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**ADDENDUM NO. 3**

Date of Addendum: February 14, 2023

Project Name: Gaston County Schools – Grier Middle School

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**PROJECT INFORMATION**

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- A. Owner: Gaston County Schools
- B. Architect: LS3P
- C. Architect Project Number: 9201-218240

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**NOTICE TO BIDDERS**

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- A. This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.
- B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.
- C. The date for receipt of bids is unchanged by this Addendum, at same time and location.

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**ATTACHMENTS**

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- A. This Addendum includes the following attached Documents and Specification Sections:
  - 1. Document 003132 – GEOTECHNICAL REPORT, dated February 14, 2023 (with new Test Pits Report Attachment).
  - 2. Document 004113 – BID FORM, dated February 14, 2023, (reissued).
  - 3. Document 006000- PROJECT FORMS, dated February 14, 2023, (reissued).
  - 4. Document 007300 – SUPPLEMENTARY CONDITIONS, dated February 14, 2023, (new).
  - 5. Section 012300 – ALTERNATES, dated February 14, 2023, (reissued).
  - 6. Section 087100 – DOOR HARDWARE, dated February 14, 2023 (reissued).
  - 7. Section 088853 – SECURITY GLAZING, dated February 14, 2023, (new).
  - 8. Section 123553 – LABORATORY CASEWORK, dated February 14, 2023, (reissued).
  - 9. Section 311000 – SITE CLEARING AND EROSION CONTROL, dated February 14, 2023, (reissued).
  - 10. Section 312000 – EARTH MOVING, dated February 14, 2023, (reissued).
  - 11. Section 321216 – ASPHALT PAVING, dated February 14, 2023, (reissued).
  - 12. Section 321313 – CONCRETE PAVING, dated February 14, 2023, (reissued).

13. Section 321400 – UNIT PAVING, dated February 14, 2023, (reissued).
14. Section 321530 – AGGREGATE PAVING, dated February 14, 2023, (reissued).
15. Section 321801 – TRACK AND FIELD LINE MARKINGS, dated February 14, 2023, (reissued).
16. Section 321802 – FIELD EVENT MATERIALS, dated February 14, 2023, (reissued).
17. Section 323113 – CHAIN LINK FENCES AND GATES, dated February 14, 2023, (reissued).
18. Section 323119 – DECORATIVE METAL FENCES AND GATES, dated February 14, 2023, (reissued).
19. Section 323223 – SEGMENTAL RETAINING WALLS, dated February 14, 2023, (reissued).
20. Section 328400 – IRRIGATION SYSTEM, dated February 14, 2023, (reissued).
21. Section 329200 – TURF AND GRASSES, dated February 14, 2023, (reissued).
22. Section 329300 – PLANTS, dated February 14, 2023, (reissued).
23. Section 331100 – WATER DISTRIBUTION SYSTEM, dated February 14, 2023, (reissued).
24. Section 333100 – GRAVITY FLOW SANITARY SEWERAGE SYSTEM, dated February 14, 2023, (reissued).
25. Section 334100 – STORM DRAINAGE SYSTEM, dated February 14, 2023, (reissued).
26. Section 334600 – SUBDRAINAGE, dated February 14, 2023, (reissued).
27. RFI Questions and Answers (For Information Only).

B. This Addendum includes the following attached Sheets:

1. Civil Sheet C1.0 – TITLESHEET, dated February 14, 2023, (reissued).
2. Civil Sheet C1.1 – LEGEND & REVISION NOTES, dated February 14, 2023, (reissued).
3. Civil Sheet C3.2 – E&SC PHASE 3, dated February 14, 2023, (reissued).
4. Civil Sheet C3.3 – E&SC PHASE 4, dated February 14, 2023, (reissued).
5. Civil Sheet C3.4 – E&SC PHAE 5, dated February 14, 2023, (reissued).
6. Civil Sheet C4.0 – SITE PLAN, dated February 14, 2023, (reissued).
7. Civil Sheet C5.0 – DRAINAGE PLAN, dated February 14, 2023, (reissued).
8. Civil Sheet C5.7 – STORM DRAINAGE DETAILS, dated February 14, 2023, (reissued).
9. Civil Sheet C5.8 – STORM DRAINAGE DETAILS, dated February 14, 2023, (reissued).
10. Civil Sheet C5.10 – ROOF DRAINAGE PLAN, dated February 14, 2023, (reissued).
11. Civil Sheet C6.0 – OVERALL GRADING PLAN, dated February 14, 2023, (reissued).
12. Civil Sheet C6.2 – ENLARGED GRADING PLAN, dated February 14, 2023, (reissued).
13. Civil Sheet C7.1 – SITE DETAILS, dated February 14, 2023, (reissued).
14. Civil Sheet C7.3 – SITE DETAILS, dated February 14, 2023, (reissued).
15. Landscape Sheet L1.0 – LANDSCAPE PLAN, dated February 14, 2023, (reissued).
16. Landscape Sheet L1.2 – LANDSCAPE SCHEDULE, DETAILS & NOTES, dated February 14, 2023, (reissued)
17. Structural Sheet S-211 – 2<sup>ND</sup> FLOOR FRAMING PLAN – AREA A, dated February 14, 2023, (reissued).
18. Structural Sheet S-212 – 2<sup>ND</sup> FLOOR FRAMING PLAN – AREA B, dated February 14, 2023, (reissued).
19. Structural Sheet S-401 – FRAMING SECTIONS & DETAILS, dated February 14, 2023, (reissued).

