents by Addendum #3 are:

A. CHANGES TO THE FRONT-END:

1. Section 01010-4, Summary of Work, Allowances:

DELETE Allowance #2: \$150,000 for phone system. Telephone specifications are provided herein. The telephone system is now part of the lump sum bid.

ADD new Allowance #2: \$20,000 for PSE&G fees and costs that may be billed to general contractor for electric and gas service / relocations.

B. CHANGES TO THE SPECIFICATIONS:

1. DELETE Specification Section 08200 Wood Doors.

2. ADD to Specification Section 12320 Pre-Manufactured Plastic Laminate Casework the following additional manufacturer: DS&D (Dancker, Sellew & Douglas).

3. CHANGE Specification Section 10350 Flagpoles, Part 1.2 – A.1, specified flagpole height from 35'-0" reduced to 25'-0".

4. CHANGE Specification Section 11400, Item 36 - Refrigeration System for Walk-In Cooler:

a. Condensing Unit, Item 38 – change model number to Coldzone ORE- H100M44-27, 1 HP (208/3 Phase). Refrigerant to be R-404A.

b. Evaporator Coil, Item 37 – change model number to Coldzone AA28-112B (115volt).

5. CHANGE Specification Section 11400, Item 41 - Refrigeration System for Walk-In Freezer, Item 41:

a. Condensing Unit, Item 43 – change model number to Coldzone ORE- H315L44-2T, 3HP (208/3 Phase). Refrigerant to be R-404A.

b. Evaporator Coil with Electric Defrost, Item 42 – change model number to Coldzone AE36-120B (208/1 Phase).

(Manufacturer has changed model numbers and is now using R-404A refrigerant.)

6. CHANGE Specification Section 11400, Item 61 – Warming Cabinet, Mobile, Uninsulated – change model number to Intermetro C569-NFS-U with solid door.
7. REPLACE Specification Section 04221 Concrete Masonry Units with the enclosed Specification Section 04221 dated 8/27/09, 5 pages.
8. REPLACE Specification Section 04810 Unit Masonry Assemblies with the enclosed Specification Section 04810 dated 8/27/09, 11 pages.
9. REPLACE Specification Section 05810 Expansion Joint Cover Assemblies with the enclosed Specification Section 05810, 4 pages.
10. REPLACE Specification Section 09260 Gypsum Board Assemblies with the enclosed Specification Section 09260, 7 pages.
11. ADD Specification Section 17000 Project Overview, attached, 4 pages, previously missing from bid set.
12. ADD Specification Section 17300 IP Voice Communications, attached, 3 pages.
13. ADD Specification Section 17310 IP Voice Communications, Switching and Routing Equipment, attached, 11 pages.
14. ADD Specification Section 17320 IP Voice Communications Station Equipment, attached, 3 pages.
15. DELETE Specification Section 06400. Use Specification Section 12320 for both plastic laminate and epoxy countertops. Science Demo Rooms, Life Skills, Teacher Demo and Prep Room counters to be epoxy resin. Art Room Demo table to be epoxy resin.
16. INSERT at end of Specification Section 10420 Plaques, the enclosed sketch of a typical plaque layout. Typically, the plaque is 24" wide by 20' high.

C. CHANGES TO THE DRAWINGS

1. Refer to plumbing drawings for locations of safety stations in lieu of locations shown on Detail 1 on Dwg. A-9.1 and 1/A-9.1
2. Wall section 31 on Dwg. A-4.8 reference note #16 change to note #36.
3. General note #4 shall be changed to read "All below grade roof leaders will be 4" PVC and have a minimum cover of 24" below proposed grade, unless specific pipe size and inverts are shown on plan".
4. Glazed face concrete masonry units (glass block) shall not be required to be fire rated.
5. Drawing BR-3, details C & D, delete "see Civil drawings for fence ht. and details". Replace with "see drawings PB-1 through PB-8".

6. Drawing A-10.0, delete reference to (4) fan fiberglass backboards electronically operated. These backboards are manually operated.
7. DELETE all references to exterior wall materials indicated on floor plans or enlarged plan details. Refer to elevations for exterior wall materials.
8. Drawing R-1 (Addendum #1): Add Note #2 on right side of drawing: System riser stack locations to be coordinated with locations of radon vent piping as shown on plumbing drawings P2 to P12.
9. Elevation Dwgs. A-3.0 through A-5.0 – Keyed Elevation Notes, delete note 6.
10. Drawing A-2.1: delete all notes referencing 3'-4" dia. Mechanical louver. Replace with 3'-0" dia. Mechanical louver.
11. Drawing A-2.0 – Roof Plan: Detail reference R2/A2.2 to be changed to R4/A2.2.
12. Drawing A-1.5 – First Floor Plan: Plan Detail 1 add note "grind edge of CMU smooth at corner. Plan Detail 2 change reference note "solid plastic stool" to "wood clear poplar window sill and trim – painted".
13. Drawing A-1.4, Detail 1 change reference note "epoxy enclosure cap (black) wood blocking as required" to "plastic laminate clad plywood enclosure cap".
14. Drawing A-1.4 - Central & South Wing First Floor Plan: Detail 6, delete model numbers from column from Display & Trophy Case Schedule.
15. Drawing A-1.0 – Basement Plan & Details: Details 3, 7 & 8, delete reference note "Building vapor barrier over 5/8" fiberglass faced mold & moisture resistant gypsum board sheathing" and replace with "Building wrap vapor barrier over 5/8" fiberglass faced mold & moisture resistant gypsum board sheathing". Detail 1, delete note "ext. gyp. sheathing" and replace with "building wrap vapor barrier.....".
16. ADD Sketch SKA-1: see sketch for typical classroom elevation revisions on Dwg. A-1.2.
17. ADD Sketch SKA-2: see sketch for revised head detail 4 on Dwg. A-1.3.
18. ADD Sketch SKA-3: see sketch for revised sill detail 5 on Dwg. A-1.3.
19. ADD Sketch SKA-4: see sketch for revised plan details 4 & 5 on Dwg. A-1.3.
20. ADD Sketch SKA-5: see sketch for revised details A & B on Dwg. A-06 identifying play structure ground details.
20. REPLACE the original bid set drawing A-2.0 dated 7/6/09 with the enclosed drawing A-2.0 dated 8/24/09. Modifications are clouded.
21. REPLACE the original bid set drawing A-2.1 dated 7/6/09 with the enclosed drawing A-2.1 dated 8/24/09. Modifications are clouded.
22. REPLACE the original bid set drawing A-2.2 dated 7/6/09 with the enclosed drawing A-2.2 dated 8/24/09. Modification is clouded.

23. REPLACE the original bid set drawing A-6.1 dated 7/6/09 with the enclosed drawing A-6.1 dated 8/24/09. Modifications are clouded.
24. REPLACE the original bid set drawing A-6.2 dated 7/6/09 with the enclosed drawing A-6.2 dated 8/24/09. Modifications are clouded.
25. REPLACE the original bid set drawing A-8.0 dated 7/6/09 with the enclosed drawing A-8.0 dated 8/24/09. Extensive changes, no revision clouding provided.
26. REPLACE the original bid set drawing A-8.1 dated 7/6/09 with the enclosed drawing A-8.1 dated 8/24/09. Extensive changes, no revision clouding provided.
27. REPLACE the original bid set drawing A-10.0 dated 7/6/09 with the enclosed drawing A-10.0 dated 8/24/09. Modification is clouded.
28. REPLACE the original bid set drawing A-10.1 dated 7/6/09 with the enclosed drawing A-10.1 dated 8/24/09. Extensive changes, no revision clouding provided.
29. REPLACE the original bid set drawing A-10.2 dated 7/6/09 with the enclosed drawing A-10.2 dated 8/24/09. Extensive changes, no revision clouding provided.
30. REPLACE the original bid set drawing A-10.5 dated 7/6/09 with the enclosed drawing A-10.5 dated 8/24/09. Floor and base finishes and patterns were modified. Floor changed from VCT to quarry tile. Base change to quarry tile.
31. REPLACE the original bid set drawing T-203 dated 7/6/09 with the enclosed drawing T-203 dated 8/27/09. This drawing has been revised to include the scope of work for an IP Voice Communications System and Equipment.
32. REPLACE the original bid set drawing T-206 dated 7/6/09 with the enclosed drawing T-206 dated 8/27/09. This drawing has been revised to include the scope of work for an IP Voice Communications System and Equipment.
33. REPLACE the original bid Dwgs. PB-1 through PB-8 (Pedestrian Bridge dated 5/15/09) with the enclosed Dwgs. PB-1 through PB-8 dated 7/06/09.
34. Casework clarifications:
 - Dwg. A-9.1 - Item # 9 – in all Science Rooms, computer stations to be provided by NJSDA, not GC.
Item #10 – Student Table #2083 MOD by NJSDA, Item #1 by GC
EL 16 – c-top material is epoxy resin, see Spec. Sec. 12320.
EL 2 – Item #12 – Change all cabinets identified as Model #B262 to #5262.
EL 6 – Item #13 identified as #0561 is a protective glass cabinet @ 1 per science room.
 - Art Room - Item #3 by NJSDA
 - Classrooms- EL 8 – All bookshelves indicated on the casework plans shall be provided by the GC unless otherwise noted.
Item #5 – storage cabinet to be LSI Model #5063.
 - Facilitator & Guidance – Items #4 & 5
Bookshelves indicated in Facilitator, Guidance Rooms, Media Center and Tech Coordinator Office shall be provided by NJSDA.

Teacher Planning – Item #1 – all items are provided by NJSDA.

Dwg. A-9.6 - Section L – countertop shall be 1” epoxy resin per Spec. Section 12320.

Section E – omit section E/A-9.6. Reception desk shall be provided by NJSDA.

35. Drawing C-5 clarification: Existing information shown regarding the existing 6” DIP water line is shown on the drawing. No additional information is available at this time. The contractor shall perform investigation work to determine the existing pipe material and rim invert elevation at his own expense. Refer to note #24 on sheet C-1.

36. Drawing C-15 clarification: The plan details for the north wall and profile section identify an 8” PVC pipe. This information supercedes drawing C-5.

37. For Drawings A-3.0 through A-3.5, add the following manufacturer’s selections as a basis of design for masonry:

<u>Keyed Elevation</u>	<u>Manufacturer</u>	<u>Type</u>	<u>Color</u>
4.1	E. Dillon	Reflective Face	Desert Castle
4.2	E. Dillon	Split Face	Silver Sand
4.3	E. Dillon	Reflective Face	Silver Sand
4.5	Premier	Glazed	Light Olive Green
4.6-4.9	Glen Gery	Modular Wirecut	W77-DBC

D. CLARIFICATIONS

1.

Q: Drawing A-1.5 indicates “Dock Leveler” at Kitchen S109 door S109D. There is not a specification for a Dock Leveler nor does it show on Section 46/A-4.10. Please clarify, and if a dock leveler is required, provide the proper detail and specification.

A: There is no dock leveler

2.

Q: Overhead Coiling Doors – Specification Section 08333 is for an electric motorized overhead door; however A-4.10 Section 46 indicates manual overhead door and 1st Floor Power Plan Drawing EP-5 does not show circuitry to this door. Please clarify.

A: Overhead Coiling Door is manually operated.

3.

Q: Request for substitution from EverGuard Roofing.

A: This roofing system does not comply with the specifications as an equal product.

4.

Q: Request for manufacturer prequalification by Newline Products for Section 10100 Visual Display Boards.

A: Newline Products, Inc. is an acceptable manufacturer to provide products as specified in Section 10100 Visual Display Boards.

5.

Q: The specs include sections 08200 – Wood Doors and 08212 – Flush Wood Doors. Which are we to use?

A: Use specification 08212 Flush Wood Doors

6.
Q: What is the vision panel specified for Room S109-5 on Dwg. A-1.5?
A: See hollow metal frame Type '4'.
7.
Q: Details for Aluminum Frames types "AL-2", "AL-5", "AL-6", and "AL-7" show four (4) leaves per frame. The schedule calls for only two (2). Please clarify.
A: Four (4) leaves per frame as shown on elevation.
8.
Q: Is the Owner providing the services of an environmental consultant as recommended by the NJDEP?
A: Yes
9.
Q: Pedestrian Bridge specification section 13130 Part II paragraph C indicates the interior clear width of the bridge shall be 16'-0" +/- when measure from the outermost rails. This seems to conflict with Section A/BR-1. Please review and clarify.
A: The 16'-0" dimension is to the outermost edge of the trusses as shown on detail A/BR-1.
10.
Q: Pedestrian Bridge specification section 13130 Part II paragraph D ii indicates the bridge shall be pre-assembled and not fabricated in more than 2 sections. This would result in sizes either 16'x 51.5' or 8' x 103'. Neither size will allow for shipping across country. 16' will take up 2 lanes of traffic. Specified manufacturer's are 1000's of miles away. At a minimum the bridge would need to be fabricated in 4 sections each approx. 8' x 51.5'.
A: The manufacturer may use its own discretion as to how the bridge is pre-assembled and shipped to the site.
11.
Q: Would the Engineer except a Value Engineer aluminum bridge option?
A: An aluminum bridge does not meet the requirements of the specified steel bridge, therefore, as aluminum bridge cannot be accepted as an equal product.
12.
Q: Spec. Section 02960 and the Civil ("C") drawings indicate aluminum railings on the exterior of the building. Spec. Section 05520 indicates galvanized steel for exterior railings. Details 6 & 7/A-0.6 show steel fr exterior railings. Please review and advise what product we are to base our bid on.
A: All exterior railings to be galvanized steel per Spec. Section 05520 Handrails and Railings.
13.
Q: As discussed at the pre-bid meeting, please confirm that the GC need not hire a LEED Consultant as a requirement for the contract.
A: That is correct, however, the GC is expected to follow all specifications and provide information and data on the forms provided.
14.
Q: Please advise if a full-time (non-working hours) Watchman is required for this project. If so, please confirm that those hours that a Watchman is required to substantial completion or final completion.
A: Refer to General Conditions (GC), Article 6.17 Security, Paragraph 6.17.2. Watchman is required until Substantial Completion.
15.
Q: Please advise what the cost of the NJ Transit Temporary Access Permit will be.
A: Refer to the Temp. Access Permit Sample included in the bid package. Permit cost is \$500 as of 1/30/09.

16.
Q: Per page 40 of the NJSDA Safety Manual, Item L-3, will the CM/PMF demand that scaffolding be designed, inspected and approved by a PE?
A: Yes
17.
Q: Who is responsible for Railroad Protection Insurance?
A: General Contractor
18.
Q: In regards to the SDA web-based Primavera Expedition and P5 management tool, who will assign the username and password to the General Contractor?
A: The NJSDA will assign the username and password after the General Contractor's personnel have attended a one-day training session.
19.
Q: Drawing A-6.1 calls for Raised Access Floor in Room S-107-1. On A-1.5 this room has a section 48/A-4-7 called out. Please provide this missing section.
A: The section is clearly on Dwg. A-4-7, Section 48. It is on the lower left side of the sheet. Also refer to Specification Section 10270 – Access Flooring.
20.
Q: We have Spec. Section 12490 – Window Treatment. Provide information and details where they are to go and what the extent of the work is.
A: All "W" type windows are to be provided with horizontal louver blinds per Spec. Section 12490.
21.
Q: Please provide drawings showing the scope of work for Spec. Section 11060 Auditorium Rigging & Draperies.
A: Refer to Sketches AL-1.0 and AL-2.0, attached 11" x 17", to coordinate with Spec. Section 11060.
22.
Q: Please clarify finish discrepancies between the Finish Schedule and the Drawings.
A: Refer to the updated A-6.1 Finish Schedule, attached.
23.
Q: On Drawing A-06, what does the symbol "7" mean?
A: Replace symbol "7" on Dwg. A-06 with the symbol 3/A-06 "Site Sign Plan & Elevation"
24.
Q: Drawing C-4 shows basement finish floor as 139.67, whereas, Drawing S-1A shows it as 141. Please clarify. Also, provide details of the following wall footings/locations:
- Column line 1.4 between column lines C.2 and D.
- Column line 5.2 between column lines D and E.
- Column line 7.4 between column lines D and E.
- Column line H.1 between column lines 6.5 and 8.1
A: Elevation at basement floor is 141.00.
Refer to attached Sketches CEC 1 through 3.
25.
Q: Drawing A-1.4 shows epoxy enclosure caps at the columns. Please provide spec and information. Drawing A-6.1 indicates a few rooms to have millwork. Is this list for bookshelves?
A: Enclosure caps have been revised to plastic laminate, as shown on Detail 1/A-1.4. For millwork, refer to Drawings A-9.0 to A-9.6 for list of responsibilities for inclusion of millwork requirements.

26.

Q: Please clarify the fire-rating(s) required for glass block.

A: Fire-rated glass block is not required for this project.

27.

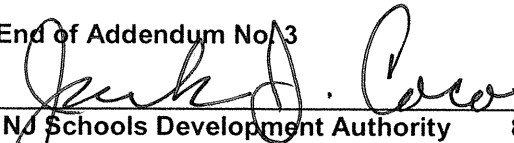
Q: Refer to Spec Section 07141, 1.8 Warranty, paragraph B notes "choose one". Please complete your selection.

A: Provide 10-year Manufacturer's Material Warranty.

Provide 15-year Manufacturer's Watertightness Warranty.

This addendum shall be considered part of the Bid Documents issued in connection with the referenced project. Should information conflict with the Bid Documents, this Addendum shall supersede the relevant information in the Bid Documents.