20. Architectural Sheet A-001.C – ARCHITECTURAL SITE PLAN – FINAL dated February 14, 2023, (reissued).
21. Architectural Sheet A-100C – BASEMENT FLOOR PLAN AREA C, dated February 14, 2023, (reissued).
22. Architectural Sheet A-101A – FIRST FLOOR PLAN AREA A, dated February 14, 2023, (reissued).
23. Architectural Sheet A-121B – FIRST FLOOR REFLECTED CEILING PLAN – AREA B, dated February 14, 2023, (reissued).
24. Architectural Sheet A-122B – SECOND FLOOR REFLECTED CEILING PLAN – AREA B, dated February 14, 2023, (reissued).
25. Architectural Sheet A-402 – ENLARGED PLAN – RESTROOMS, dated February 14, 2023, (reissued).
26. Architectural Sheet A-510 – SECTION DETAILS, dated February 14, 2023, (reissued).
27. Architectural Sheet A-601 – DOOR SCHEDULE BASEMENT & FIRST FLOOR, dated February 14, 2023, (reissued).
28. Architectural Sheet A-602 – DOOR SCHEDULE SECOND FLOOR, TYPE LEGEND & FRAME TYPES, dated February 14, 2023, (reissued).
29. Architectural Sheet A-604 – ALUMINUM STOREFRONT SCHEDULES & TYPE LEGEND, dated February 14, 2023, (reissued).
30. Architectural Sheet A-700 – INTERIOR ELEVATIONS – ADMINISTRATION SUITE, dated February 14, 2023, (reissued).
31. Architectural Sheet A-702 – INTERIOR ELEVATIONS – ENTRY LOBBY, dated February 14, 2023, (reissued).
32. Architectural Sheet A-704 – INTERIOR ELEVATIONS – BAND & CHORUS, dated February 14, 2023, (reissued).
33. Architectural Sheet A-705 – INTERIOR ELEVATIONS – MEDIA CENTER, dated February 14, 2023, (reissued).
34. Architectural Sheet A-706 – INTERIOR ELEVATIONS – CAFETERIA, dated February 14, 2023, (reissued).
35. Architectural Sheet A-707 – INTERIOR ELEVATIONS – CAFETERIA, dated February 14, 2023, (reissued).
36. Architectural Sheet A-710 – INTERIOR ELEVATIONS – GYM, dated February 14, 2023, (reissued).
37. Architectural Sheet A-712 – FINISH LEGEND AND NOTES, dated February 14, 2023, (reissued).
38. Architectural Sheet A-714 – SECOND FLOOR AND BASEMENT FINISH SCHEDULE, dated February 14, 2023, (reissued).
39. Telecommunications Sheet T-002 – TECHNOLOGY SYMBOLS, dated February 14, 2023, (reissued).
40. Telecommunications Sheet T-502 – TECHNOLOGY DETAILS, dated February 14, 2023, (reissued).
41. Telecommunications Sheet T-702 – TECHNOLOGY RISER DIAGRAMS, dated February 14, 2023, (reissued).

## CLARIFICATIONS

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- A. A listing of responses to questions from Contractors and Suppliers is included with this Addendum. (See Attachments).

1. Note: The attached Question and Answer Summary is not a part of the Addendum itself. Items that require changes in the Contract Documents must be submitted in writing to the Architect to be addressed formally by Addendum. The responsibility is to the bidders to seek formal resolution to its questions, from the designer, and failure to do so will not by default permit the bidder to rely upon the question and answer summary mentioned above.

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**REVISIONS TO DIVISION 00 PROCUREMENT REQUIREMENTS AND CONTRACTING REQUIREMENTS**

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- A. Replace DOCUMENT 003132 – GEOTECHNICAL REPORT, with revise Document 003132 with Test Report, included in the Attachments.
  1. Reissued with attachment of Test Pits report.
- B. Replace DOCUMENT 004113 – BID FORM with revised Document 004113 (previously reissued via Addendum No. 2), included in the Attachments.
  1. Revised to correct dates for phase 3
  2. Revised to correct section numbering of Bid Form attachments.
- C. Replace DOCUMENT 006000- PROJECT FORMS with revised Document 006000, included in the Attachments.
  1. Revised to correct project information in document headers.
- D. Add DOCUMENT 007300 – SUPPLEMENTARY CONDITIONS, included in the Attachments.

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**REVISIONS TO DIVISION 01 GENERAL REQUIREMENTS**

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- A. Replace SECTION 012300 – ALTERNATES with revised Section 012300, included in the Attachments.
  1. Revised description for Alternate No. 4.

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**REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS**

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- A. Add SECTION 088853 – SECURITY GLAZING, included in the Attachments.
- B. Replace SECTION 087100 – DOOR HARDWARE with revised Section 087100, included in the Attachments.
  1. Revised Door Hardware Schedule.

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- C. Replace SECTION 123553 – LABORATORY CASEWORK with revised Section 123553, included in the Attachments.
1. Various revisions throughout.
- D. SECTION 281000 – ACCESS CONTROL (not reissued); Make the following revisions:
1. Paragraph 1.1.C: Revise to read as follows:  
“C. Readers (Multiclass with OSDP capability).
- E. Replace SECTION 311000 – SITE CLEARING AND EROSION CONTROL, included in the Attachments.
1. Revised to correct project information in document headers.
- F. Replace SECTION 312000 – EARTH MOVING with revised Section 312000, included in the Attachments.
1. Revised to correct project information in document headers.
- G. Replace SECTION 321216 – ASPHALT PAVING with revised Section 321216, included in the Attachments.
1. Revised to correct project information in document headers.
- H. Replace SECTION 321313 – CONCRETE PAVING with revised Section 321313, included in the Attachments.
1. Revised to correct project information in document headers.
- I. Replace SECTION 321400 – UNIT PAVING with revised Section 321400, included in the Attachments.
1. Revised to correct project information in document headers.
- J. Replace 321530 – AGGREGATE PAVING with revised Section 321530, included in the Attachments.
1. Revised to correct project information in document headers.
- K. Replace 321801 – TRACK AND FIELD LINE MARKINGS with revised Section 321801, included in the Attachments.
1. Revised to correct project information in document headers.
- L. Replace 321802 – FIELD EVENT MATERIALS with revised Section 321802, included in the Attachments.
1. Revised to correct project information in document headers.

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- M. Replace 323113 – CHAIN LINK FENCES AND GATES with revised Section 323113, included in the Attachments.
1. Revised to correct project information in document headers.
- N. Replace 323119 – DECORATIVE METAL FENCES AND GATES with revised Section 323119, included in the Attachments.
1. Revised to correct project information in document headers.
- O. Replace 323223 – SEGMENTAL RETAINING WALLS with revised Section 323223, included in the Attachments.
1. Revised to correct project information in document headers.
- P. Replace 328400 – IRRIGATION SYSTEM with revised Section 328400, included in the Attachments.
1. Revised to correct project information in document headers.
- Q. Replace 329200 – TURF AND GRASSES with revised Section 329200, included in the Attachments.
1. Revised to correct project information in document headers.
- R. Replace 329300 – PLANTS with revised Section 329300, included in the Attachments.
1. Revised to correct project information in document headers.
- S. Replace 331100 – WATER DISTRIBUTION SYSTEM with revised Section 331100, included in the Attachments.
1. Revised to correct project information in document headers.
- T. Replace 333100 – GRAVITY FLOW SANITARY SEWERAGE SYSTEM with revised Section 333100, included in the Attachments.
1. Revised to correct project information in document headers.
- U. Replace 334100 – STORM DRAINAGE SYSTEM with revised Section 334100, included in the Attachments.
1. Revised to correct project information in document headers.
- V. Replace 334600 – SUBDRAINAGE with revised Section 334600, included in the Attachments.
1. Revised to correct project information in document headers.

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**ADDITIONAL ACCEPTABLE MANUFACTURERS**

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- A. The following is a list of manufacturers that have been approved for this Project, providing they can comply with the Specifications and are of equal or greater quality, and function and perform like the specified products. Inclusion to the list of acceptable manufacturers does not eliminate the necessity to comply with specifications. Non-compliant manufacturers and products will be rejected regardless of manufacturer being listed.