End of Addendum No. 3



NJ Schools Development Authority

8/26/09

Jack Coco, Project Manager

Addendum No. 3

DATE: August 26, 2009

PROJECT #: Marshall Street Elementary School
Paterson, NJ
Contract #PA-0006-C03

Acknowledgement of Receipt of Addendum

Contractor must acknowledge the receipt of the Addendum by signing in the space provided below and returning via fax to 609-951-0038. Signed acknowledgement must be received prior to the Bid Due Date. Acknowledgement of the Addendum must be made in Section E.6 of the Price Proposal Submission.

Signature

Print Name

Company Name

Date

SECTION 04221 - CONCRETE MASONRY UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Concrete masonry units with a reflective/ground and split face texture.
- B. Related sections:
 - 1. Section 07210 - Building Insulation
 - 2. Section 07620 – Sheet Metal Flashing and Trim
 - 3. Section 04810 - Unit Masonry Assemblies: Construction of masonry walls using polished face masonry units specified in this Section.

1.2 REFERENCES

- A. America Society for Testing and Materials:
 - 1. ASTM C25 - Chemical Analysis of Limestone, Quicklime, and Hydrated Lime.
 - 2. ASTM C33 - Concrete Aggregates.
 - 3. ASTM C67 - Sampling and Testing Brick and Structural Clay Tile.
 - 4. ASTM C88 - Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - 5. ASTM C90 - Load-Bearing Concrete Masonry Units.
 - 6. ASTM C127 - Specific Gravity and Absorption of Coarse Aggregates.
 - 7. ASTM C744 - Prefaced Concrete and Calcium Silicate Masonry Units.
 - 8. ASTM C1372 - Segmented Retaining Wall Units.

1.3 SUBMITTALS

- A. Provide in accordance with Section 01300 - Submittal Procedures:
 - 1. Product data for CMU types indicating composition, shape, surfaces, and dimensions.
 - 2. Copies of test reports and certificates showing compliance with Paragraph 2.2.A and Paragraph 2.3.
 - 3. Samples of Reflective face CMU illustrating color range, gloss of reflective surface, and texture.

4. Installation instructions.

1.4 MOCK-UP

- A. In accordance with Section 04810 – Mock-Up, prepare mock-up of Dillon reflective face CMU wall illustrating color, finish, texture, and joints and to establish standard of quality for completed work.
- B. Mock-up shall be built to match architects design illustrating reflective face CMU and mortar combination, coursing, and pattern. Mock-up shall be constructed with:
 1. Reflective face, Split Face and Ground Face CMU by Dillon as specified in this Section and material sizes reflected on architects design.
 2. Mortar, grout, and reinforcement specified in Section 04810 - Unit Masonry Assemblies.
- C. Size: Approximately 4 feet high by 6 feet long.
- D. Provide slab or foundation support as required by size of mock-up.
- E. Retain mock-up during construction as quality standard. Completely remove when work is accepted.
- F. Clean Mock-up prior to approval using same products and procedure recommended by manufacturer
- G. Apply Anti Graffiti coating after cleaning is complete and mock up has dried for several days. During application, follow all instructions provided by manufacturer of Anti Graffiti sealer.

1.5 HANDLING

- A. Deliver, store, and handle masonry units in manner to avoid chipping, breakage, marring reflective faces, and contact with contaminating materials.
- B. Deliver on wood pallets with foam layers to protect reflective faces. Prior to shipping cover block cubes with shrink wrap or shrink bags.
- C. Site store in protected area and covered to ensure units remain dry and clean. Do not allow units to sit in standing water.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Basis of Design - E. Dillon supplied by Diener Brick Company (856-858 -2000)

Alternates:

- A. York Building Products – Color to match Basis of Design

- B. Nitterhouse Concrete Products – Color match architects approved sample
- C. Manufacturers of equivalent products submitted and approved in accordance with Section 01600 – Products and Substitutions. Architect reserves right to reject substitution request based on aggregate, color, reflective surface, and gloss, even though structural characteristic, shapes, and materials are equivalent.

2.2 MATERIALS

- A. Aggregate: High-grade dolomitic limestone complying to ASTM C33 and the following additional requirements:
 - 1. Maximum silica content: 2 percent tested in accordance with ASTM C25.
 - 2. Freeze-thaw resistance: 10 percent weight loss after 5 cycles tested in accordance with ASTM C88.
 - 3. Maximum water absorption: 1.3 percent tested in accordance with ASTM C127.
- B. Water repellent: Liquid integral polymeric admixture.
- C. Sealer: Anti Graffiti Sealer to be post applied after installation.
 - 1. Apply proper coating from one of the three recommended companies listed below. Apply sealant/coating to all required units and joints as per manufacturer's instructions and approved sample on mock-up panel. Provide all warranties provided by the manufacturer at time of submittal.
 - a. Prosoco Use Defacer Eraser® Sacrificial Coating SC-1
 - b. 333 Omegaseal by Deitrich Technologies
 - c. New Dimension – Graffiti Shield with One Coat primer and Grout Sealer
 - d. Approved equal – Must be tested on approved field panel prior to construction.

2.3 CONCRETE MASONRY UNITS

- A. Type: Hollow and solid, load bearing concrete masonry units with highly reflective face complying with ASTM C90, Grade N, Type I moisture controlled.
- B. Minimum compressive strength: 2,000 PSI for average net area.
- C. Water repellency: Units manufactured with integral water repellent.
- D. Freeze/thaw durability: No separation, spalling, cracking, or disintegration of facing when tested in accordance with ASTM C1372.
- E. Reflective face: Conform to ASTM C744 when tested for:
 - 1. Cracking resistance: No evidence of crazing, cracking, or spalling.
 - 2. Chemical resistance.

3. Abrasion resistant.
 4. Resistance to color change: No significant change in color, gloss, or texture after 500 hours of accelerated weatherometer testing.
- F. Color: Desert Castle manufactured by E. Dillon & Company. Achieved with mix of colored aggregates;
- G. Types:
1. Stretcher units: Hollow units with one finished front face.
 - a. Reflective Mirror Finish
 - b. Splitface Finish
 - c. Groundface
 2. Hollow corner units with one front face and one end face finished as per plans.
 3. Bond beam units: Hollow bond beam units with one finished front face with either solid bottom or knock-out webs. See plans for details.
 4. Solid units: Stretcher unit with one finished front face, 7 5/8" high by 15-5/8 inches high by 3-5/8 inches deep.
 5. Sill units: Solid units with vertical and sloped finished as per plans front face.
- H. Unit sizes: As indicated on Drawings and otherwise required to complete work.
1. Depths: Provide pricing as per plans
 2. Height: Provide pricing as per plans
 3. Length: 15-5/8 inches

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate provision of reflective face CMU with mortar specified in Section 04810 - Unit Masonry Assemblies to ensure:
1. Color compatibility between reflective face and integrally colored mortar.
 2. Water repellent admixture added to mortar matches water repellent used in manufacture of reflective face CMU.

3.2 INSTALLATION

- A. Install CMU as part of unit masonry work specified in Section 04810 - Unit Masonry Assemblies. Install, protect, and clean and in accordance with installation requirements of that Section, manufacturer's installation instructions, and the following additional requirements. Provide control joints, slip joints as per NCMA recommendations and manufacturers recommendation.
- B. Field cut reflective face CMU with power tools to provide straight true edges and avoid damage to finished faces. Do not install chipped or broken units.
- C. Exercise care that wet mortar is not splashed onto reflective face during installation. Excess or splashed mortar shall be cleaned from face with dry burlap wipe. Remove after mortar becomes hard enough not to smear but prior to mortar sets.
- D. During grouting, placement of foamed-in-place insulation and application of sealants, ensure that materials are not smeared onto reflective faces of CMU. Remove as recommended by manufacturer.

3.3 PROTECTION

- A. During erection: Cover top of walls with waterproof sheeting at end of each day. Cover partially completed walls when work is not in progress. Extend cover 24 inches minimum down both sides and hold securely in place.
- B. Protect face of walls, sills, and other projections from roof run-off, splashed water, mud, grout, and mortar.
- C. Spread sand or straw at base of walls to minimize dirt and clay splashing onto reflective CMU faces.
- D. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

3.4 CLEANING AND ANTI GRAFFITI COATING

- A. **CLEANING** - Clean soiled CMU surfaces only with non-etching type cleaning solution as recommended by manufacturer. Follow manufacturer's cleaning instructions. Maintain reflective surface and color. Do not power wash any masonry products.
- B. **ANTI GRAFFITI** – Apply proper coating from one of the three recommended companies listed below. Apply sealant/coating to all required units and joints as per manufacturer's instructions and approved sample on mock-up panel. Provide all warranties provided by the manufacturer at time of submittal.
 - 1. Prosoco **Use Defacer Eraser® Sacrificial Coating SC-1**
 - 2. 333 Omegaseal by Deitrich Technologies
 - 3. New Dimension – Graffiti Shield with One Coat primer and Grout Sealer

END OF SECTION 04221

SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Brick units.
 - 2. Concrete masonry units.
 - 3. Split face concrete masonry units.
 - 4. Ground face concrete masonry units.
 - 5. Reinforcement, anchorage, and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit data for each type of face brick and ground face masonry units, insulation for block, and wall ties and other accessories.
- B. Samples:
 - 1. Submit four samples of face brick units to illustrate color, texture, and extremes of color range.
 - 2. Submit four samples of ground face masonry units to illustrate color, texture, and extremes of color range.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with MSJC Code and MSJC Specification.
- B. Conform to applicable code requirements for fire rated masonry construction.

1.4 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.5 MOCK-UP

- A. Construct a cavity masonry wall into a panel sized 4 feet long by 8 feet high, which includes brick, ground face masonry, standard concrete masonry, mortar, control joint, accessories, structural backup, wall openings, flashings, metal coping, sealants, wall insulation, air barrier.
- B. Locate where directed.
- C. Mock-up may not remain as part of the Work.

1.6 PRE-INSTALLATION MEETING

- A. Convene minimum one week prior to commencing Work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site. Inspect for damage.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Hot and Cold Weather Requirements: Comply with applicable code requirements.

1.9 COORDINATION

- A. Coordinate the Work of this section with work of other related trades.

PART 2 PRODUCTS

2.1 BRICK UNITS

Basis of Design – Shade Marshall Brick as Supplied by Diener Brick Co.

- 1. Basis of Design – Glen Gery Brick

- A. Manufacturers:

- 1. Glen-Gery.
- 2. The Belden Brick Co.
- 3. Diener Brick.
- 4. Taylor Clay Products
- 5. Palmetto Brick
- 6. Or approved equal.

- B. Face Brick: ASTM C216, Type FBS, Grade SW; color as selected.

- C. Brick Size and Shape: Size as indicated on Drawings, or as selected by Architect if not indicated. Provide special units for 90 degree corners and other special units as indicated or required.

- D. Special Brick Shape: Shaped to profile indicated; surface texture on sides and ends.

2.2 STANDARD CONCRETE MASONRY UNITS

- A. Manufacturers:

- 1. Clayton The Belden Brick Co.
- 2. Anchor
- 3. Grace Construction Products

4. Or approved equal
- B. Hollow and Solid Load Bearing Concrete Masonry Units (CMU): ASTM C90; normal weight.
- C. Hollow and Solid Non-Load Bearing Concrete Masonry Units (CMU): ASTM C129; normal weight.
- D. Concrete Masonry Unit Size and Shape: Nominal modular face size of 8 x 16 inches, thickness indicated on Drawings. Provide special units for 90 degree corners, control joints, bond beams, bullnosed corners, and other shapes as indicated on Drawings.
- E. Concrete Brick Units: ASTM C55, of same Grade, Type, and Weight as block units.
- F. Concrete Brick Size and Shape: Nominal modular size as indicated. Provide special units for 90 degree corners, bond beams, bullnosed corners, and as indicated or required.

2.3 GROUND FACE CONCRETE MASONRY UNITS

- A. Manufacturers:
 1. Trenwyth Industries Inc.; Trendstone.
 2. Clayton
 3. E.P. Henry
 4. Or approved equal
- B. Ground Face Masonry Units: ASTM C90; 2 core normal weight; ground face with integral water repellent; integral colors as selected from manufacturer's standard range, Groups A, B, and C.
- C. Size and Shape: Nominal face dimension of 8 x 16 inches, thickness as indicated on Drawings. Provide special shapes with ground face on exposed faces for 90 degree corners.

2.4 MASONRY CORE INSULATION:

- A. Loose-Granular Fill Insulation: ASTM C549, Type II or IV, Grade 3, silicone treated perlite; as manufactured by member of Perlite Institute, Inc.

2.5 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
 1. DUR-O-WAL, Inc.
 2. Hohmann & Barnard Inc.
 3. Heckmann Building Products Inc.
 4. Masonry Reinforcing Corporation of America.
 5. Or approved equal.
- B. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A153 Class B-2 after fabrication, 9 gage side rods with 9 gage cross ties.
 1. DUR-O-WAL, Inc.; D/A 310 Truss.

2. Hohmann & Barnard Inc.; Lox-All 120 Truss-Mesh.
 3. Masonry Reinforcing Corporation of America; Truss Type Series 300.
 4. Or approved equal.
- C. Multiple Wythe Joint Reinforcement: Truss type steel wire with projecting eyes and adjustable pintle veneer anchor, pintle length to suit application; hot dip galvanized to ASTM A153 Class B-2 after fabrication, 9 gage side rods with 9 gage cross ties.
1. DUR-O-WAL, Inc.; Dur-O-Eye D/A 370.
 2. Hohmann & Barnard Inc.; All Truss #165.
 3. Heckman Building Products.
 4. Or approved equal.
- D. Reinforcing Steel: ASTM A615/A615M, 60 yield grade, deformed billet bars, galvanized finish.
- E. Column Anchors: Formed steel wire, 3/16 inch thick, channel slot tie with 16 gage continuous channel slot, hot dip galvanized to ASTM A153 B-2 finish; Dur-O-Wal 918-921 with D/A 904.
- F. Beam Anchors: Formed steel strap 1-1/2 inches wide, length to suit conditions, 1/8 inch thick, with flange hook and 1-1/2 inch bend to embed in masonry, hot dip galvanized to ASTM A153 B-2 finish.
- G. Beam and Column Anchors: 16 gage formed steel adjustable channel slot; formed trapezoidal steel wire anchor, 3/16 inch diameter legs with 12 gage clip to fit slot anchor, anchor length to suit application, hot dip galvanized to ASTM A153 B-2 finish.
1. DUR-O-WAL, Inc.; D/A 904 Channel Slot with D/A 918-922 Anchor.
 2. Hohmann & Barnard Inc.; 360-C Channel Slot with 363 Anchor.
 3. Heckmann Building Products Inc.; 133 Channel Slot with 129 Anchor.
 4. Or approved equal.
- H. Strap Anchors: Z or U bent steel shape, 3/16 inch thick, 1 inch wide x length to suit application, hot dip galvanized to ASTM A153 B-2 finish.
1. DUR-O-WAL, Inc.; 301 Series Anchors
 2. Hohmann & Barnard Inc.; 405 Anchor.
 3. Heckmann Building Products Inc.; 140 and 141 Anchors.
 4. Or approved equal.
- I. Joint Reinforcing with Wall Ties: Cold drawn steel wire conforming to ASTM A82, with smooth cross rods butt welded not more than 16 oc to deformed side rod; sized to accommodate type installation, hot dip galvanized to ASTM A153 B-2 finish.
1. Hohmann & Barnard Inc.; 235 Cavity Wall with Cavity Lader-Tri-Mesh.
- J. Wall Ties: 14 gage formed steel adjustable anchor; formed trapezoidal steel wire tie, 3/16 inch diameter legs, tie length to suit application, hot dip galvanized to ASTM A153 B-2 finish.
1. DUR-O-WAL, Inc.; D/A 210 anchor with D/A 700 Series Ties.
 2. Hohmann & Barnard Inc.; DW-10 anchor with Vee Wall Tie.

3. Heckmann Building Products Inc.; 315-D anchor with 316 Series Wire Tie.
4. Or approved equal.

K. Anchor Bolts: Headed, J-shaped or L-shaped.

L. Vertical Bar Positioners: Formed steel wire, 9 gage, mill galvanized finish.

1. DUR-O-WAL, Inc.; D/A 810 and D/A 811 Vertical Bar Positioners.
2. Hohman & Bernard Inc.; 376 and 377 Vertical Bar Positioners.
3. Heckmann Building Products Inc.; RB and RB-Twin Vertical Bar Positioners.
4. Masonry Reinforcing Corporation of America; 3401 and 3402 Rebar Positioners.
5. Or approved equal.

2.6 MORTAR AND GROUT

A. Mortar and Grout: As specified in Section 04065.

2.7 FLASHINGS

A. Plastic Flashings: Composite polyester film.

1. Dur-O-Wal Fiberweb 200.
2. Sandell Manufacturing Co., Inc.; Nuflex.
3. Hohmann & Barnard, Inc.; Flex-Flash.
4. Or approved equal.

B. Metal Flashings: 5 oz copper sheet bonded between two layers of fiberglass, produced by

1. York Mfg. Inc.; Copper Fabric Flashing.
2. AFCO Products Inc.; AFCO Copper Fabric.
3. Sandell Manufacturing Company; Copper Fabric.
4. Substitutions: In accordance with Contract Documents.
5. Or approved equal.

C. Flexible Flashing: Composite sheet 40 mils thick; 38 mils thick self adhesive rubberized asphalt bonded to 2 mils thick high density polyethylene film.

1. Grace Construction Products; Perm-A-Barrier.
2. Hohmann & Barnard, Inc.; Epra-Max.
3. Sandell Manufacturing Co., Inc.
4. Or approved equal.

D. Surface Conditioner: As recommended by flashing manufacturer.

E. Termination Mastic: As recommended by flashing manufacturer.

F. Primer: Grace Construction Products; Low VOC Bituthene Primer.

G. Sealant Cap: Minimum 0.024 inch thick stainless steel sealant cap formed to provide sealant bond surface at shelf and relief angles.