SECTION 116623 – GYMNASIUM EQUIPMENT:  
Basketball Equipment: Forum Athletic Products.

SECTION 116653 – GYMNASIUM DIVIDERS:  
Roll-Up Divider Systems: Forum Athletic Products.

SECTION 123553 – LABORATORY CASEWORK:  
Wood Laboratory Casework: Mott Manufacturing.

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**REVISIONS TO DRAWING SHEETS**

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- A. Replace SHEET C1.0 – TITLESHEET with revised Sheet C1.0, included in the Attachments.
- B. Replace SHEET C1.1 – LEGEND & REVISION NOTES with revised Sheet C1.1, included in the Attachments.
- C. Replace SHEET C3.2 – E&SC PHASE 3 with revised Sheet C3.2, included in the Attachments.
1. Show updated grading of wall along E Garrison and the truck loading dock area.
- D. Replace SHEET C3.3 – E&SC PHASE 4 with revised Sheet C3.3, included in the Attachments.
1. Show updated grading of wall along E Garrison and the truck loading dock area.
- E. Replace SHEET C3.4 – E&SC PHASE 5 with revised Sheet C3.4, included in the Attachments.
1. Show grading changes on an overall scale (Wall Adjustment and Loading Dock).
- F. Replace SHEET C4.0 – SITE PLAN with revised Sheet C4.0, included in the Attachments.
1. Landscape buffer label updated remove fence.
  2. Added concrete pad under football bleacher.
  3. Updated hatch for football stadium visitor side concrete pad to be heavy duty concrete to be coordinated with structural engineer.
  4. Retaining wall along Garrison Boulevard shifted.
  5. Legend updated with color coordinated linetypes for fence types and heights.
- G. Replace SHEET C5.0 – DRAINAGE PLAN with revised Sheet C5.0, included in the Attachments.

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1. Show updated callouts for trench drains and update connection points for the track trench drain.
- H. Replace SHEET C5.7 – STORM DRAINAGE DETAILS with revised Sheet C5.7, included in the Attachments.
1. Sheet created and additional details added.
- I. Replace SHEET C5.8 – STORM DRAINAGE DETAILS with revised Sheet C5.8, included in the Attachments.
1. Sheet created and additional details added.
- J. Replace SHEET C5.10 – ROOF DRAINAGE PLAN with revised Sheet C5.10, included in the Attachments.
1. Show additional roof drainage pipes to pickup canopy drainage.
- K. Replace SHEET C6.0 – OVERALL GRADING PLAN with revised Sheet C6.0, included in the Attachments.
1. Show grading changes on an overall scale (Wall Adjustment and Loading Dock).
- L. Replace SHEET C6.2 – ENLARGED GRADING PLAN with revised Sheet C6.2, included in the Attachments.
1. Updated grading of proposed retaining wall located along E Garrison.
  2. Updated grading of proposed truck loading dock area.
- M. Replace SHEET C7.1 – SITE DETAILS with revised Sheet C7.1, included in the Attachments.
1. Updated Detail 1 to show dumpster enclosure wall and gate height.
  2. Removed Detail 3.
- N. Replace SHEET C7.3 – SITE DETAILS with revised Sheet C7.3, included in the Attachments.
1. Updated Detail 1 to clarify fence types and heights.
- O. Replace SHEET L1.0 – LANDSCAPE PLAN with revised Sheet L1.0, included in the Attachments.
1. Revised canopy and understory tree locations by shifted retaining wall along Garrison Boulevard.
  2. Seed hatch updated to go up to retaining wall.
- P. Replace SHEET L1.2 – LANDSCAPE SCHEDULE, DETAILS & NOTES with revised Sheet L1.2, included in the Attachments.
1. Updated plant schedule for seeding.

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- Q. Replace SHEET S-211 – 2ND FLOOR FRAMING PLAN – AREA A with revised Sheet S-211, included in the Attachments.
1. Revising the bent plate detail around the stairs at the guardrail.
- R. Replace SHEET S-212 – 2ND FLOOR FRAMING PLAN – AREA B with revised Sheet S-212, included in the Attachments.
1. Revising the bent plate detail around the stairs at the guardrail.
- S. Replace SHEET S-401 – FRAMING SECTIONS & DETAILS with revised Sheet S-401, included in the Attachments.
1. Revising the bent plate detail around the stairs at the guardrail.
- T. Replace SHEET A-001.C – ARCHITECTURAL SITE PLAN – FINAL with revised Sheet A-001.C, included in the Attachments.
1. Alt 4 synthetic running track.
- U. Replace SHEET A-100C – BASEMENT FLOOR PLAN AREA C with revised Sheet A-100C, included in the Attachments.
1. Bathroom enlarged plans added, window and wall tags added.
- V. Replace SHEET A-101A – FIRST FLOOR PLAN AREA A with revised Sheet A-101A, included in the Attachments.
1. Exceptional suite A101 door numbers revised; ISS room 133 window tag added.
- W. Replace SHEET A-121B – FIRST FLOOR REFLECTED CEILING PLAN – AREA B with revised Sheet A-121B, included in the Attachments.
1. Cafeteria ACT changed.
- X. Replace SHEET A-122B – SECOND FLOOR REFLECTED CEILING PLAN – AREA B with revised Sheet A-122B, included in the Attachments.
1. Cafeteria ACT changed.
- Y. Replace SHEET A-402 – ENLARGED PLAN – RESTROOMS with revised Sheet A-402, included in the Attachments.
1. Basement bathrooms enlarged.
- Z. Replace SHEET A-510 – SECTION DETAILS with revised Sheet A-510, included in the Attachments.
1. Parapet wall coping has been revised (to remove steel angle).

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- AA. Replace SHEET A-601 – DOOR SCHEDULE BASEMENT & FIRST FLOOR with revised Sheet A-601, included in the Attachments.
1. Door A110A, A101B, YE01 & YE02 added.
- BB. Replace SHEET A-602 – DOOR SCHEDULE SECOND FLOOR, TYPE LEGEND & FRAME TYPES with revised Sheet A-602, included in the Attachments.
1. 2<sup>nd</sup> floor Collab 225F and 225G door added; door frame type J added.
- CC. Replace SHEET A-604 – ALUMINUM STOREFRONT SCHEDULES & TYPE LEGEND with revised Sheet A-604, included in the Attachments.
1. Window types M and N added; window schedule revised (extra items removed).
- DD. Replace SHEET A-700 – INTERIOR ELEVATIONS – ADMINISTRATION SUITE with revised Sheet A-700, included in the Attachments.
1. Basement casework elevation added.
- EE. Replace SHEET A-702 – INTERIOR ELEVATIONS – ENTRY LOBBY with revised Sheet A-702, included in the Attachments.
1. Acoustical panels retagged and coordinated with finish legend.
- FF. Replace SHEET A-704 – INTERIOR ELEVATIONS – BAND & CHORUS with revised Sheet A-704, included in the Attachments.
1. Acoustical panels retagged and coordinated with finish legend.
- GG. Replace SHEET A-705 – INTERIOR ELEVATIONS – MEDIA CENTER with revised Sheet A-705, included in the Attachments.
1. Acoustical panels retagged and coordinated with finish legend.
- HH. Replace SHEET A-706 – INTERIOR ELEVATIONS – CAFETERIA with revised Sheet A-706, included in the Attachments.
1. Acoustical panels retagged and coordinated with finish legend.
- II. Replace SHEET A-707 – INTERIOR ELEVATIONS – CAFETERIA with revised Sheet A-707, included in the Attachments.
1. Acoustical panels retagged and coordinated with finish legend.
- JJ. Replace SHEET A-710 – INTERIOR ELEVATIONS – GYM with revised Sheet A-710, included in the Attachments.
1. Dimensions added for AMP-1.

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- KK. Replace SHEET A-712 – FINISH LEGEND AND NOTES with revised Sheet A-712, included in the Attachments.
1. Spelling on CPT-2 corrected.
  2. RBS-1 color changed.
  3. CTW-2 size updated.
- LL. Replace SHEET A-714 – SECOND FLOOR AND BASEMENT FINISH SCHEDULE with revised Sheet A-714, included in the Attachments.
1. Basement finish schedule added.
- MM. Replace SHEET T-002 – TECHNOLOGY SYMBOLS with revised Sheet T-002, included in the Attachments.
1. Symbol description changed for 70-volt speakers, USB cable type revised.
- NN. Replace SHEET T-502 – TECHNOLOGY DETAILS with revised Sheet T-502, included in the Attachments.
1. USB cable type revised to match symbol legend changes.
- OO. Replace SHEET T-702 – TECHNOLOGY RISER DIAGRAMS with revised Sheet T-702, included in the Attachments.
1. Intercom riser modified.

END OF ADDENDUM NO 3

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DOCUMENT 003132 - GEOTECHNICAL DATA

## 1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.
- B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.
- C. A geotechnical investigation report for Project, prepared by ECS Southeast, LLP, dated November 4, 2021, is available for viewing as appended to this Document. **In addition, a data report of test pit observations for this Project, prepared by ECS Southeast, LLP, dated January 11, 2022, is available for viewing as appended to this Document.**
  - 1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
  - 2. Any party using information described in the geotechnical report shall make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.

END OF DOCUMENT 003132



January 11, 2022

Mr. Paul Nault  
Gaston County Schools  
943 Osceola Street  
Gastonia, North Carolina 28054

ECS Project No.: 08:14851-A

Reference: Data Report of Test Pit Observations  
**Garrison Tract**  
Gastonia, Gaston County, North Carolina

Dear Mr. Nault,

ECS Southeast, LLP (ECS) is pleased to submit this test pit observation data report for the above referenced site in Gastonia, North Carolina. Our services were performed in general accordance with our Proposal No. 08:26992P dated November 10, 2022. This data report presents the results of the supplemental field exploration and excavation characteristics of the materials encountered.

**PROJECT INFORMATION**

The project site is located at 1622 East Garrison Boulevard in Gastonia, Gaston County, North Carolina. The approximate 24.69-acre site is identified as Gaston County Parcel ID Number (PIN) 110018. Existing site conditions includes the William P. Grier Middle School, which is comprised of multiple structures, associated paved parking and drive areas, an outdoor track and field facility, and a baseball field. We understand that the site may be redeveloped with a school campus consisting of 1 to 2-story structures, paved parking and drive areas, and assorted amenities similar to the existing development. A formal site layout or grading plan was not provided to us at the time of this data report.

**PREVIOUS SUBSURFACE EXPLORATION**

ECS previously performed a preliminary subsurface exploration which included fifteen (15) Standard Penetration Test borings as outlined in our "Report of Preliminary Subsurface Exploration – Garrison Tract" (ECS Project No. 08:14851) dated November 4, 2021. The additional test pit information presented herein is intended to be used in conjunction with the subsurface exploration and recommendations provided in our previous report.

**SUPPLEMENTAL EXPLORATION PROCEDURES**

Our scope of services for this additional exploration included the observation of test pit excavations and preparation of this data report. Thirteen (13) test pits were excavated to depths ranging from approximately 4 to 20 feet below the existing ground surface using a Kobelco SK-160LC excavator. Approximate test pit locations are shown on the attached Test Location Diagram. The general test pit focus areas/locations were based on the anticipated building location from the provided preliminary conceptual site sketch.

During excavation of the test pits, an ECS staff professional visually classified each soil sample on the basis of color, texture, and plasticity characteristics in general accordance with the Unified Soil Classification System (USCS). The staff professional grouped the various soil types into the major zones noted on the Test Pit Observation Summary Logs. The stratification lines designating the interfaces between earth materials on the Test Pit Observation Summary Logs are approximate; in situ, the transition between strata may be gradual in both the vertical and horizontal directions.

### SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered by the test pits are shown on the logs and photographs attached to this report. These logs represent our interpretation of the subsurface conditions based upon field data.

The subsurface conditions disclosed by the test pits generally consisted of surficial organic laden soil underlain by existing fill soils, residual soils, possible Partially Weathered Rock (PWR), and equipment refusal materials.

- Existing fill was encountered at Test Pits TP-1 through TP-5, TP-9, TP-10, TP-11, and TP-13 to depths ranging from approximately 1.5 to 16 feet below existing grades. Additionally, boulder sized rock was encountered within the fill material at Test Pits TP-2, TP-10, and TP-13.
- Residual soils were encountered in each of the test pits with the exception of TP-13. The residual soils generally consisted of Lean CLAY (CL), Sandy SILT (ML), Elastic SILT (MH), Silty SAND (SM), and Clayey SAND (SC) at depths ranging from approximately 0.3 to 20 feet below existing grades.
- Excavation equipment refusal was encountered in Test Pits TP-1, TP-3, TP-5, TP-6, and TP-7 at depths ranging from approximately 4 to 12.5 feet below existing grades within possible PWR. Test Pit TP-13 was terminated in existing fill at a depth of approximately 10 feet.

The subsurface conditions encountered in the test pits generally appeared similar to those encountered in the previously performed soil test borings. The observed test pit equipment refusal depths during this additional exploration are summarized in the following table.