H. Lap Sealant: Butyl or Acrylic, type suitable for application, as specified in Section 07900.

2.8 ACCESSORIES

- A. Manufacturers:
 - 1. DUR-O-WAL, Inc.
 - 2. Hohmann & Barnard Inc.
 - 3. Heckmann Building Products Inc.
 - 4. Masonry Reinforcing Corporation of America.
 - 5. Williams Products Inc.
 - 6. Or approved equal.

- B. Concrete Masonry Preformed Control Joints: Rubber, with corner and tee accessories, fused joints.
 - 1. DUR-O-WAL, Inc.; Regular Rapid Control Joint.
 - 2. Hohmann & Barnard Inc.; RS Standard Rubber Control Joint
 - 3. Heckmann Building Products Inc.; 352 Control Joint Anchor.
 - 4. Masonry Reinforcing Corporation of America; Rubber Control Joint.
 - 5. Or approved equal.

- C. Brick Masonry Preformed Control Joints: Closed cell neoprene, thickness to match width of head joints, depth to suit wythe thickness.
 - 1. DUR-O-WAL, Inc.; D/A 2015.
 - 2. Hohmann & Barnard Inc.; #NS Closed Cell Neoprene Sponge.
 - 3. Williams Products Inc.; Neoprene Type NN1.
 - 4. Or approved equal.

- D. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; sizes to suit application by maximum lengths.

- E. Building Paper: ASTM D226, No. 15 asphalt saturated felt.

- F. Weeps: Molded polyvinyl chloride grilles; insect resistant.
 - 1. DUR-O-WAL, Inc.; D/A 1006 Cell Vent.
 - 2. Hohman & Bernard Inc.; #QV Quadrovent.
 - 3. Masonry Reinforcing Corporation of America; 3601 Cell Vent.
 - 4. Or approved equal.

- G. Cavity Vents: Molded polyvinyl chloride grilles; insect resistant.

- H. Cavity Drain Material: Open polyethylene mesh thickness required to fill cavity space, and shaped to ensure moisture drainage to cavity weeps.
 - 1. Advanced Building Products, Inc.; Mortar Break.
 - 2. CavClear; CavClear Masonry Mat.
 - 3. Mortar Net USA, Ltd.; Mortar Net.
 - 4. Polytite Manufacturing Corp.; Mortar Stop.
 - 5. Or approved equal.

- I. Cleaning Solution: Acidic, not harmful to masonry work or adjacent materials.
 - 1. Prosooco Inc.; Sure Klean Vana Trol masonry cleaner.
 - 2. Diedrich Technologies, Inc.; 202V Vana-Stop;

3. Charger Corporation; AC-3 Cleaner.
4. Or approved equal.

J. Water Repellent: Dry Block manufactured by Grace Construction Products or Rheomix.

2.9 SOURCE QUALITY CONTROL

- A. Test brick efflorescence in accordance with ASTM C67. Brick rated greater than “slightly effloresced” is not acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify items provided by other sections of work are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
 1. Bond: Running and stack, as indicated on Drawings.
 2. Coursing: One unit and one mortar joint to equal 8 inches.
 3. Mortar Joints: Concave.
- D. Coursing of Brick Units:
 1. Bond: Running and stack, with soldier courses and rowlocks as indicated on Drawings.
 2. Coursing: Three units and three mortar joints to equal 8 inches.
 3. Mortar Joints: Concave.
- E. Coursing of Ground Face Masonry Units:
 1. Bond: Running and stack, as indicated on Drawings.
 2. Coursing: One unit and one mortar joint to equal 8 inches.
 3. Mortar Joints: Concave.

- F. Placing and Bonding:
1. Lay solid masonry units in full bed of mortar, with full head joints.
 2. Lay hollow masonry units with face shell bedding on head and bed joints.
 3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 4. Remove excess mortar as work progresses.
 5. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
 6. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 7. Cut mortar joints flush where resilient base is scheduled, and where cavity insulation vapor barrier adhesive is applied.
 8. Isolate masonry from vertical structural framing members with a movement joint as indicated.
 9. Isolate top of non-loading masonry from horizontal structural framing members and slabs or decks with compressible joint filler. Refer to Section 07840 for fire rated joints at tops of walls.
- G. Weeps and Vents: Provide weeps and vents in outer wythe at 24 inches oc horizontally above through-wall flashing, above shelf angles and lintels, at bottom of walls, and elsewhere as indicated.
- H. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor barrier adhesive.
1. Install cavity drain material continuously at bottom of each cavity above through wall flashing.
- I. Joint Reinforcement and Anchorage - Single Wythe Masonry:
1. Install horizontal joint reinforcement 16 inches oc, unless indicated otherwise.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches both sides of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum 6 inches.
 5. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- J. Joint Reinforcement and Anchorage - Masonry Veneer:
1. Install horizontal joint reinforcement 16 inches oc, unless indicated otherwise.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches both sides of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum 6 inches.
 5. Attach wall ties to masonry backup horizontal joint reinforcement to bond veneer at maximum 16 inches oc vertically and 16 inches oc horizontally. Place wall ties at maximum 8 inches oc vertically within 8 inches of jamb of wall openings. Place wall ties at maximum 8 inches oc horizontally within 8 inches of head and sill of wall openings.
 6. Reinforce joint corners and intersections with strap anchors 16 inches oc.

- K. Joint Reinforcement and Anchorages - Cavity Wall Masonry:
1. Install horizontal joint reinforcement 16 inches oc, unless indicate otherwise.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches both sides of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum 6 inches.
 5. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- L. Reinforcement and Anchorages - Multiple Wythe Unit Masonry:
1. Install horizontal joint reinforcement 16 inches oc, unless indicated otherwise.
 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches both sides of opening.
 3. Place joint reinforcement continuous in first and second joint below top of walls.
 4. Lap joint reinforcement ends minimum 6 inches.
 5. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
 6. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- M. Masonry Flashings:
1. Install sealant caps above ledge and shelf angles and under flashing and turn down on outside face to form a drip.
 2. Extend flashings horizontally through outer wythe at foundation walls, under parapet caps, at bottom of walls, and elsewhere as indicated or required; turn down on outside face to form a drip.
 3. Turn flashing up minimum 8 inches and bed into mortar joint of masonry.
 4. Lap end joints minimum 6 inches and seal watertight.
 5. Turn flashing, fold, and seal at corners, bends, and interruptions. Form sealed end dams at flashing terminations.
 6. Extend flashing minimum 2 inches beyond face of wall for installation verification. Cut flashings flush with face of wall after verification.
 7. Seal joints below sealant caps in accordance with Section 07900.
- N. Grouted Components:
1. Reinforce grouted components as indicated on Drawings.
 2. Lap splices minimum 48 bar diameters unless otherwise required by code.
 3. Support and secure reinforcing bars from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. At bearing locations, fill masonry cores with grout for a minimum 12 inches both sides of opening.
- O. Reinforced Masonry:
1. Lay masonry units with core vertically aligned and cavities between wythes clear of mortar and unobstructed.
 2. Place reinforcement bars as indicated.
 3. Support and secure reinforcement from displacement.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. Place grout in accordance with MSJC Specification.

P. Control and Expansion Joints:

1. Install control joints at the following maximum spacings, unless otherwise indicated on Drawings:
 - a. Exterior Walls: 20 feet oc and within 24 inches on one side of each interior and exterior corner.
 - b. Interior Walls: 30 feet oc.
 - c. At changes in wall height.
2. Do not continue horizontal joint reinforcement through control and expansion joints.
3. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
4. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
5. Size control joint in accordance with Section 07900 for sealant performance.
6. Form expansion joint by omitting mortar and cutting unit to form an open space.

Q. Masonry Cell Insulation: Pour granular insulation into cavities as shown to fill void spaces completely. Maintain inspection ports to show the presence of insulation at the extremities of each pour area. Close the ports after complete coverage has been confirmed. Limit the fall of insulation to one story in height, but not to exceed 20 feet.

R. Built-In Work:

1. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, anchor bolts, plates, and other items to be built-in the work and furnished by other sections.
2. Install built-in items plumb and level.
3. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
4. Do not build in materials subject to deterioration.

S. Cutting and Fitting:

1. Cut and fit for chases, pipes, conduit, sleeves, grounds, and other items penetrating masonry construction. Coordinate with other sections of work to provide correct size, shape, and location.
2. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

- E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- H. Maximum Variation for Steel Reinforcement:
 - 1. Plus or minus 1/2 inch when distance from centerline of steel to opposite face of masonry is 8 inches or less.
 - 2. Plus or minus 1 inch when the distance is between 8 and 24 inches.
 - 3. Plus or minus 1 1/4 inch when the distance is greater than 24 inches.
 - 4. Plus or minus 2 inches from the location along the face of the wall.

3.5 FIELD QUALITY CONTROL

- A. Brick Units: Test each type in accordance with ASTM C67, 5 random units for each 50,000 units installed.
- B. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.6 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

END OF SECTION 04810

SECTION 05810 – EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Expansion joint assemblies for interior floor, wall and ceiling surfaces.
 - 2. Expanding foam seals for exterior expansion joints.
 - 3. Plaza deck expansion joints.

1.2 PERFORMANCE REQUIREMENTS

- A. Fire Rated joint Designs: Conform to assemblies listed with Underwriters Laboratories or Warnock Hersey for fire resistance ratings tested in accordance with ASTM E119; ratings as indicated on Drawings.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate joint and splice locations, miters, layout of the work, affected adjacent construction, and anchorage locations.
 - 2. Indicate required installed joint width for range of temperature conditions expected at time of installation.
- B. Product Data: Submit joint assembly profiles, profile dimensions, anchorage devices, fire rated joint design, available colors and finish.
- C. Samples: Submit two samples for each joint assembly 12 inch long, illustrating profile, dimension, color, and finish selected.
- D. Manufacturer's Certificate: Certify fire rated joints meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Submit rough-in sizes; provide templates for cast-in or placed frames or anchors; required tolerances for item placement.

1.4 PRE-INSTALLATION MEETING

- A. Convene minimum one week prior to commencing Work of this section.

1.5 FIELD MEASUREMENTS

- A. Verify that field measurements are as instructed by the manufacturer.

1.6 EXTRA MATERIALS

- A. Provide 50 ft of resilient joint filler and one set of special tools required for accessing and servicing components.

PART 2 PRODUCTS

2.1 INTERIOR FLOOR EXPANSION JOINT ASSEMBLIES

- A. Manufacturers:
 - 1. C/S Group; Twinline Model GFP-HD with Fire Barrier.
 - 2. Balco/Metalines.
 - 3. ConSpec Systems Inc.
 - 4. MM System Corporation.
 - 5. Or approved equal.
- B. Expansion Joint: Heavy duty cover, totally flush finish, dual gaskets with Shore A hardness of 65; multi-directional movement, capable of plus or minus 25 percent movement of joint width; finish as selected.
- C. Fire-Resistance Rating: Provide expansion control system and fire-barrier assembly with a rating not less than that of adjacent construction.

2.2 INTERIOR WALL AND CEILING EXPANSION JOINT ASSEMBLIES

- A. Manufacturers:
 - 1. C/S Group; Allway Model SFW/SFC.
 - 2. Balco/Metalines.
 - 3. MM System Corporation.
 - 4. Or approved equal.
- B. Expansion Joint: Seismic cover, flush finish, free floating center plate, dual gasket with Shore A hardness of 65; multi-directional movement, capable of plus or minus 25 percent movement of joint width; finish as selected.
- C. Fire-Resistance Rating: Provide expansion control system and fire-barrier assembly with a rating not less than that of adjacent construction.

2.3 EXTERIOR ROOF AND WALL EXPANSION JOINT ASSEMBLIES

- A. Manufacturers:
 - 1. MM System Corporation; Series RX-R and RX-W.
 - 2. C/S Group.
 - 3. Nystrom, Inc.
 - 4. Or approved equal.
- B. Expansion Joint: Full omni-movement, seismic and thermal movement capability; factory transitions and miters; frames sealed with continuous extruded PVC gasket and neoprene waterstop; Kynar finish, color as selected.
- C. Fire-Resistance Rating: Provide expansion control system and fire-barrier assembly with a rating not less than that of adjacent construction.

2.4 COMPONENTS

- A. Extruded Aluminum: ASTM B221, 6063-T5.
- B. Sheet and Plate Aluminum: ASTM B209, 6061-T6.
- C. Extruded Bronze: ASTM B455, 385 alloy.
- D. Resilient Filler: Manufacturer's standard material.
- E. Fire Barrier: Manufacturer's standard material capable of withstanding seismic movement without displacement or damage; tested as component of fire resistive joint.
- F. Threaded Fasteners: Manufacturer's standard fasteners of type suitable for application.
- G. Backing Paint: Zinc chromate finish.

2.5 FABRICATION

- A. Joint Covers: Aluminum frame construction; retainers with resilient elastomeric, vinyl, or neoprene filler strip; designed to permit minimum plus or minus 25 percent joint movement with full recovery.
- B. Back paint components in contact with cementitious materials.
- C. Galvanize embedded ferrous metal anchors and fastening devices.
- D. Shop assemble components and package with anchors and fittings.
- E. Provide joint components in single length wherever practical. Minimize site splicing.

2.6 FACTORY FINISHING

- A. Aluminum Finish:
 - 1. Floors: Mill finish.
 - 2. Walls and Ceilings: Clear anodized.
 - 3. Exterior Roof and Walls: Manufacturer's standard factory painted polymer based finish.
- B. Resilient Filler Exposed to View: Color as selected from manufacturer's full range.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joint preparation and affected dimensions are acceptable.

3.2 PREPARATION

- A. Provide anchoring devices for installation and embedding.
- B. Provide templates and rough-in measurements.

3.3 INSTALLATION

- A. Install expansion joint assemblies in strict accordance with manufacturer's instructions.
- B. Install fire rated joints in accordance with tested fire rated design. Maintain continuity of fire rating of adjacent building assemblies.
- C. Install joint cover assemblies to permit full design movement capacity. Install joints at width required for temperature conditions at time of installation to maintain nominal joint width.
- D. Align work plumb and level, flush with adjacent surfaces.
- E. Rigidly anchor to substrate to prevent misalignment.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit traffic over unprotected floor joint surfaces.
- B. Provide removable strippable coating to protect finish surface.

END OF SECTION 05810

SECTION 09260 – GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Metal stud wall framing.
 - 2. Metal channel ceiling framing.
 - 3. Direct suspension ceiling framing.
 - 4. Gypsum board and joint treatment.
 - 5. Acoustic insulation.

1.2 PERFORMANCE REQUIREMENTS

- A. Stud Selection: Select stud gage and yield strength so maximum unbraced span does not exceed heights permitted by SSMA with maximum deflection of 1/240 for 5 psf uniform load.
- B. Conform to applicable code for fire rated assemblies as detailed on Drawings.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate special details associated with insulation, fireproofing, acoustic seals, and seismic bracing.
- B. Product Data:
 - 1. Submit data on metal framing, gypsum board, joint tape and acoustic accessories.
 - 2. Indicate maximum unbraced height permitted for each stud gage and yield strength.
- C. LEED Submittals:
 - 1. Product Data for Credit MR 4.1: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
 - a. Include statement indicating costs for each product having recycled content.
 - 2. Product Data for Credit EQ 4.1: For adhesives used to laminate gypsum board panels to substrates, including printed statement of VOC content.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C840, GA-214, GA-216, and GA-600.
- B. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 PRE-INSTALLATION MEETING

- A. Convene minimum one week prior to commencing Work of this section.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Metal Framing Manufacturers:
 - 1. Dale//Incor.
 - 2. Dietrich Industries.
 - 3. Superior Steel Studs Inc.
 - 4. Marino/Ware.
 - 5. Or approved equal.
- B. Direct Suspension System Manufacturers:
 - 1. United States Gypsum Company.
 - 2. Chicago Metallic Corp.
 - 3. National Rolling Mills Co.
 - 4. Or approved equal.
- C. Gypsum Board and Joint Treatment Manufacturers:
 - 1. United States Gypsum Company.
 - 2. Gold Bond Building Products.
 - 3. Georgia Pacific.
 - 4. Or approved equal.
- D. Acoustic Insulation Manufacturers:
 - 1. United States Gypsum Company; Thermafiber Sound Attenuation Fire Blankets (SAFB).
 - 2. Owens Corning; Sound Attenuation Batts/MW or Sound Attenuation Batts.
 - 3. CertainTeed; CertaSound Sound Attenuation Batts.
 - 4. Manville; Sound Shield Sound control Batts.
 - 5. Or approved equal.