SUMMARY OF TEST PIT REFUSAL DEPTHS			
Location	Test Pit Equipment Refusal Depth (ft)	Location	Test Pit Equipment Refusal Depth (ft)
TP-1	12.5	TP-8	-
TP-2	-	TP-9	-
TP-3	6.5	TP-10	-
TP-4	-	TP-11	-
TP-5	4	TP-12	-
TP-6	4	TP-13	10*
TP-7	5		

As noted in our previous report, the weathering process in the Piedmont Geology can be erratic and significant variations of the depths of the more dense materials can occur in relatively short distances. In some cases, isolated boulders or thin rock seams may be present in the soil matrix.

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**CLOSING**

It has been our pleasure to be of service to you on of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase and construction operations. Should you have any questions concerning the information contained in this data report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

**ECS Southeast, LLP**

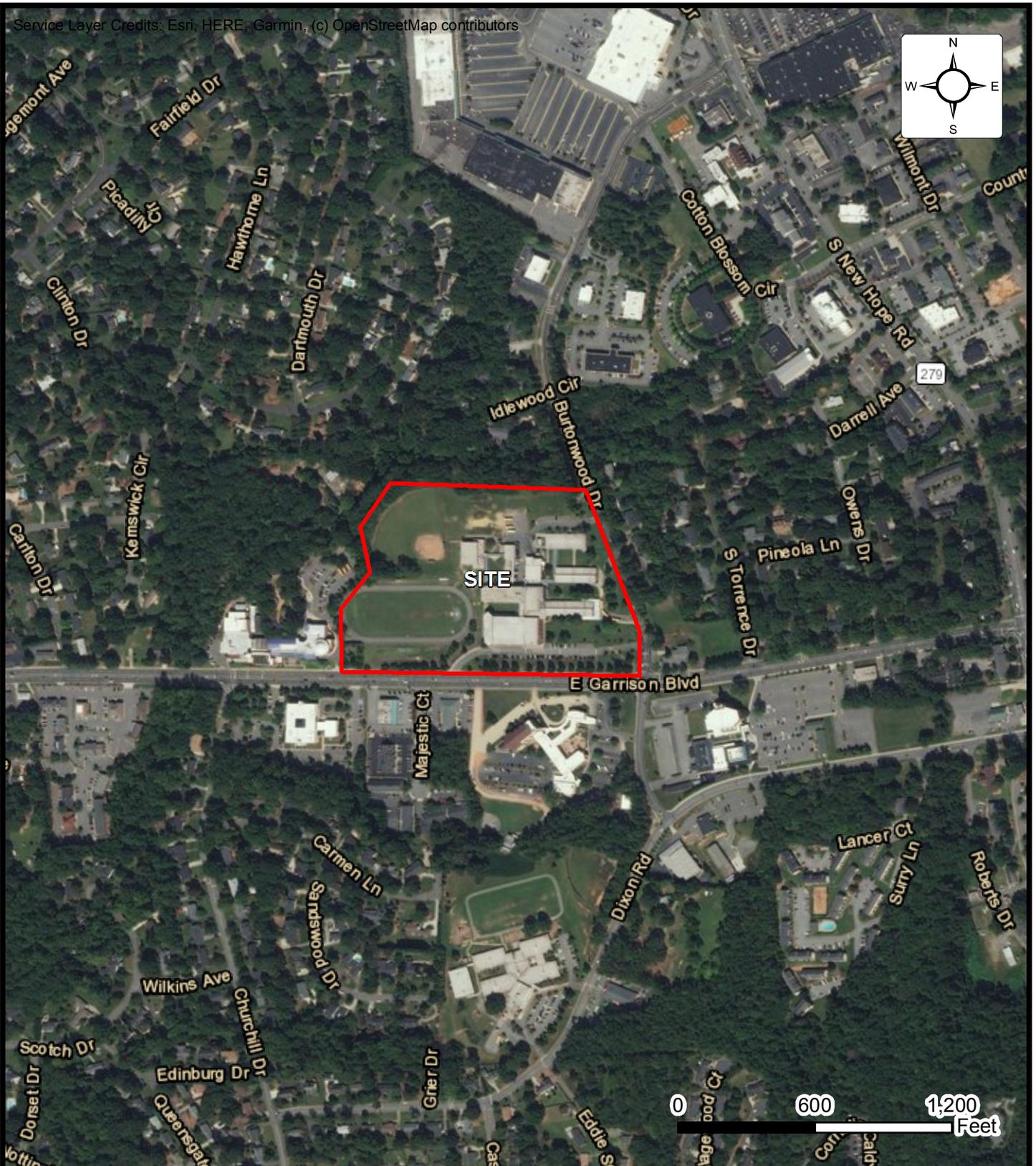


**Alexander W. Tax, E.I.**  
Geotechnical Project Manager  
[ATax@ecslimited.com](mailto:ATax@ecslimited.com)



**Walid M. Sobh, P.E.**  
Principal Engineer  
[WSobh@ecslimited.com](mailto:WSobh@ecslimited.com)

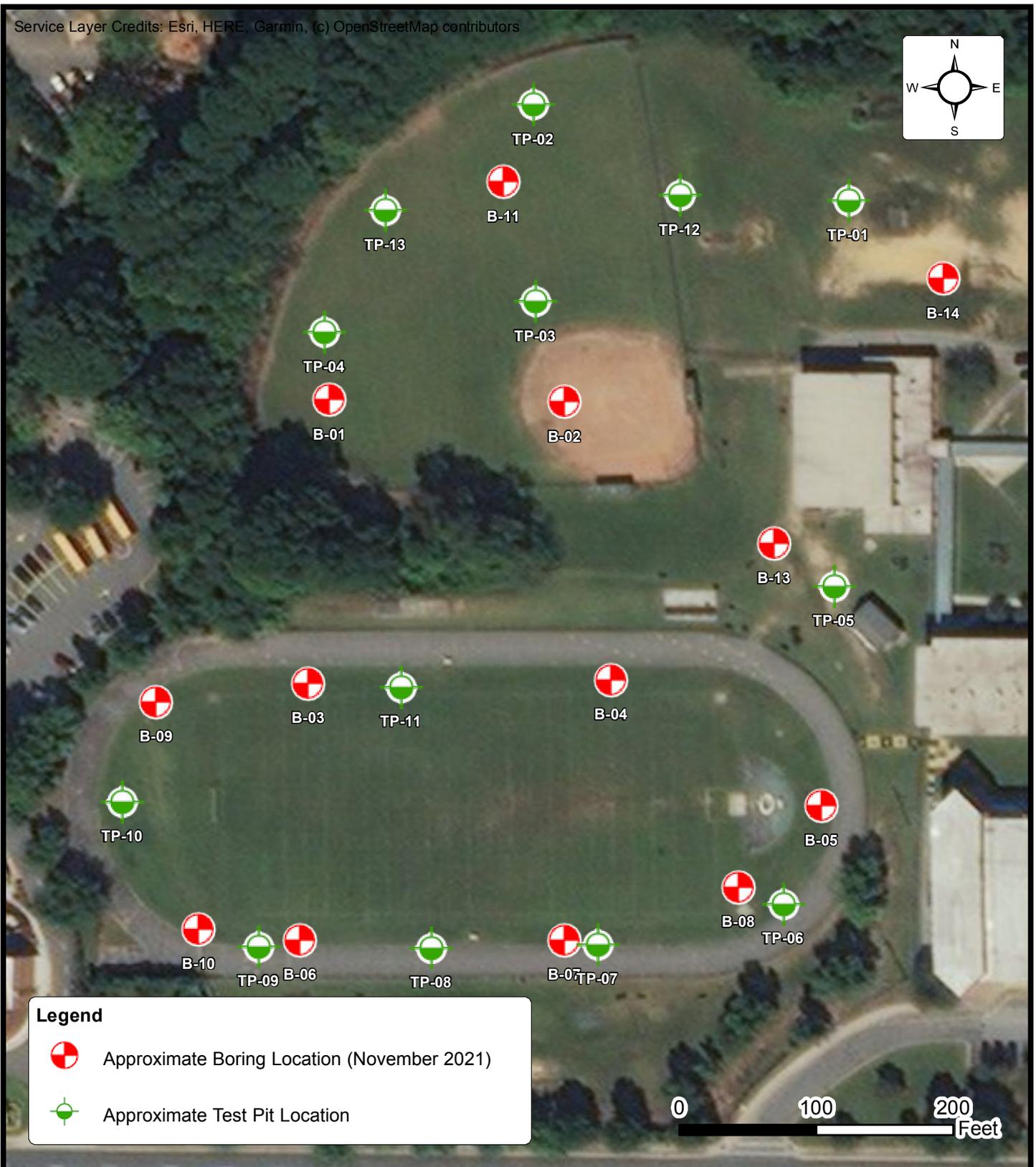
**ATTACHMENTS:**      Figure 1: Site Location Diagram  
                                 Figure 2: Test Location Diagram  
                                 Test Pit Observation Summary (TP-1 through TP-13)



# SITE LOCATION DIAGRAM GARRISON TRACT

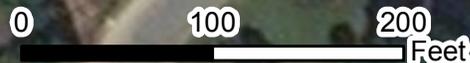
GASTONIA, NORTH CAROLINA  
GASTON COUNTY SCHOOLS

ENGINEER WMS
SCALE AS NOTED
PROJECT NO. 08:14851-A
FIGURE 1
DATE 1/11/2021



**Legend**

- Approximate Boring Location (November 2021)
- Approximate Test Pit Location



# TEST LOCATION DIAGRAM GARRISON TRACT

GASTONIA, NORTH CAROLINA

GASTON COUNTY SCHOOLS