2.2 COMPONENTS

- A. Framing Materials:
 - 1. Studs and Tracks: ASTM C645; galvanized sheet steel, minimum 25 gage, size as indicated on Drawings, 'C' shape.
 - 2. Deep Leg Deflection Track: ASTM C 645 top runner with 2 inch deep flanges.
 - 3. Furring, Framing and Accessories: ASTM C645.
 - 4. Fasteners: ASTM C1002.
 - 5. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- B. Ceiling Channel Suspension System Framing:

1. Channels: Hot or cold rolled; G30 (for interior applications) or G90 (for exterior applications) hot dipped galvanized steel channel; minimum 1-1/2 inches size and minimum 0.475 lb/ft in accordance with ASTM C754.
 2. Fasteners: ASTM C646.
 3. Hanger Wire: ASTM A641 soft temper, Class 1 galvanized steel, minimum 8 gage.
 4. Hanger Rods: Mild steel rod, with zinc coating, minimum 7/32 inches diameter.
 5. Angle Hangers: Minimum 7/8 x 7/8 inches, 16 gage, ASTM A653 G90 galvanized steel formed angles with 5/16 inches diameter bolted connections.
 6. Anchorage Devices: Screws, clips, bolts, concrete inserts, and other devices of type and size to suit application; to rigidly secure materials in place. Size devices for 5x calculated load for concrete inserts and 3x calculated load for other devices.
- C. Direct Suspension System Framing:
1. Grid Suspension System: ASTM C635; manufacturer's standard zinc coated system of interlocking furring runners, furring tees, and accessories designed for concealed modular supporting network for gypsum board ceilings.
 2. Channels: Hot or cold rolled; G30 (for interior applications) or G90 (for exterior applications) hot dipped galvanized steel channel; minimum 1-1/2 inch size and minimum 0.475 lb/ft in accordance with ASTM C754.
 3. Hanger Wire: ASTM A641 soft temper, Class 1 galvanized steel, minimum 8 gage.
 4. Anchorage Devices: Screws, clips, bolts, concrete inserts, and other devices of type and size to suit application; to rigidly secure materials in place. Size devices for 5x calculated load for concrete inserts and 3x calculated load for other devices.
- D. Gypsum Board Materials: Thickness as indicated on Drawings; maximum available length in place; ends square cut, tapered edges, unless specified otherwise.
1. Standard Gypsum Board: ASTM C36.
 2. Fire Rated Gypsum Board: ASTM C36; fire rated type.
 3. Fiber-Faced Mold and Moisture Resistant Gypsum Board: ASTM C630; standard and fire rated type as indicated on Drawings. Manufactured by Georgia Pacific (Densglass) or approved equal.
 4. Impact Resistant Board: Fiberock AR, fire rated where indicated, manufactured by United States Gypsum Co. (Refer to 2.1, C, above).

2.3 ACCESSORIES

- A. Acoustic Insulation: ASTM C665, Type I, unfaced semi rigid mineral fiber or fiberglass batt type, thickness indicated on Drawings, friction fit, with maximum flame/smoke properties of 25/450 in accordance with ASTM E84.
1. Fire Rated Partitions: Insulation type as required by fire resistant design indicated on Drawings.
 2. Other Partitions: Insulation type as required by sound transmission test indicated on Drawings.
- B. Acoustic Sealant: Nonsag, paintable, nonstaining, butyl-free, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Ohio Sealants, Inc.; SC 175 Acoustical Sound Sealant Non-Flammable - Latex.
 2. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.

3. Tremco, Inc.; Tremflex 834.
 4. Or approved equal.
- C. Corner Beads: Metal or paper faced metal.
- D. Edge Trim: GA 201 and GA 216; Metal, or paper faced metal, profile to suit application.
- E. Plastic Edge Trim:
1. Premasked L Bead: Vinyl type with removable masking or tear away masking leg.
 - a. Trim-Tex; Pullaway Premask L Bead or Tearaway L Bead.
 - b. Or approved equal.
- F. Joint Materials For Gypsum Board: ASTM C475; reinforcing tape, joint compound, adhesive, and water.
1. Use setting type joint compound for exterior locations.
- G. Fasteners: ASTM C1002, Type S12, hardened screws.
- H. VAPOR RETARDERS
1. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
 2. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

A. Metal Stud Installation:

1. Install studs in accordance with ASTM C754.
2. Metal Stud Spacing: As indicated on Drawings.
3. Extend studs minimum 6 inches above ceilings, unless indicated otherwise.
4. Refer to Drawings for indication of partitions extending stud framing through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
5. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs, unless indicated otherwise.
6. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, handrails, grab bars, and other items as required.

B. Wall Furring Installation:

1. Erect wall furring for direct attachment to concrete masonry walls.

2. Erect furring channels horizontally or vertically; space maximum 16 inches on center, not more than 4 inches from floor and ceiling lines or abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 3. Erect metal stud framing tight to concrete masonry walls, attached by adjustable furring brackets.
 4. Fireblock furred spaces at fire rated walls maximum 10 feet on center horizontally and vertically in accordance with BOCA code.
- C. Furring For Fire Ratings: Install furring as required for fire resistance ratings indicated and to GA-600 requirements.
- D. Ceiling Framing Installation:
1. Install in accordance with ASTM C754.
 2. Coordinate location of hangers with other work.
 3. Install ceiling framing independent of walls, columns, and above ceiling work.
 4. Install framing members at following spacings:
 - a. Wire Hangers: 4 feet on center.
 - b. Carrying Channels: 4 feet on center.
 - c. Rigid Furring Channels: 16 inches on center.
 - d. Metal Framing: 16 inches on center.
 - e. Diagonal Bracing: Maximum 4 feet bays.
 - f. Cross Framing: 4 feet on center.
 5. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
 6. Laterally brace entire suspension system.
- E. Direct Suspension Ceiling Installation:
1. Install system in accordance with ASTM C636.
 2. Install grid suspension system with perimeter wall track or angle where grid meets vertical surface. Mechanically join main beams and cross furring members to each other and but cut to fit into wall track.
 3. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing.
- F. Acoustic Accessories Installation:
1. Comply with ASTM C919 and manufacturer's instructions to achieve STC ratings indicated on Drawings.
 2. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
 3. Install acoustic sealant at gypsum board perimeter at following locations:
 - a. Metal Framing: One bead.
 - b. Base Layer: One bead.
 - c. Face Layer: One bead.
 - d. Seal partition face layer at openings for items penetrating partition.
 4. Close off sound flanking paths around or through gypsum board assemblies including sealing partitions above acoustic ceilings.
- G. Gypsum Board Installation:

1. Install gypsum board in accordance with GA-216 and GA-600.
2. Erect single layer in most economical direction, with ends and edges occurring over firm bearing.
3. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
4. At stairwell and other walls extending for heights greater than one floor, install gypsum board horizontally with ends staggered and occurring over framing. Install horizontal control joint at floor lines.
5. Use screws when fastening gypsum board to metal furring or framing.
6. Double Layer Applications: Secure second layer to first with fasteners.
7. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.
8. Treat cut edges and holes in moisture resistant gypsum board with sealant.
9. Place control joints consistent with lines of building spaces as indicated.
10. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials and locations as indicated.

H. INSTALLATION OF VAPOR RETARDERS

1. Place vapor retarders on warm side of insulation. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
2. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
3. Before installing vapor retarders, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
4. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
5. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
6. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

I. Joint Treatment:

1. Tape, fill, and sand exposed joints, edges, and corners in three coats to produce smooth surface ready to receive finishes in accordance with manufacturer's instructions.
2. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.

3.3 ERECTION TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.4 SCHEDULES

- A. Finishes in accordance with GA-214 Level:**
1. Level 1: Above finished ceilings concealed from view.
 2. Level 4: Walls exposed to view.
 3. Level 4: Ceilings exposed to view.

END OF SECTION 09260

SECTION 17000
PROJECT OVERVIEW

PART 1 - GENERAL

1.1 FACILITY OVERVIEW

- A. The purpose of this specification is to provide the Patterson BOE with a technologically advanced educational facility at the Marshall St School.
- B. It should be noted that if a conflict arises between any of the specifications provided in the Division 17 series, that the more stringent shall always apply.

1.2 SUMMARY OF WORK

- A. Systems shall utilize digital technology to integrate the following systems into a single network linking them to a central site:
 - 1. Data & LAN systems
 - a. For data communications, the Wide Area Network will again be the central means of communicating throughout the District for district wide email, network access to shared files and Internet Access. It will be through this medium that Internet Video conferencing; video imaging and other forms of video will be transmitted.
 - b. Locally, the facility will be established with a Local Area Network for all local data and video connectivity. For Telephone and Clock, the District will be utilizing a single manufacturer solution for interchangeable hardware components, troubleshooting and maintenance reasons thus minimizing total costs to the District.
 - 2. Voice systems
 - a. The Voice Communications system based upon School buildings physical proximity to one another might be able to be hubbed at the Districts discretion at a later date. The Voice system will provide extensions in each classroom and office, which will be integrated with the Paging/Intercom and Clock system throughout the school.
 - b. Voice Processing (Voice Mail) will be required for this project and be located in the School, the Voice Mail systems should be able to provide service to all buildings, allowing for a single administration point if so desired by the District. The voice mail system will have the capability of providing mailboxes for all administrative, teachers and support staff, and will also have the feature to restrict the use of mailboxes at the Districts discretion.

- c. The Clock and Paging systems in the school will be locally managed and controlled by the local administration. However, in the event or need for access into any one of the facilities, the WAN systems must be able to interoperate so that a paging call from the Board Offices or other pre-identified location, can page to all locations or an individual school location across the network.
 - d. The Clock, Paging and Telephone/Intercom systems will have the capability to be fully integrated so that control of time and paging capability is system determined by the telephone system.
3. Video/Audio systems
 - a. Each classroom in the school will have a Interactive Whiteboard connected by cabling infrastructure to the MDF, and one paging speaker that will be operated through the telephone system or via a wall phone connected to the paging/intercom system.
 - b. The video system will allow for teacher initiated DVD and VCR instructional CD's and tapes.
4. WAN systems
 - a. The Wide Area Network will be established to interconnect each of the facilities; the telephone systems will be capable of 'network' dialing so that any extension from any telephone system will be dialable via 4 or 5 digits from any other location within the District. Network extension dialing will be achieved over the Wide Area Network routes installed into each of the telephone systems.
5. Intra-Building Communications
 - a. Intra-Building communications will be done through the telephone system utilizing paging, intercom and 4 or 5-digit dialing.
6. Building Automation and Control
 - a. Building Control systems will operate similarly to that of the Security System, allowing for local control, and backup central control at the Board Offices, being accessed over the WAN. To accomplish this will require that each building control system and components installed be IP addressable in order for its data to be transmittable across the Local Area Network and out over the Wide Area Network to comply with BACNET/IP in accordance with ASHRAE 135.
7. Security/Access Control/CCTV
 - a. The facility will have its own Security and Surveillance Systems which will 'share' the Local Area Network as the means of sending alarm and security data, view cameras across the facility and ultimately, across the WAN. The security system is a combination of 3 other systems:
 - IP Surveillance and CCTV
 - Motion Detection

- Access Control
 - b. The Security System will be controlled locally for Administrative and Operational management, with a backup central control located at the Board Offices. The security system will also allow for remote access by the Principal and any designated employees.
- B. These systems shall be integrated by means of an in building Network of cables.
 - 1. Cable Infrastructure
 - a. All technology cabling for the new school will be integrated with the existing data network, telephone, intercom, and security systems, utilizing Category 6; Fiber Optic and coaxial cables.
 - b. Backbone cabling for data shall utilize laser optimized Fiber Optics cable as specified.
 - c. Cabling for data and telecommunications between the jack plate and either MDF or IDF shall be category 6 (minimum) as specified.
 - d. Based on distance limitations from IDF's to the classroom the cabling distance standard of 290' for data networks shall be adhered to. This has been accomplished by identifying either a new MDF or IDF in the school.
 - e. Backbone cabling for the telephone system shall be multi-pair category 6 UTP sufficient to extend all telephone jacks with a minimum of 20% excess cabling and shall be run from the IDF to the Telco DeMarc.
 - f. The standard for each classroom will be at a minimum three (3) quad data outlets, one (1) teacher's outlet, having one (1) voice, and two (2) data; and one (1) video outlet.
 - g. All spaces (classrooms, multi-purpose rooms) will be wired extensions off the clock and paging system.
 - h. All wiring will be in conduit, raceways or wire molding, as approved by Engineer.

1.3 Division 17 Overview

- A. 17100 – Cable Plant
- B. 17200 – Data and LANS
- C. 17300 – Voice Systems
- D. 17400 – Video/Audio Systems
- E. 17500 – WANs
- F. 17700 – Intra-Building Communications Systems
- G. 17800 – Building Automation and Control

H. 17900 – Security Access and Surveillance

1.4 Drawing Overview

A. Associated “T” drawing series:

1. T-100 – General Notes And Legend
2. T-101- North Wing Basement Floor Plan
3. T-111 - North Wing Partial First Floor Plan
4. T-112 – North Wing Partial First Floor Plan
5. T-113 – Central Wing First Floor Plan
6. T-114 – South Wing Floor Plan partial First Floor Plan
7. T-115 - South Wing Floor Plan partial First Floor Plan
8. T-121 – North Wing Partial Floor Plan
9. T-122 - North Wing Partial Floor Plan
10. T-123 - Central Wing Second Floor Plan
11. T-201 – Camera Riser Diagram
12. T-202 – Door Details And Schedule
13. T-203 – Typical Risers And Detail Diagrams
14. T-204 – Typical Risers And Detail Diagrams
15. T-205 - Typical Risers And Detail Diagrams
16. T-206 - Cable Infrastructure Riser
17. T-207 – Jack Matrix
18. T-208 - Jack Matrix Continued
19. T-209 – Technology Plan; Bridge

PART 2 – PRODUCTS

NOT INCLUDED IN THIS SECTION.

PART 3 – EXECUTION

3.1 IMPLEMENTATION

- A. The contractor(s) shall provide and install all hardware, software, connections and appurtances required for fully operational systems.
- B. Contractor to Coordinate with General Contractor (GC) single Prime.

END OF SECTION 17000

SECTION 17300

IP VOICE COMMUNICATIONS

PART 1 – GENERAL

1.1 General

- A. The purpose of this specification is to describe the requirements for IP Telephone/Voice Processing/Paging, for the Paterson Board of Education’s Marshall Street School.
- B. The existing Telephone System Server, Avaya Model 8710, located at the East Side High School, provides five (5) digit dialing between existing buildings and will also be used for voice communications local dialing and toll calls via a gateway interface which is to be installed in the Marshall Street School.
- C. The system utilizes a uniform dialing plan that will allow for 5-digit dialing within the District and 10-digit dialing outside of the network.
- D. The telephone functions will be accomplished by utilizing a PRI circuit from the local telephone company that will be non-channellized, having at a minimum Eight (8) outgoing trunks and Eight (8) incoming trunks. There will be Four (4) Central Office Both Way Trunks (CBWT) that will not be in the PRI to allow for outbound calling in the event of PRI failure. In the event of PRI failure the Verizon Central Office PRI feature “Custom Redirect will be implemented to allow incoming calls to be redirected to the District Office. Outside of the Telephone System there will be Four (4) POTs lines that will provide services for FAX machines and a modem for the Telephone System for remote access. There will be one trunk used for the paging system. There will be one Data Network T1 connected to the Drop and Insert Multiplexer (DIM) connected to the second PRI (T1) port in the Telephone Switch as a WAN Link.
- E. The Telephone System will provide dial access to the building paging system, direct dial to all telephone extensions as well as individual room paging. This will be accomplished by individual number access using DTMF tones. The room paging system speakers will be One (1) way talk out only. The telephone instrument in each room will allow for hands free intercom function, which will facilitate the monitoring of any classroom. The paging system shall have the ability to facilitate distribution of All Call, taped messages, CD’s and impromptu messages. The system shall provide the ability for zone paging for a minimum of Six (6) zones (Cafetorium + Gymnasium + 4 Zones within the building via dial access) plus All Call plus individual room page.
- F. All incoming calls will terminate in the Auto Attendant where callers will route themselves via a menu of options to the appropriate location – All Calls to Teachers will be routed to mailboxes. If a caller wants to speak to the main office, they will be able to press “O” at anytime while in the Auto Attendant
- G. The Administration and Departments will each have their own greeting.
- H. The Auto Attendant will be programmed so that callers will not be routed to any instructional classroom; all callers will be given the option to either leave a message for the teacher or transfer to the Main Office for initial processing.

- I. All Administrators, Teacher, Staff and associated personnel will receive a unique mailbox that is capable of being accessed internally by dialing a four or five digit extension number or externally by dialing a local telephone number.
- J. Individuals who are assigned to specific rooms shall be provided with a telephone extension that corresponds to the room number (ex. Room 200 will be extension x200).
- K. Individuals who are not assigned to specific rooms shall be provided with a unique extension number that does not correspond to a room number. In this way, these individuals will be able to retrieve messages throughout the day from any extension.
- L. All extensions shall be capable of placing outbound Emergency Service Calls (9-1-1). Keying 9-1-1 on the handset shall accomplish this. The system shall permit a simultaneous alert to be sent to the main office without disconnecting from 9-1-1.
- M. The incoming trunks will terminate in the Auto Attendant as indicated above; this will become a separate trunk group from the outbound trunk group. Some of the incoming trunks may be utilized for outbound service as well, based upon peak busy conditions.
- N. Some extensions shall be restricted to internal access only, while others may be limited to local calling or other specific calling areas as designated by the OWNER during the implementation phase.
- O. All stations will be able to place outbound calls but may be restricted/limited in access to specific calling areas, which will be determined during the implementation process.
- P. The system shall be configured to route outgoing calls to the trunk(s) that carry the call at the lowest rate. If the designated trunk group is busy depending on the subscriber's/station's class marking, the call will either be busied out or will be offered to the next designated trunk group. The route selection system shall be capable of automatically changing the ranking of the trunk groups with the time of day to adjust to rate changes and calling pattern.
- Q. The SMDR (Station Message Detail Reporting) will be interfaced with the system via a Windows Drop down Menu (GUI) PC interface. The system reporting function will be programmable, to allow the system administrator the option to select type of report. The system will allow for rate changes to be entered via a CD provided by the vendor for the first year at no additional costs.
- R. System Adds, Moves and Changes will be done through a Windows Drop-Down Menu (GUI) PC interface accessible across the WAN.
- S. The TELEPHONE SYSTEM shall provide a Malicious Call Trace function, which will send to the system printer the ANI, time and date information of any incoming call upon activation by a station. This same function shall record the conversation in the Voice Mail System for later playback.
- T. The System Administrator, who shall be capable of creating mailboxes for users, assigning the appropriate class marks and privileges to each user, and providing backup and restoration functions to the system, shall perform administrative control of the Voice Processing System.

- U. The Voice Mail system is currently installed at the East Side High School ((Modular Messaging). The system provides Voice Mail service to all of the District buildings as their telephone systems are updated to allow for District wide networking. The Contractor shall provide a minimum of 200 Voice Mail Licenses.
- V. The Master Clock will be integrated with the Telephone System to pass time signaling tones for school schedules through the paging system at pre-programmed times.
- W. The system shall network Telephone System-to-Telephone System using ISDN, T-1 and direct fiber input without replacing the cabinet or system as the service requires.
- X. The system shall operate as both a Telephone System and as a Dial Intercom System serving all areas of the building.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION 17300

SECTION 17310

IP VOICE COMMUNICATIONS SWITCHING AND ROUTING EQUIPMENT

PART 1 – GENERAL

- A. The Telephone System will consist of a new Avaya G700 Media Gateway to be installed at the Paterson Marshall Street School. The new G700 Media Gateway shall be connected to an Avaya S8710 Media Server (already existing at the Paterson East Side High School) via the District's Wide Area Network (existing fiber optic network).
- B. See Overview, Section 17300 "IP Voice Communications".

1.1 SUMMARY

- A. This project requires that the new Avaya G700 Gateway be integrated with the Master Clock system.
- B. The new Avaya G700 Gateway shall be integrated with the classroom speakers for paging and intercom through a series of relays.
- C. The system shall be compatible with AC Power.
- D. UPS will be specified and supplied by the Vendor.
- E. The system shall network Gateway-to-Gateway using ISDN, T-1 and direct fiber input without replacing the cabinet or system as the service requires.
- F. The system shall include Automatic Route Selection among the available classes of trunks (CO, Centrex, Tie Trunks etc.) for outgoing calls.
- G. The system shall operate as both a Gateway and as a dial intercom system serving all areas of the building via the Valcom Class Connection Paging Intercom System.
- H. Paging shall be accessible through the telephone system by zone and code.
- I. The system shall be provided with a tone generator to interconnect with the clock system for class changes and other programmed tone signals.
- J. The system shall provide Telco Central Office Class features to analog sets (i.e., 9-1-1; Caller Identification; and malicious Calls.
- K. The System must accommodate station and trunk additions in any peripheral node without the need to re-balance the entire system.
- L. The addition or deletions of these facilities must be accomplished and implemented within one common data base platform. Separate platforms that are in essence managing two different systems will be disqualified.

- M. System must accommodate all system features throughout the entire system. All features must be available to all users. Class of Service for station users will be defined during the station review process.
- N. System must accommodate remote nodes utilizing the following methods: fiber optic multi-mode or single mode, carrier direct point to point dedicated facilities, and IP WAN connectivity. IP enabled survivable remote node applications must accommodate up to 32 users in a single node. The IP node must provide Qos in the event the voice quality parameters degrade, calls can be dynamically transitioned to a circuit-switched connection to insure quality voice connections without disrupting the calls in process.
- O. System must support next generation IP terminals with soft keys and large displays. IP soft phone applications for remote users and classrooms are required.
- P. System must support a robust IP architecture. Each card must support up to 96 subscribers, 1200 call/hour per card and in the event of a Node Master card failure, another card within the node will assume the leadership role tracking all subscribers. Circuits also work together in a leader and follower relation so if an actual subscriber card fails another card will provide resource for these subscribers as well.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Available Manufacturer's/Vendor's
 - 1. Avaya G700 - Proprietary

2.2 TELEPHONE GATEWAY

- A. The Gateway shall include the following features
 - 1. Voice Mail (Modular Messaging), Paging and Call Accounting.
 - 2. Ability for future expansion of trunks and lines.
 - 3. Line Expansion increments of 16.
 - 4. Trunk Expansion increments of 8/8 BRI / 30 (PRI).
 - 5. Type of Switch - Digital.
 - 6. Switching Matrix – TDM
 - 7. Type of Processing Design – Distributed
 - 8. Primary Power – 117 VAC ± 10% 57-63 Hz – 150 Watts
 - 9. Temp. Range – 50 – 95 Degrees F (10-35 Degrees C)
 - 10. Humidity Range - 20-80 % Relative.
- B. The system shall be upgradeable and expandable/scalable to meet future needs and shall at a minimum include the following with unit pricing for installed Pre-cut; Post Cut and uninstalled material only:
 - 1. T1 Media Module with built-in Channel Service Unit (CSU)
 - 2. Universal Card Slot
 - 3. 8-port Analog/Digital Media Module
 - 4. Operating System – Linux (Red Hat Version 6.X or newer)
 - 5. Processor – Intel Pentium Class Server with minimum of 20GB hard drive and 256MB RAM

6. Dimensions (MEDIA SERVER AND GATEWAY) – 19” rack-mounted Gateway / 2U High; 2 UPS (2U High per UPS); P133 data switches (2U High per switch)(Depends on level of reliability).
7. Number of Users – 12,000 IP / 36,000 total stations
8. Number of Trunks – 8,000
9. Total Endpoints (Trunks and Users) per system – 36,000
10. Survivable – Duplicate processors / Server separation up to 6 miles.
11. Data Interface: RS-232, RS-449, RS-530, V.35, and X.21
12. Announcement Sources per S8700 – 50
13. Networking Locations – 64 for ATM PNC / 44 for CSS PNC / any mix of MCC and /or SCC.
14. Trunks – LS; GS; DID; T1 and IP
15. The Gateway must be data ready without requiring reconfiguration or Data Occupancy Considerations
16. Traffic Rate: 36 CCS voice, 36 CCS data
17. Busy Hour Call Attempts – 300,000 BHCA
18. LAN Capacity – Built in LAN functionality; Layer -2 Ethernet
19. MTBF (Minimum) 50,000 hours.
20. Hot swappable – Required (servers, UPS, Avaya P133 switches shall be swappable without powering down)
21. Redundancy – Processors, control network, and bearer network shall be duplicated.

C. Minimum System Features

1. The following are the minimum system features for the Gateway. Additional features shall be included at no additional charge.
 - a. ANI per set
 - b. Basic Call
 - c. Call by Call
 - d. Call Hold
 - e. Class software for Caller ID on all calls
 - f. Call Pickup
 - g. Call Restriction
 - h. Conference Call (6 Way, Station-to-Station, Trunk-to-Trunk)
 - i. Dial Paging for Multiple Zones
 - j. Direct Inward Dial
 - k. Executive Override
 - l. Intercom
 - m. ISDN BRI Hunting
 - n. Least Cost Routing/ARS
 - o. Maintenance Admin. Terminal or PC
 - p. Network Party Name Display
 - q. Off-Premise Extensions
 - r. Password Access
 - s. Gateway to Host Interface
 - t. Privacy and Attendant Lockout
 - u. Remote System Maintenance
 - v. Simultaneous Voice and Data Switching
 - w. SMDR Port, System Software and Printer
 - x. System and Station Abbreviated Dialing
 - y. Uniform Dialing Plan

- z. Universal Wiring (4-pair)
- aa. Audible Message Waiting
- bb. Battery Backup
- cc. Call Forward on No Answer
- dd. Call Park
- ee. Call Waiting
- ff. Camp-on
- gg. Desk to Desk Dialing
- hh. Direct Department Dialing
- ii. Exclusive Hold
- jj. Feature Transparency
- kk. ISDN, PRI/BRI
- ll. PRI Interface
- mm. Local and Remote Programming
- nn. Malicious Call Trace
- oo. Night Service
- pp. Off Hook Alarm Status
- qq. Paging Access
- rr. Power Failure Transfer
- ss. Remote Access and Restriction (DISA)
- tt. Self Diagnostics
- uu. SMDI Interface
- vv. System Auto Dialing
- ww. Toll Restriction
- xx. 'Universal Trunk Cards
- yy. 2-Way Channel
- zz. Windows NT/2000 based system operation control software (most current release)
- aaa. The system will be compatible with single line telephones with "momentary panic buttons" on the instrument.

- D. The System shall include the following as available options:
- 1. Look-Ahead Routing
 - 2. Centralized Attendant Service

- E. The system shall include the following specifications:
- 1. Line Expansion Increments: 16
 - 2. Maximum # of Ports Supported: 700
 - 3. Maximum # of Trunk Group Supported: 512
 - 4. Trunk Expansion Increments: 8/8 (BRI) / 24 (PRI)
 - 5. Maximum # of simultaneous Calls Possible: 400
 - 6. Type of Switch: Digital
 - 7. Switching Matrix: TDM
 - 8. Type of processing design: Distributed
 - 9. Main CPU Type: Motorola 68040 or newer
 - 10. CPU Technology: 32 bit
 - 11. Main System Memory: 16 GB
 - 12. Switching Interface: IP
 - 13. Central Office Trunks: DID, LS, CBWT
 - 14. Tie Trunks: E&M, LS, IS, WS, CTX

- 15. ISDN Interface: PRI, BRI
- 14. T1/E1 Interface: Direct (card), Fiber Optic, Microwave
- 15. Network Nodes Supported (max): 599
- 16. Signaling Systems Supported: SS7, Proprietary, LAPD, DPNSS, QSIG
- 17. Data Lines per Circuit Card (max): 16 One 48-Port DLC included with each chassis

F. The Gateway shall be installed and provided with sufficient cards and facilities to meet the initial Gateway configuration. The system shall be expandable at least 20 percent above its initial configuration without the addition of any hardware other than line and trunk cards and peripheral equipment shelves.

G. The “momentary panic button will be wired to one (1) pair of the RJ11 or RJ45 cable.

2.3 GATEWAY DISTRIBUTION

Trunks	Wired	Equipped
PRI	2	2
CBWT Ports	8	4
Paging Trunk	1	
Extension Ports		
Extensions	130	100
Voice Mail / Auto Attendant		
Ports	12	12
Drives	2	2
Mailboxes (licensed) Dependant on sufficient capacity to allow 5 minutes of recording per mailbox to be stored no more than 14 days and with 20% additional capacity.	600	200
Station Equipment		
Single Line Sets	115	5
Small Multi-line Sets (4 lines) w/speaker phone	10	2
Large Multi-line Sets (12 lines) w/speakerphone	4	2
Large Multi-line Sets add-on mod	4	1

2.4 PC WorkStation

- A. This project requires the use of a PC as needed to provide programming for the Gateway and Voice Processing systems. This shall provide for system control, adds, moves and changes from any authorized port on the WAN.
- B. Unless otherwise specified and required by the manufacturer proposed by the Contractor/Vendor (all alternatives shall be approved by the Engineer), the PC Workstation used for this project shall at a minimum comply with the following:

1. Processor: Intel Pentium 4 – 1.8 GHz CPU or higher
2. Motherboard: Dual Channel UATA
3. Chipset: Intel 845
4. Memory: 4 GB SDRAM or DDR
5. System Bus: 1.6 Ghz
6. Video: 3D AGP Video w/16 GB Memory
7. Hard Drive: Minimum 200GB Ultra ATA 100 7,200 RPM
8. Slots: PCI 4, AGP 1 (minimum)
9. I/O Ports: Serial, 1 Parallel, 2 USB
10. USB 2.0 ports (4)
11. CD-RW 48X – CD-ROM
12. Keyboard: 104+ Keyboard
13. Controller: Ultra ATA 100
14. Mouse: PS/2 Two Button Mouse w/wheel
15. Network Card: 10/100BASE-TX PCI
16. OS: Windows XP Professional (unless specifically required by the product and upon written approval of the Engineer)

2.5 SPEAKERS

- A. Unless otherwise specified on the plans, all internal paging speakers shall be 8-inch coaxial speakers with 10-ounce ceramic magnets capable of 15 watts. The speakers shall have a nominal impedance of 8 ohms and shall be equipped with 24V/70V line transformers and shall be enclosed in suitable housings and baffles for use in a suspended ceiling application.
- B. There will be three (3) speakers in an equal lateral triangle in the classroom with the 4th speaker located over or in close proximity of the Teachers desk.
- C. If a relay other than the one specified in this document is required for muting of the amplifier, it is the vendor's responsibility to identify the type and how it is going to be installed. The vendor will notify the Technology consultant of his plans on implementing the relay.
- D. All exterior speakers shall be Reentrant horn type as required and equipped with 24V/70V transformers. Atlas FC104 or approved equal. Baffles shall fit back box and shall be mounted using approved methods.
- E. The Speakers shall be integrated with the Gateway to allow for paging in the classroom and also by zones. The system will also allow for paging announcements from the District Offices and from any of the District Schools. System shall provide for an All Call, Gymnasium Zone, Auditorium Zone and a minimum of 6 additional zones.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor to provide fully operational and complete system in compliance with the intent of these specifications.
- B. Wiring Method: Install wiring in raceways except within consoles, desks, and counters. Conceal cables and raceways except in unfinished spaces.

- C. Install exposed cables parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by straps, staples, or similar fittings designed and installed to avoid damage to cables. Secure cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, or fittings.
- D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess. Use lacing bars in cabinets.
- E. Control-Circuit Wiring: Install number and size of conductors as recommended by system manufacturer for control functions indicated.
- F. Separation of Wires: Separate speaker-microphone, line-level, speaker-level, and power wiring runs. Install in separate raceways or, where exposed or in same enclosure, separate conductors at least 12 inches (300 mm) for speaker microphones and adjacent parallel power and telephone wiring. Separate other intercommunication equipment conductors as recommended by equipment manufacturer.
- G. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- H. Match input and output impedances and signal levels at signal interfaces. Provide matching networks where required.
- I. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables so they identify media in coordination with system wiring diagrams.
- J. Weatherproof Equipment: For units that are mounted outdoors, in damp locations, or where exposed to weather, install consistent with requirements of weatherproof rating.
- K. Connect wiring according to EIA/TIA-568-A.
- L. It shall be the Contractors responsibility to connect and configure the switch to interface with the existing District Voice Messaging System.

3.2 GROUNDING

- A. Halo Ground all IDF's and MDF, using #2 stranded copper.
- B. Halo Ground with 4 – 20 ft. Rods driven on grade and to building steel above. Maximum resistance to ground shall be 5 Ohms.
- C. Ground cable shields, rain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
- D. Signal Ground Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
- E. Signal Ground Bus: Mount on wall of main equipment room with standoff insulators.

- F. Signal Ground Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.

3.3 SYSTEM PROGRAMMING

- A. Programming: Fully brief Owner on available programming options. Record Owner's decisions and set up initial system program. Prepare a written record of decisions, implementation methodology, and final results.

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 1. Schedule tests with at least seven days' advance notice of test performance.
 2. After installing intercommunication equipment and after electrical circuitry has been energized, test for compliance with requirements.
 3. Operational Test: Test originating station-to-station, all-call, and page messages at each intercommunication station. Verify proper routing and volume levels and that system is free of noise and distortion. Test each available message path from each station on system.
 4. Frequency Response Test: Determine frequency response of two transmission paths, including all-call and paging, by transmitting and recording audio tones. Minimum acceptable performance is within 3 dB from 150 to 2500 Hz.
 5. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings, as follows:
 - a. Disconnect speaker microphone and replace it in the circuit with a signal generator using a 1000-Hz signal. Measure signal-to-noise ratio at paging speakers.
 - b. Repeat test for four speaker microphones and for each separately controlled zone of paging loudspeakers.
 - c. Minimum acceptable ratio is 35 dB.
 6. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 150, 200, 400, 1000, and 2500 Hz into each paging and all-call amplifier, and a minimum of 2 selected intercommunication amplifiers. For each frequency, measure distortion in the paging and all-call amplifier outputs. Maximum acceptable distortion at any frequency is 5 percent total harmonics.
 7. Acoustic Coverage Test: Feed pink noise into system using octaves centered at 500 and 4000 Hz. Use sound-level meter with octave-band filters to measure level at three locations in each paging zone. Maximum permissible variation in level is plus or minus 3 dB; in levels between adjacent zones, plus or minus 5 dB
 8. Power Output Test: Measure electrical power output of each paging amplifier at normal gain settings of 150, 1000, and 2500 Hz. Maximum variation in power output at these frequencies is plus or minus 3 dB.
 9. Signal Ground Test: Measure and report ground resistance at system signal ground. Comply with testing requirements in EIA/TIA-607.
- E. Retesting: Correct deficiencies and retest. Prepare a written record of tests.

- F. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.
- G. Prepare written test reports.
 - 1. Include a record of final speaker-line matching transformer-tap settings, and signal ground-resistance measurement certified by Installer.

3.5 STARTUP SERVICE

- A. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.
- B. Complete installation and startup checks according to manufacturer's written instructions verified by manufacturers certified representative.

3.6 ADJUSTING

- A. On-Site Assistance: The Vendor shall provide on-site assistance in adjusting sound levels, resetting transformer taps, and adjusting controls to meet occupancy conditions.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.

3.7 TESTING, IDENTIFICATION AND ADMINISTRATION

- A. The Owner may use any operating portion of the system prior to Acceptance.
- B. System Cut over shall not constitute acceptance or start of "Service" period.
- C. Acceptance is defined as a satisfactory compliance with these specifications as determined by the Engineer.
- D. The Contractor will test all station equipment and Telephone System to insure that all features specified within this document are operational and working properly.
- E. Contractor will insure that all station equipment, jacks, cable pairs are properly identified in accordance with TIA/EIA-606.
- F. Furnish electronic record of all drawings, in software and format selected by owner.
- G. Furnish Three (3) copies of Hardware and Software documentation to Owner and Engineer.
- H. Contractor to coordinate with General Contractor (GC) single prime.

3.8 CUTOVER

- A. The Contractor will test all features upon cutover.