ENGINEER WMS
SCALE AS NOTED
PROJECT NO. 08:14851-A
FIGURE 2
DATE 1/11/2022



TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-1

Test Pit Elevation: 784 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From/To, Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 12.5 feet depth, including Organic Laden Soil, (SM FILL) SILTY SAND, (CL RESIDUAL) LEAN CLAY, (SC) CLAYEY SAND, and (SM) SILTY SAND.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-2

Test Pit Elevation: 771 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From/To, Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 20 feet depth, including Organic Laden Soil, (ML FILL) SANDY SILT, and (SC RESIDUAL) CLAYEY SAND.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-3

Test Pit Elevation: 773 feet

Date of Observation: December 16, 2021

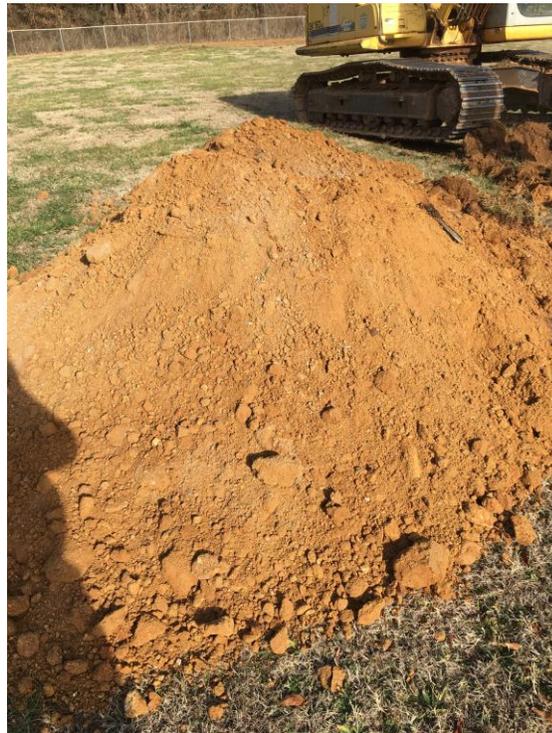
EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From/To, Soil Description, and Excavation Effort. Rows include Organic Laden Soil, (ML FILL) SANDY SILT, (ML RESIDUAL) SANDY SILT, (SM) SILTY SAND, and Equipment refusal at 6.5 feet.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-4

Test Pit Elevation: 771 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 3 columns: Depth (ft.) (From/To), Soil Description, and Excavation Effort. Rows include soil types like Organic Laden Soil, (ML FILL) SANDY SILT, (MH RESIDUAL) ELASTIC SILT, (ML) SANDY SILT, (SM) SILTY SAND, and Test Pit terminated at 20 feet.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-5

Test Pit Elevation: 791 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 3 columns: Depth (ft.) (From/To), Soil Description, and Excavation Effort. Rows include soil types like Organic Laden Soil, (ML FILL) SANDY SILT, (SM RESIDUAL) SILTY SAND, and (SM) SILTY SAND.

Water Depth: Not Observed





**TEST PIT OBSERVATION SUMMARY**

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-6

Test Pit Elevation: 790 feet

Date of Observation: December 16, 2021

**EXCAVATION EQUIPMENT:**

Type:  Rubber Tire Backhoe  Trackhoe  Front End Loader  Other: \_\_\_\_\_  
Manufacturer: Kobelco Model No.: SK-160LC

**TEST PIT SOIL CLASSIFICATION:**

Depth (ft.)		Soil Description	Excavation Effort
From:	To:		
0	0.3	Organic Laden Soil	Easy
0.3	1.5	(SM RESIDUAL) SILTY SAND, orangish brown, moist	Difficult
1.5	4	(SM) SILTY SAND, possible partially weathered rock, contains cobble to boulder sized rock fragments, grayish white, moist	Very Difficult
4	-	Equipment refusal at 4 feet	

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-7

Test Pit Elevation: 790 feet

Date of Observation: December 16, 2021

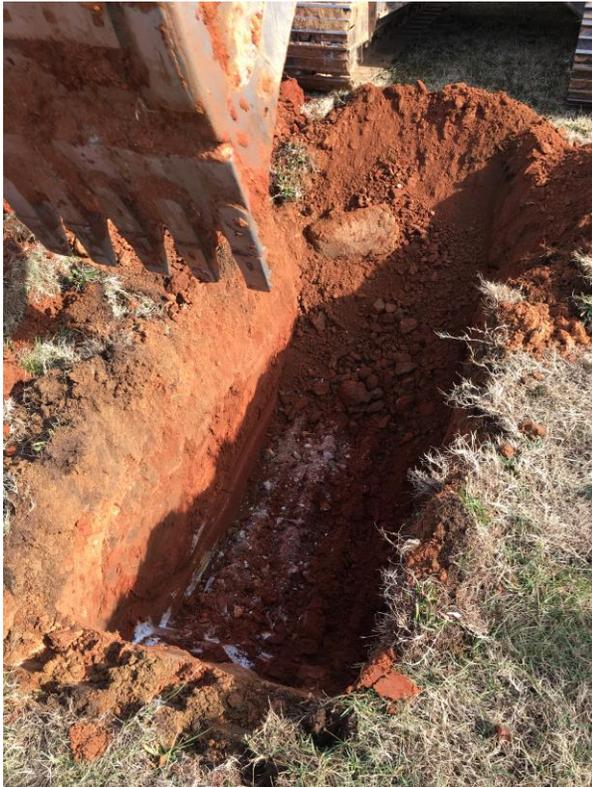
EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 3 columns: Depth (ft.) (From/To), Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 5 feet depth, including organic soil, silty sand, and equipment refusal.

Water Depth: Not Observed







TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract
ECS Project #: 08:14851-A
Project Location: Gastonia, NC
ECS Technician: A. Tax
Project Client: Gaston County Schools
Excavation Subcontractor: Abernethy
Test Pit No.: TP-9
Test Pit Elevation: 790 feet
Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: Rubber Tire Backhoe, Trackhoe, Front End Loader, Other
Manufacturer: Kobelco
Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From, Depth (ft.) To, Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 20 feet depth.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-10

Test Pit Elevation: 790 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 3 columns: Depth (ft.) (From/To), Soil Description, and Excavation Effort. Rows include soil types like Organic Laden Soil, (ML FILL) SANDY SILT, (ML RESIDUAL) SANDY SILT, and (SM) SILTY SAND.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract
Project Location: Gastonia, NC
Project Client: Gaston County Schools
Test Pit No.: TP-11
Date of Observation: December 16, 2021
ECS Project #: 08:14851-A
ECS Technician: A. Tax
Excavation Subcontractor: Abernethy
Test Pit Elevation: 790 feet

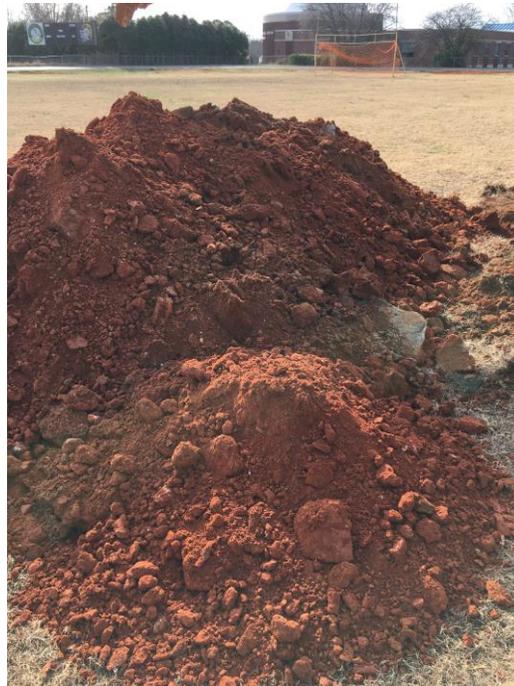
EXCAVATION EQUIPMENT:

Type: Rubber Tire Backhoe, Trackhoe, Front End Loader, Other
Manufacturer: Kobelco
Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From, Depth (ft.) To, Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 20 feet depth.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-12

Test Pit Elevation: 774 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type: [ ] Rubber Tire Backhoe [x] Trackhoe [ ] Front End Loader [ ] Other:
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Table with 4 columns: Depth (ft.) From/To, Soil Description, and Excavation Effort. Rows describe soil layers from 0 to 20 feet depth.

Water Depth: Not Observed





TEST PIT OBSERVATION SUMMARY

Project Name: Garrison Tract

ECS Project #: 08:14851-A

Project Location: Gastonia, NC

ECS Technician: A. Tax

Project Client: Gaston County Schools

Excavation Subcontractor: Abernethy

Test Pit No.: TP-13

Test Pit Elevation: 771 feet

Date of Observation: December 16, 2021

EXCAVATION EQUIPMENT:

Type:  Rubber Tire Backhoe  Trackhoe  Front End Loader  Other: \_\_\_\_\_  
Manufacturer: Kobelco Model No.: SK-160LC

TEST PIT SOIL CLASSIFICATION:

Depth (ft.)		Soil Description	Excavation Effort
From:	To:		
0	0.3	Organic Laden Soil	Easy
0.3	10	(ML FILL) SANDY SILT, brown and grayish white, moist, contains boulder sized rock fragments/blast rock	Very Difficult
10	-	Equipment refusal at 10 feet within possible fill	

Water Depth: Not Observed



DOCUMENT 004113 – BID FORM - STIPULATED SUM

1.1 BID INFORMATION

- A. Date: \_\_\_\_\_
- B. Bidder: \_\_\_\_\_.
- C. Bidder’s Contractor License Number: \_\_\_\_\_
- D. Bidder: \_\_\_\_\_  
(Name of firm or company submitting Bid)  
 \_\_\_\_\_  
(Address of firm or company submitting Bid)  
 \_\_\_\_\_  
(City, State, Zip Code)  
 \_\_\_\_\_  
(Contact Person, Telephone Number, Fax Number)
- E. Project Name: Gaston County Schools - Grier Middle School.
  - 1. Project Location: 1622 Garrison Boulevard, Gastonia, NC 28054.
- F. Owner: Gaston County Schools, 943 Osceola Street, Gastonia, NC 28053.
  - 1. Owner Contact: Paul Nault.
- G. Architect: LS3P ASSOCIATES LTD, 227 West Trade Street, Suite 700, Charlotte, NC 28202.
- H. Architect’s Project Number: 9201-218240.