- B. System Cut over shall not constitute acceptance or start of "Service" period.
- C. The Contractor will provide Seven (7) day notice to Owner and Engineer prior to Cutover.
- D. Prior to Cutover the Owner and Engineer will do a walk through of the building to insure that all instruments are placed in correct rooms.
- E. Owner and Engineer will review cable plant with Contractor to insure proper installation.
- F. Contractor will provide training to Owner maintenance staff and user training.
- G. During Maintenance period, Contractor will provide training to Owner for any new Software or System upgrades.

3.9 TRAINING

- A. The VENDOR shall train Owner's maintenance personnel to adjust, operate, and maintain intercommunication equipment.
 - 1. Train Owner's maintenance personnel on programming equipment for starting up and shutting down, troubleshooting, servicing, and maintaining equipment.
 - 2. For the first year, after the initial Owner's training the Vendor will provide up to three (3) training sessions for maintenance personnel upon the request of the Owner.
 - 3. The Vendor will provide at a minimum three (3) user-training sessions. These sessions shall be coordinated with the District Technology Manager and School Principal's office.
 - 4. Scheduling of training and attendance will be coordinated with District Technology Manager and School Principal's office.

3.10 SUPPORT AND WARRANTY

- A. The Contractor shall include in base Bid a full one-year, no-exception Maintenance Guarantee and Service Contract commencing on the date at the end of One (1) Warranty period.
- B. The guarantee shall include, but not be limited to, parts, labor, cable, batteries, remote maintenance, and any other appurtenances that may be required.
- C. Emergency service shall be Two (2) hours throughout service and maintenance period.
- D. If any component fails more than twice during Maintenance and Service period the Contractor will replace the component at their expense and acceptance for the failed component will start from that point.
- E. Any major failure of system boards, memory, and software, during Maintenance and Service period will institute replacing at Contractors expense.
- F. Contractor shall state, the amount to provide an additional full four-year Maintenance and Service Contract to become effective upon expiration of the one-year contract provided under the base bid.
- G. All conditions, inspections, and requirements as called for under the base bid contract shall apply under the additional term contract.

- H. It should be noted that the quotation should be a firm price with no allowance for escalation.
- I. Contractor must notify Owner in writing sixty days prior to expiration of Maintenance Contract.
- J. If Owner accepts additional four-year Maintenance and Service Contract, a payment is due on the anniversary of acceptance.
- K. The Owner reserves the right to reject one, two, three, or four years of the Maintenance Agreement.
- L. An annual maintenance cost shall be provided for the system described for year 2 thru 5.
- M. A unit maintenance cost shall be provided for additional telephone instruments.
- N. Contractor is to provide a maintenance formula or add-ons or deletions.
- O. Contractor is to provide a hardware and software options schedule with associated costs for Pre-Cutover, Post-Cutover and materials only

END OF SECTION 17310

SECTION 17320

IP VOICE COMMUNICATIONS STATION EQUIPMENT

PART 1 – GENERAL

A. See Overview Section 17300 “IP Voice Communications”.

1.1 SUMMARY

- A. This project requires the use of Analog and Digital Telephones that are compatible with the District’s existing Avaya S8710 Media Server located in the Paterson East Side High School and the new Avaya G700 Media Gateway System specified in Section 17310 “IP Voice Communications Switching And Routing Equipment”.
- B. Analog sets will be located in none administrative and educational program areas, such as maintenance areas and the MDF.
- C. Digital phones will locate in administration and educational areas.
- D. All digital phones will have speakerphone and intercom capabilities for integration into the building paging system.
- E. Phones will allow for dial intercom capabilities serving all areas of the building.
- F. Paging shall be accessible through the telephone system by zone and code.
- G. All phones must be ADA Compliant.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Available Manufacturer’s/Vendor’s
 - 1. Avaya - Proprietary
- B. The following types of station equipment will be supported by the Telephone System specified in Section 173100 “IP Voice Communications Switching And Routing Equipment”.
 - 1. Single line instruments with fixed “Hold” and “Release” keys and a “Message Waiting” lamp as a minimum.
 - 2. 2 line instruments with feature buttons, LCD, with speakerphone, hands free intercom and display. Avaya 2410 Telephone Set.
 - 3. Multi-Button instruments with 8 –12 feature buttons, LCD, 12 or more feature buttons, with speakerphone, hands free intercom and display. Avaya 2420 Telephone Set

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor to provide fully operational and complete system in compliance with the intent of these specifications
- B. Phones will be installed and connected to wiring according to EIA/TIA-568-A
- C. Phones will be labeled with proper telephone and extension number
- D. Phone number, room location, jack identification number and port number will be entered into an inventory database.

3.3 TELEPHONE PROGRAMMING

- A. Programming: Fully brief Owner on available programming options. Record Owner's decisions and set up initial system program. Prepare a written record of decisions, implementation methodology, and final results.

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. Schedule tests with at least seven days' advance notice of test performance.
 - 2. After installing telephone instruments test for compliance with requirements.
 - 3. Operational Test: Test originating station-to-station, all-call, and page messages at each telephone station. Verify proper routing and volume levels and that system is free of noise and distortion. Test each available message path from each station on system.
 - 4. Frequency Response Test: Determine frequency response of two transmission paths, including all-call and paging, by transmitting and recording audio tones. Minimum acceptable performance is within 3 dB from 150 to 2500 Hz.
 - 5. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings, as follows:
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 - b. Repeat test for four speaker microphones and for each separately controlled zone of paging loudspeakers.
 - c. Minimum acceptable ratio is 35 dB.
 - 6. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 150, 200, 400, 1000, and 2500 Hz into each paging and all-call amplifier, and a minimum of 2 selected intercommunication amplifiers. For each frequency, measure distortion in the paging and all-call amplifier outputs. Maximum acceptable distortion at any frequency is 5 percent total harmonics.
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- C. Retesting: Correct deficiencies and retest. Prepare a written record of tests.
- D. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.

3.5 STARTUP SERVICE

- A. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.
- B. Complete installation and startup checks according to manufacturer's written instructions.

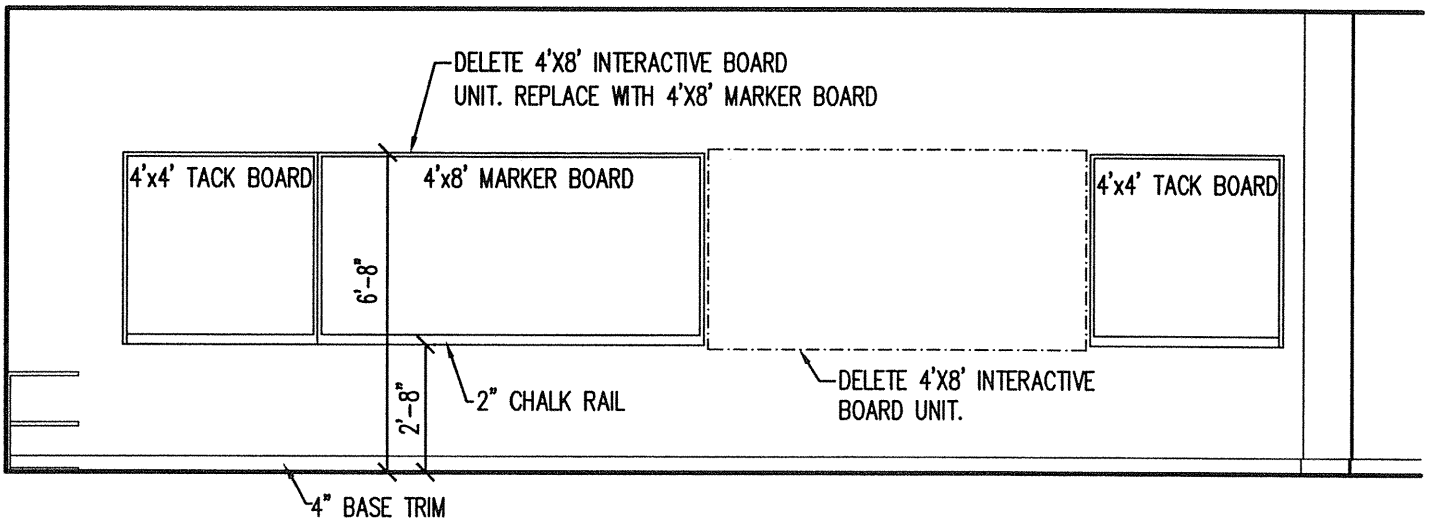
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3.7 TRAINING

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 - 1. Train Owner's maintenance personnel on programming equipment for starting up and shutting down, troubleshooting, servicing, and maintaining equipment.
 - 2. For the first year, after the initial Owner's training the Vendor will provide up to three (3) training sessions for maintenance personnel upon the request of the Owner.
 - 3. The Vendor will provide at a minimum three (3) user-training sessions. These sessions shall be coordinated with the District Technology Manager and School Principal's office.

END OF SECTION 17320



7 TYPICAL CLASSROOM ELEVATIONS

SCALE: 1/4" = 1'-0"

DesignIdeasGroup
architecture + planning, llc

15 Bethany Street
New Brunswick, NJ 08901
T: 732.249.6242 F: 732.247.1826

60 West Broad Street
Bethlehem, PA 18018
T: 610.807.0420 F: 610.807.0602

Project:
MARSHALL STREET ELEMENTARY
SCHOOL
PATERSON, NJ

Owner:
NJ SDA
WEST STATE STREET
TRENTON, NJ

Project no.:
2003-007

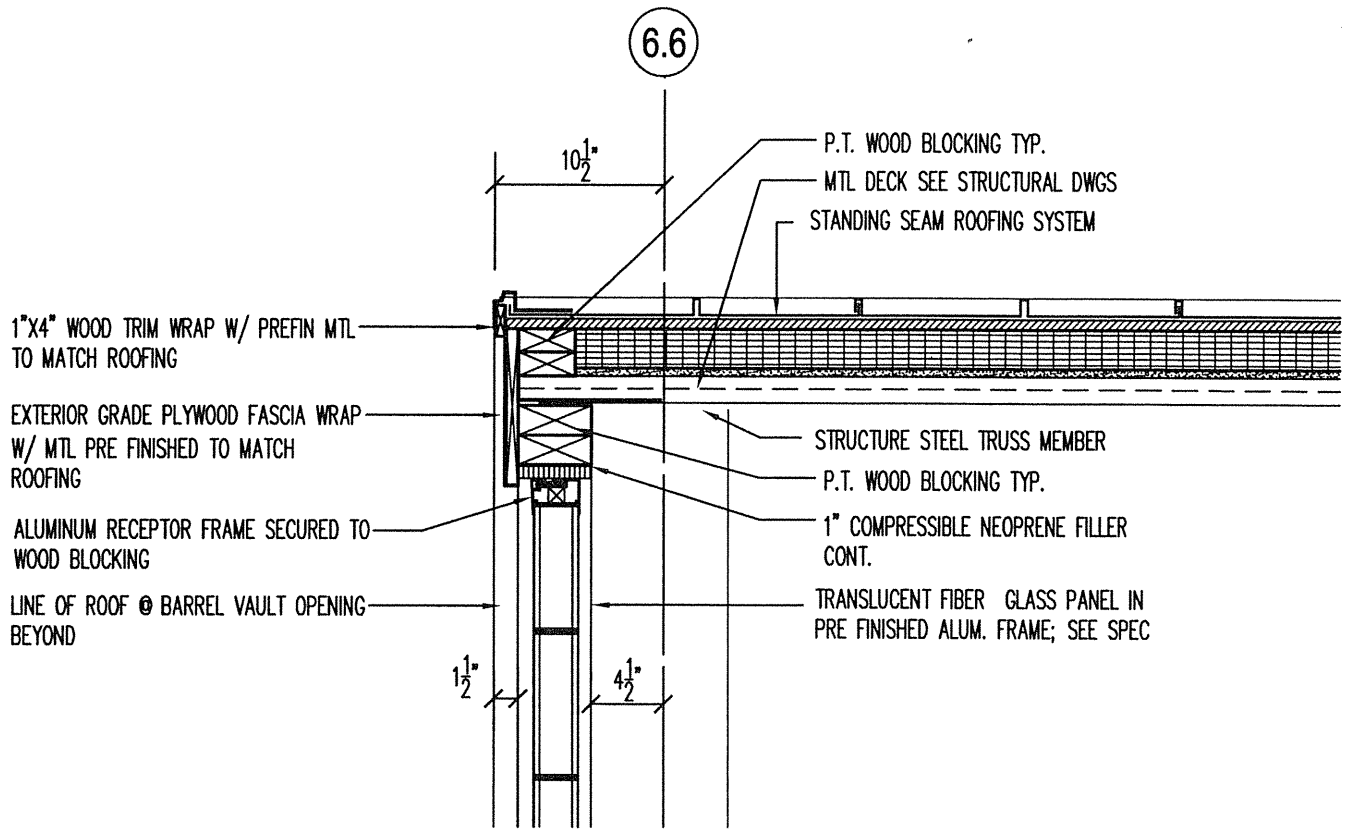
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Chkd. by:
CC

Dwn. by:
BH

Date:
08/27/09

Dwg. No.:
SKA-1
REFER DWG.A-1.2



4 | HEAD DETAIL REFER TO WALL SECT. DWGS. A4.6 & A4.8

SCALE: 1" = 1'-0"

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15 Bethany Street
New Brunswick, NJ 08901
T: 732.249.6242 F: 732.247.1825

60 West Broad Street
Bethlehem, PA 18018
T: 610.807.0420 F: 610.807.0602

Project:
MARSHALL STREET ELEMENTARY
SCHOOL
PATERSON, NJ

Owner:
NJ SDA
WEST STATE STREET
TRENTON, NJ

Project no.:
2003-007

Scale:
1"=1'-0"

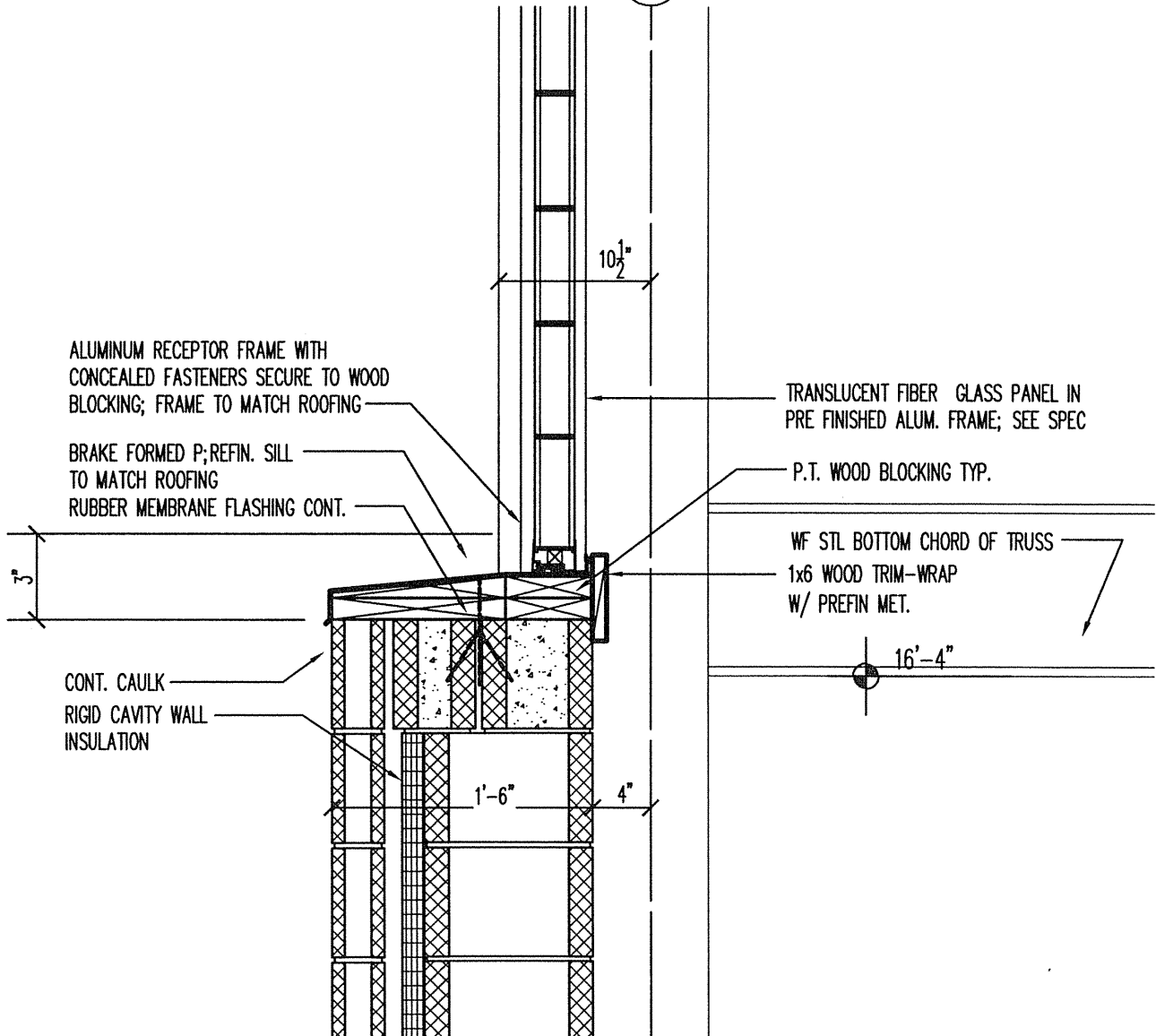
Chkd. by:
CC

Dwn. by:
BH

Date:
08/27/09

Dwg. No.:
SKA-2
REFER DWG. A-1.3

6.6



5 | SILL DETAIL

REFER TO WALL SECT. DWGS. A4.6 & A4.8

SCALE: 1" = 1'-0"

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New Brunswick, NJ 08901
T: 732.249.6242 F: 732.247.1825

60 West Broad Street
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Project:
MARSHALL STREET ELEMENTARY
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PATERSON, NJ

Owner:
NJ SDA
WEST STATE STREET
TRENTON, NJ

Project no.:
2003-007

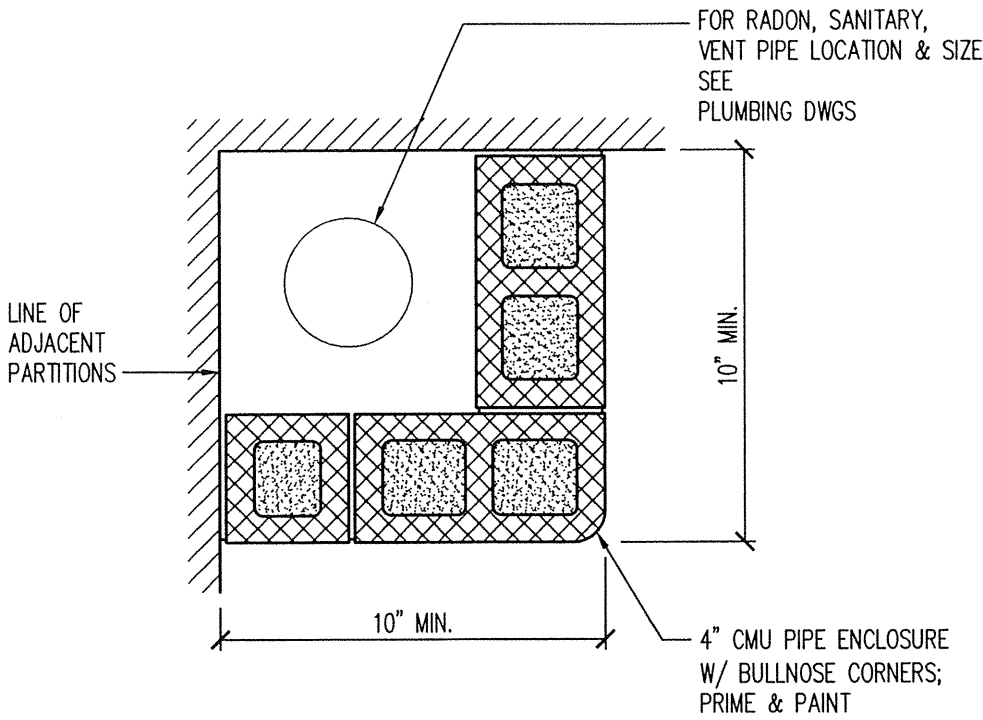
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Chkd. by:
CC

Dwn. by:
BH

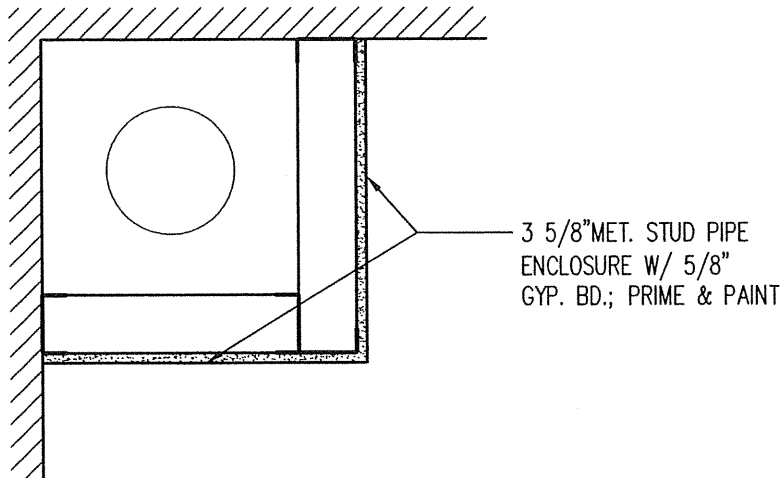
Date:
08/27/09

Dwg. No.:
SKA-3
REFER DWG.A-1.3



4 | PLAN DETAIL

SCALE: 1" = 1'-0"



5 | PLAN DETAIL

SCALE: 1" = 1'-0"

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Project:
MARSHALL STREET ELEMENTARY
SCHOOL
PATERSON, NJ

Owner:
NJ SDA
WEST STATE STREET
TRENTON, NJ

Project no.:
2003-007

Scale:
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Chkd. by:
CC

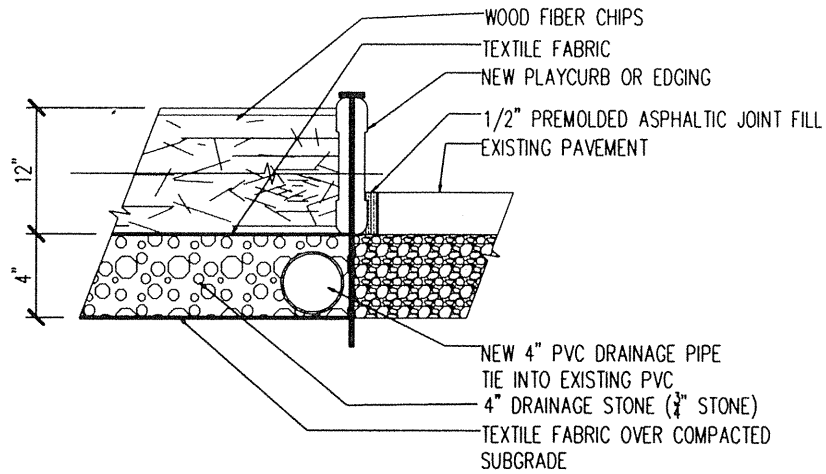
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Date:
08/27/09

Dwg. No.:
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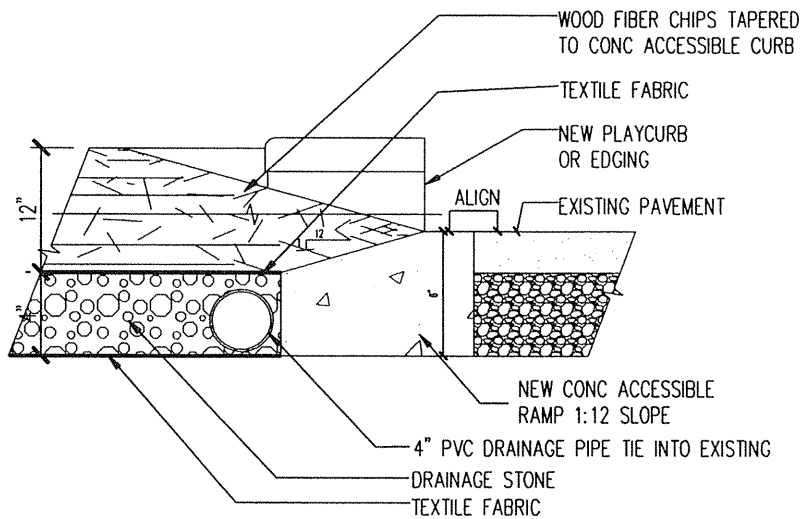
15 Bethany Street
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60 West Broad Street
Bethlehem, PA 18018
T: 610.807.0420 F: 610.807.0602



A CURB DETAIL @ PLAY STRUCTURE

SCALE: 1 1/2" = 1'-0"



B ACCESSIBLE RAMP DETAIL

SCALE: 1 1/2" = 1'-0"

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18 Bethony Street
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Project:
 MARSHALL STREET ELEMENTARY
 SCHOOL
 PATERSON, NJ
Owner:
 NJ SDA
 WEST STATE STREET
 TRENTON, NJ

Project no.:
 2008-007
Scale:
 1 1/2" = 1'-0"

Client, lgt:
 OC
Draw. lgt:
 BH

Date:
 08/27/08
Draw. No.:
 SKA-5
 REFER DWG.A-0.9

SDA

NJ SCHOOLS DEVELOPMENT AUTHORITY

STATE OF NEW JERSEY



ECONOMIC DEVELOPMENT AUTHORITY

Design Ideas Group

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Robert M. Jankovic, AIA
NJ RA 08888 NY RA 018723 OK RA 06-00084 HI RA 2813
NJ RA A1 11515
Joseph P. Tomasco, AIA, PP
NJ RA 02008 NJ PP 2442 PA RA 08752 CT RA 0802
DC RA AIC-10056 DE RA 06-00078 MD RA 0887
VA RA 040181784 VT RA 03-001370
Jeffrey D. Venable, AIA
NJ RA A1 08271 NY RA 022718-1
Walter W. Venable, AIA
NJ RA A1 08283 NY RA 01082-1

CONSTRUCTION PROGRAM FOR THE
MARSHALL STREET ELEMENTARY SCHOOL
DOE# 40104N01-02-0169
NJSDA# PA-0006-C03
DCA# 01CCHPC-05-013 ERU# 6095-05
ADDRESS
NJ SDA
WEST STATE STREET
TRENTON, NEW JERSEY

JOB NO. 23110

ISSUED

05/15/09 ISSUED FOR BID

07/06/09 ISSUED FOR BID

08/06/09 DCA REVIEW COMMENTS

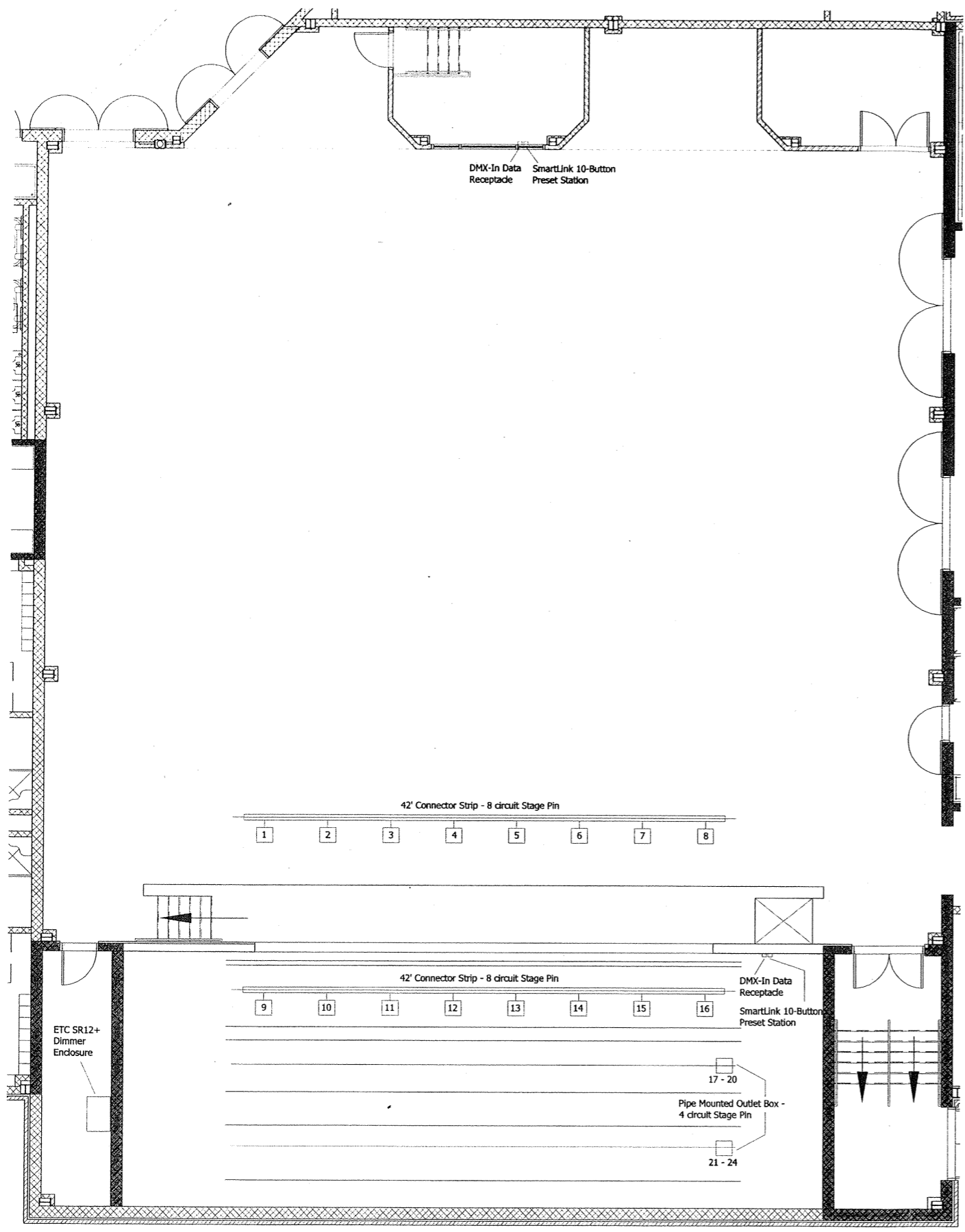
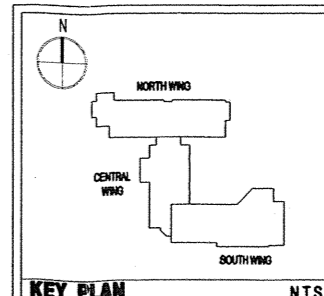
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**PARTIAL FLOOR PLAN -
AUDITORIUM LIGHTING**

DRAWING No.

AL-1.0

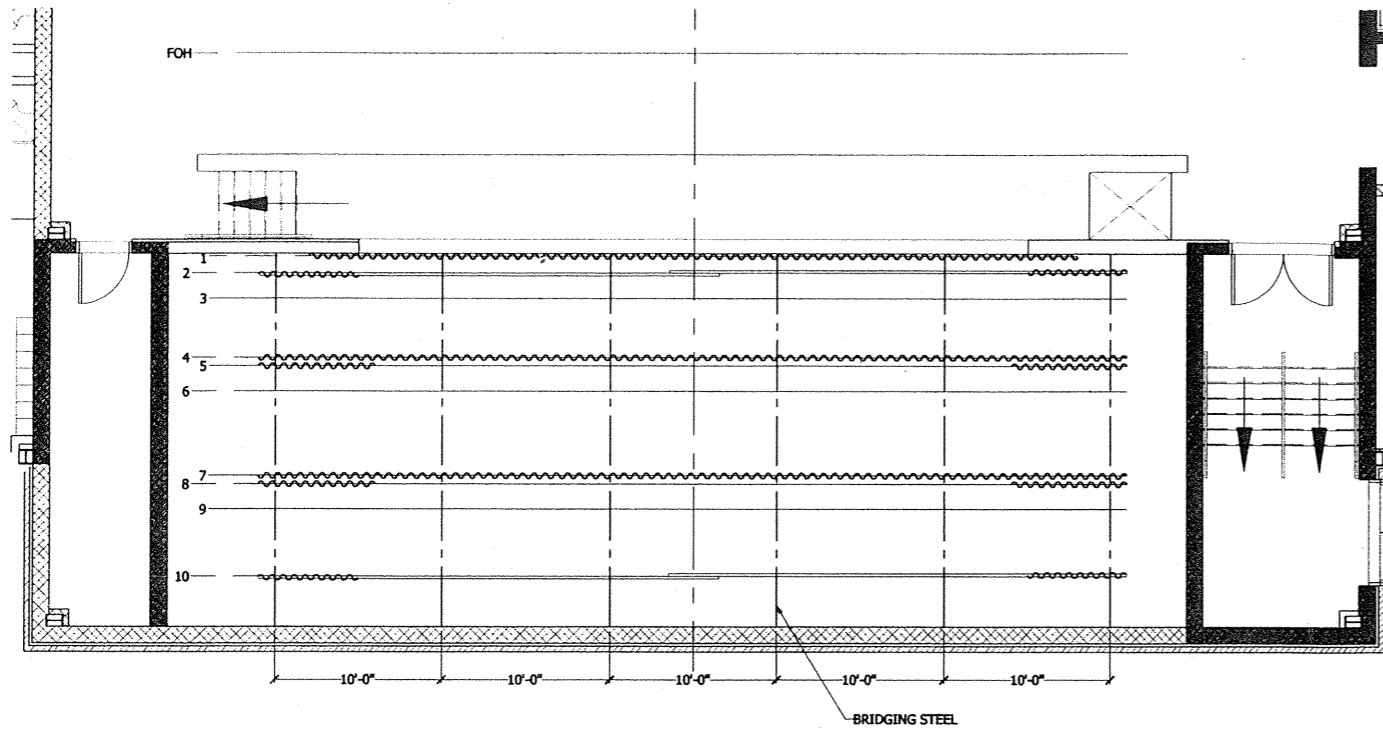
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NOTE:
ALL STAGE DRAPERY MUST BE
INHERENTLY FLAME RETARDANT (IFR)

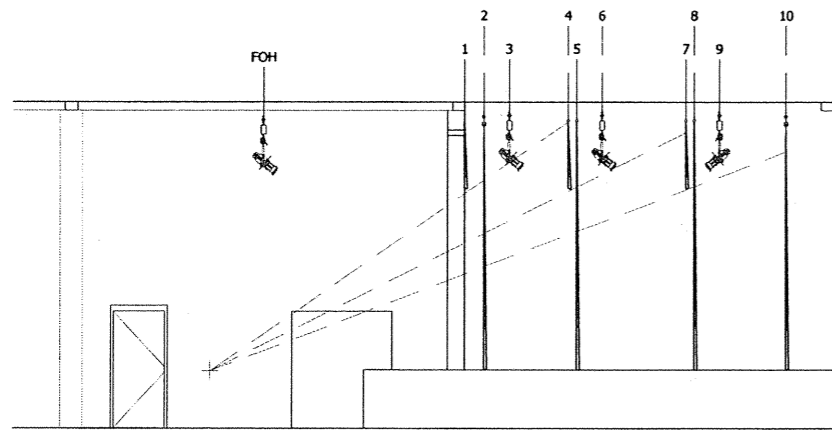


1 PARTIAL FLOOR PLAN - AUDITORIUM LIGHTING
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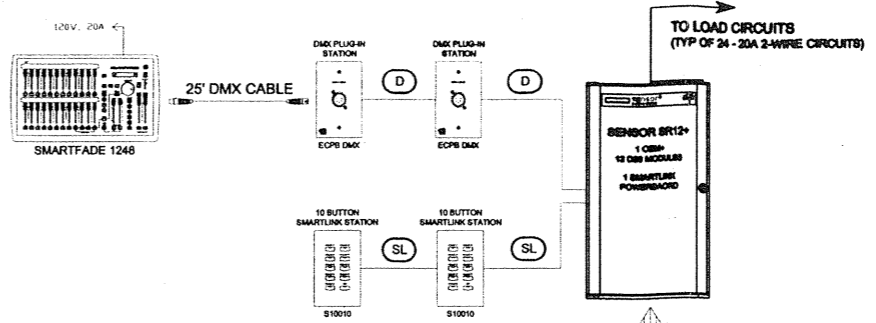
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1 PARTIAL FLOOR PLAN - AUDITORIUM RIGGING
1/4"=1'-0"



2 SECTION thru BACKSTAGE
1/4"=1'-0"



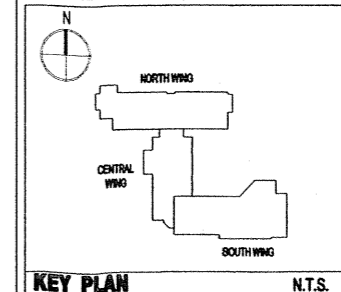
CONTROL WIRING LEGEND		
SYMBOL	WIRE TYPE(S)	SIGNAL
(D)	(1) Shielded 8/20	DMX
(SL)	(1) Shielded 8/21	SMARTLINK POWER
(S)	(1) #14 AWG Wire	SMARTLINK POWER

Notes:
 All control wiring to be provided by Electrical Contractor unless noted otherwise.
 Load capacity requires separate analysis.
 Cable runs are continuous between connected devices. No splicing allowed.
 "DMX" and "SmartLink" control cables run from end to end, and to nearest 90° corner.
 Only duct only, no marking or individual lines run allowed.

ITEM	DISTANCE FROM PROSCENIUM	BATTEN LENGTH	TRIM HEIGHT **	CURTAIN HEIGHT	CURTAIN WIDTH	CURTAIN FULLNESS	CURTAIN MATERIAL	TRACK LENGTH	NOTES ACCESSORIES
0	Proscenium Line	0' - 0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Valance	0' - 0"	46' - 0"	15' - 0"	4' - 0"	46' - 0"	50%	21 Oz. Velour	N/A
2	Main Act Curtain	1' - 2"	52' - 0"	15' - 0"	2 X 14' - 0"	2 X 27' - 6"	50%	21 Oz. Velour	2 X 27' - 6"
3	1st Electric	2' - 8"	52' - 0"	14' - 0"	N/A	N/A	N/A	N/A	ADC 280 Track with 3" Trim Chain
4	1st Border	6' - 2"	52' - 0"	15' - 0"	4' - 0"	52' - 0"	0%	16 Oz. Velour	N/A
5	1st Legs	6' - 8"	52' - 0"	15' - 0"	2 X 15' - 0"	2 X 4' - 0"	0%	16 Oz. Velour	N/A
6	2nd Electric	8' - 2"	52' - 0"	14' - 0"	N/A	N/A	N/A	16 Oz. Velour	N/A
7	2nd Border	13' - 2"	52' - 0"	15' - 0"	4' - 0"	52' - 0"	0%	16 Oz. Velour	N/A
8	2nd Legs	13' - 8"	52' - 0"	15' - 0"	2 X 15' - 0"	2 X 4' - 0"	0%	N/A	N/A
9	3rd Electric	15' - 2"	52' - 0"	14' - 0"	N/A	N/A	N/A	N/A	N/A
10	Upstage Traveler	19' - 2"	52' - 0"	15' - 0"	2 X 14' - 0"	2 X 27' - 6"	0%	16 Oz. Velour	2 X 27' - 6"

** - Trim Height is distance from finished floor to the bottom of the support pipe.

NOTE:
 ALL STAGE DRAPERY MUST BE
 INHERENTLY FLAME RETARDANT (IFR)



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CONSTRUCTION PROGRAM FOR THE
MARSHALL STREET ELEMENTARY SCHOOL
 DOB# 4010-N01-02-0169
 NISDA# PA-006-C03
 DCA# OLCEHPC-05-013 ERU# 6095-05

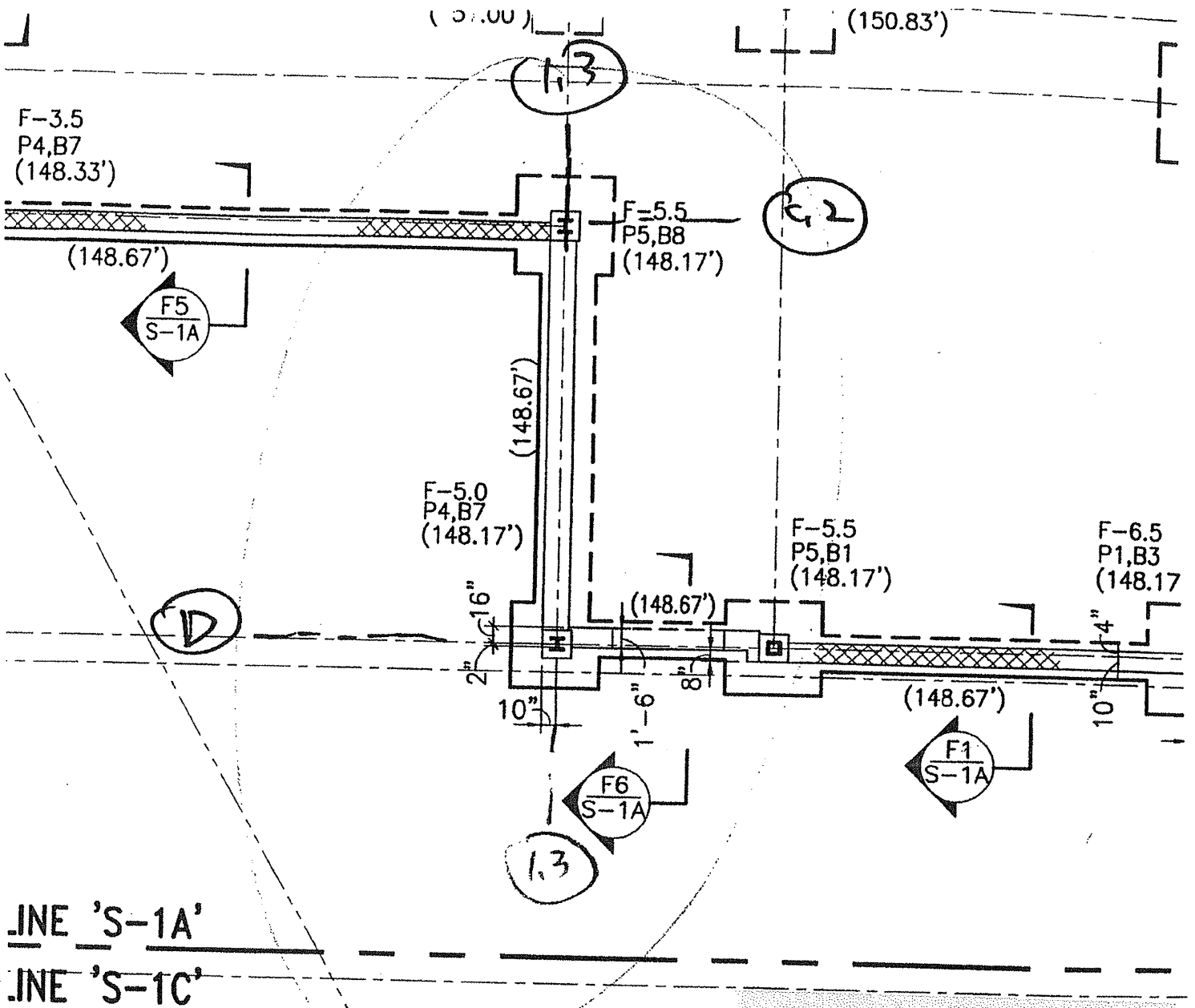
ADDRESS
 NJ SDA
 WEST STATE STREET
 TRENTON, NEW JERSEY

JOB NO. 23110
ISSUED
05/15/09 ISSUED FOR BID
07/06/09 ISSUED FOR BID
08/06/09 DCA REVIEW COMMENTS

DRAWING TITLE
AUDITORIUM DETAILS

DRAWING No.
AL-2.0

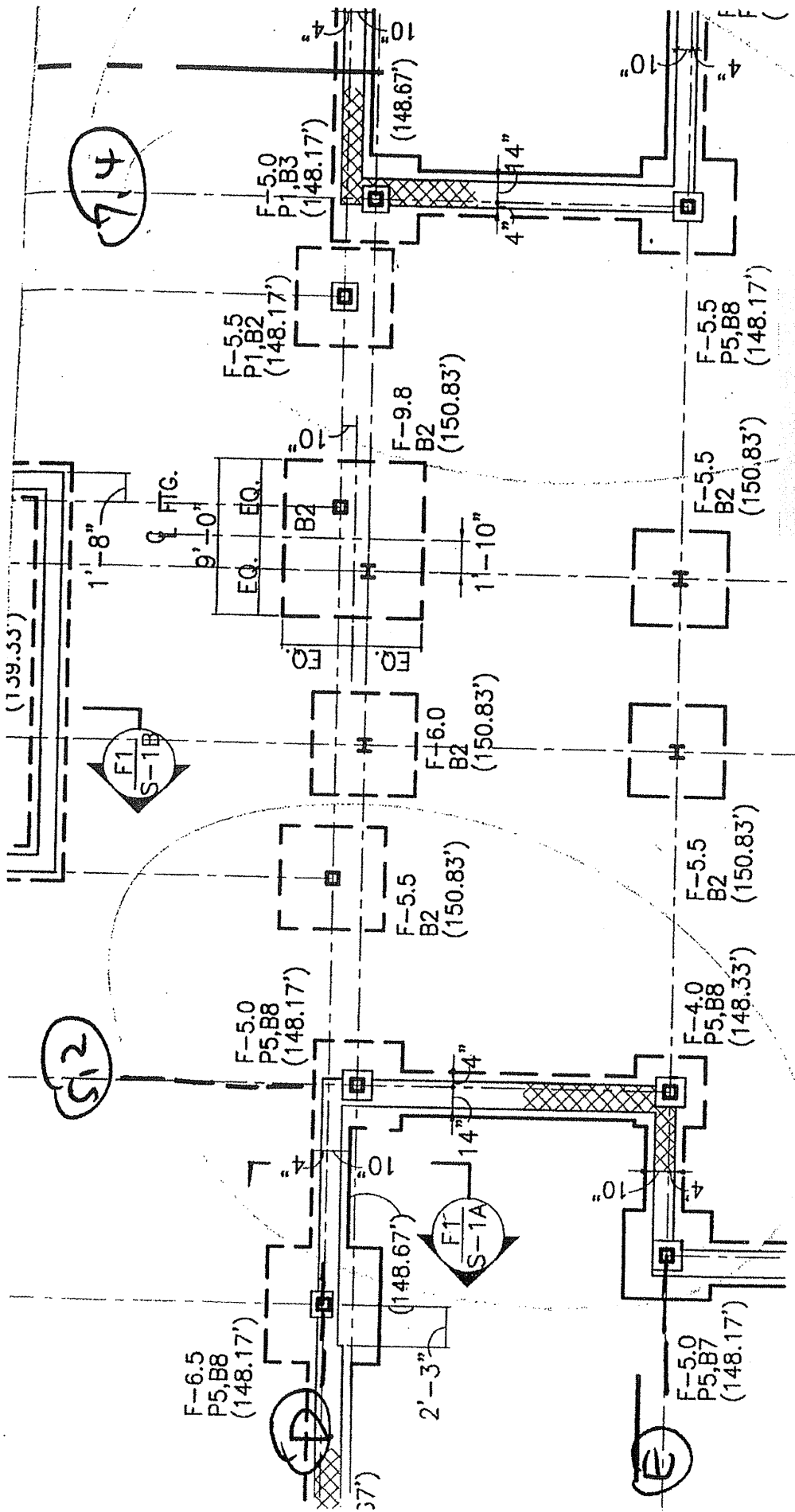
DWG. NO. OF



<u>E</u>
T.REINF. H WAY
6" O.C.
4
5
6" O.C.
5
" "

CONCRETE PIER SCH		
MARK	SIZE	VERT. F
P1	18" x 18"	4 - # 7
P2	32" x 32"	8 - # 7
P3	20" x 22"	4 - # 8
P4	15" x 15"	4 - # 7
P5	18" x 15"	4 - # 7
P6	20" x 20"	4 - # 8

RFI-24
CEC # 1
8/25/09



RF1-24
 CEC #2
 8/25/09

(NORTH WING)

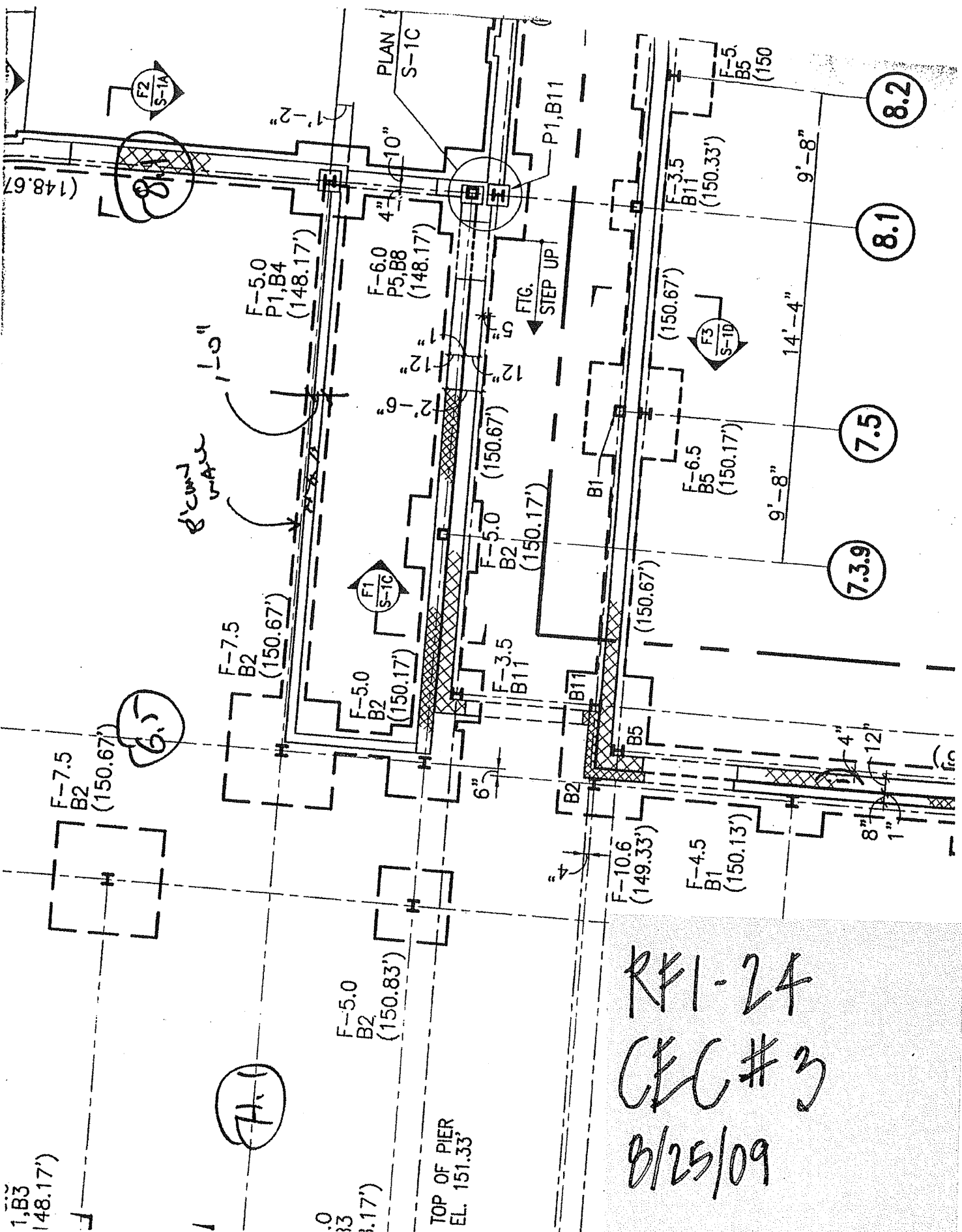
TOP OF SLAB EL. + 0'-0" (DATUM)

LOADING CAPACITY OF 2 TONS PER
 THE OWNER, MUST VERIFY ALL
 REINFORCEMENT IN FOOTINGS.

CONCRETE SLAB, REINFORCED
 ACCORDING TO MECHANICAL DRAWING

FOR RADIC
 DETAILS C
 DWGS. FO
 MITIGATION

TYPICAL
 INICAL
 ADON



Commemorating the Opening of

[Insert School Name]

[Insert Date]

State of New Jersey

Jon S. Corzine, Governor

New Jersey Department of Education

Lucille E. Davy, Commissioner of Education

New Jersey Schools Development Authority

Kris Kolluri, Chief Executive Officer

[Insert District] Board of Education

[Insert Superintendent's Name], Superintendent of Schools

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