1.2 CERTIFICATIONS AND BASE BID

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and subsequent Addenda, as prepared by LS3P and LS3P's consultants, and being familiar with all conditions and requirements of Work, hereby agrees to furnish all material, labor, equipment, and services necessary to complete construction of above-named Project, per requirements of Procurement and Contracting Documents, for stipulated Sum of:  
 \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).
- 1. The above amount may be modified by amounts indicated by the Bidder on the attached Document 004322 – Unit Prices Form and Document 004323 – Alternates Form.

- B. Bidder, in submitting this Bid, understands that Owner reserves the right to reject any or all Bids, to waive any informality or irregularity in any Bid received.

1.3 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 90 days after receipt of Bids, and on failure to do so agrees to forfeit to Owner the attached cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid amount above:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

- B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cashier's check, certified check, U.S. money order, or bid bond.

1.4 SUBCONTRACTORS AND SUPPLIERS

- A. The following companies shall execute subcontracts for the portions of the Work indicated:

	<u>Name of Company</u>	<u>License No.</u>
Masonry Subcontractor:	_____	_____
Roofing Subcontractor:	_____	_____
Plumbing Subcontractor:	_____	_____
HVAC Subcontractor:	_____	_____
Electrical Subcontractor:	_____	_____

- B. The Contractor shall act as Project Expediter.

1.5 TIME OF COMPLETION

- A. Work of this Contract will commence upon execution of Contract, and will be Substantially Complete no later than the following dates:
- B. The undersigned Bidder proposes and agrees hereby to commence Work of Contract Documents on the date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete Work by end of June 2025 for Phase 1 – construction of the new school building, and end of ~~July 2026~~ **November 2025** for Phase 2 – demolition of existing buildings and **end of July 2026** for Phase 3 – new athletic fields.

1.6 ACKNOWLEDGEMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

- 1. Addendum No. 1, dated \_\_\_\_\_.
- 2. Addendum No. 2, dated \_\_\_\_\_.
- 3. Addendum No. 3, dated \_\_\_\_\_.
- 4. Addendum No. 4, dated \_\_\_\_\_.

1.7 BID FORM SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto.

- 1. Document 004321 – ~~Unit Prices~~ **Allowances** Form.
- 2. Document 004322 – ~~Allowances~~ **Unit Prices** Form.
- 3. Document 004323 - Alternates Form.

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for type of work proposed, in the State of North Carolina, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 SUBMISSION OF BID

Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2023.

Submitted By: \_\_\_\_\_  
(Name of bidding firm or corporation)

Authorized Signature: \_\_\_\_\_  
(Handwritten signature)

Signed By: \_\_\_\_\_  
(Type or print name)

Title: \_\_\_\_\_  
(Owner/Partner/President/Vice President)

Witness By: \_\_\_\_\_  
(Handwritten signature)

Attest: \_\_\_\_\_  
(Handwritten signature)

By: \_\_\_\_\_  
(Type or print name)

Title: \_\_\_\_\_  
(Corporate Secretary or Assistant Secretary)

Street Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

License No.: \_\_\_\_\_

Federal ID No.: \_\_\_\_\_ (Affix Corporate Seal Here)

END OF DOCUMENT 004113

## DOCUMENT 006000 – PROJECT FORMS

## PART 1 - GENERAL

## 1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS

- A. The following form of Owner/Contractor Agreement and form of the General Conditions shall be used for Project:
1. AIA Document A101–2017, Standard Form of Agreement between Owner and Contractor, Stipulated Sum.
    - a. The General Conditions for Project are AIA Document A201–2017, General Conditions of the Contract for Construction.
- B. Contractor is hereby specifically directed, as a condition of the Contract, to obtain necessary number of copies of AIA Document A201–2017 to acquaint themselves with the Articles contained therein and to notify and apprise Subcontractors, suppliers, and other parties to the Contract or individuals or agencies engaged on Work as to its contents.
- C. No contractual adjustment shall be due or requested as a result of failure on part of Contractor to fully acquaint themselves and other parties to the Contract with conditions of AIA Document A201.

## 1.2 ADMINISTRATIVE FORMS

- A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.
- B. Copies of AIA Documents may be reviewed at Architect's office or obtained by one of the following methods:
1. AIA website: <http://www.aia.org/contractdocs/index.htm>.
- C. Preconstruction Forms:
1. Form of Bid Bond: AIA Document A310–2010, Bid Bond.
  2. Form of Performance Bond and Labor and Material Bond: AIA Document A312–2010, Performance Bond and Payment Bond.
  3. Form of Certificate of Insurance: AIA Document G715–2017, Supplemental Attachment for ACORD Certificate of Insurance 25-S.
- D. Information and Modification Forms:
1. Form for Requests for Information (RFIs): Document 006313 – Request for Information Form, included in these Specifications, or AIA Document G716–2004, Request for Information (RFI).

- 
2. Form of Request for Proposal: AIA Document G709–2018, Work Changes Proposal Request.
  3. Change Order Form: AIA Document G701–2017, Change Order.
  4. Form of Architect's Memorandum for Minor Changes in the Work: AIA Document G710–2017, Architect's Supplemental Instructions.
  5. Form of Change Directive: AIA Document G714–2017, Construction Change Directive.

E. Payment Forms:

1. Schedule of Values Form: AIA Document G703–1992, Continuation Sheet.
2. Payment Application: AIA Document G702/703–1992, Application and Certificate for Payment and Continuation Sheet.
3. Form of Contractor's Affidavit: AIA Document G706–1994, Contractor's Affidavit of Payment of Debts and Claims.
4. Form of Affidavit of Release of Liens: AIA Document G706A–1994, Contractor's Affidavit of Payment of Release of Liens.
5. Form of Consent of Surety: AIA Document G707–1994, Consent of Surety to Final Payment.
6. Form of Consent of Surety: AIA Document G707A–1994, Consent of Surety to Final Reduction in or Partial Release of Retainage.

F. Substantial Completion Forms:

1. Form of Substantial Completion: AIA Document G704–2017, Certificate of Substantial Completion.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 006000

## DOCUMENT 007300 – SUPPLEMENTARY CONDITIONS

The following supplements modify, change, delete from, or add to the "General Conditions of the Contract for Construction," AIA Document A201, 2017 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered provisions of the General Conditions shall remain in effect.

## 1.1 ARTICLE 1 GENERAL PROVISIONS

## A. §1.1 BASIC DEFINITIONS

## B. §1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1. **§1.2.1 Add the following:**

2. In the event of inconsistencies and/or discrepancies between or within Contract Documents, the Contractor shall provide the better quality or greater quantity and shall comply with the more stringent requirements, and either or both in accordance with the Architect's interpretation. The Contractor shall bring all inconsistencies and/or discrepancies to the Architect's attention for the Architect's interpretation prior to installation.

3. **§1.2.1 Add the following:**

- a. **§1.2.1.1** By signing the Agreement and entering in to a contract for construction of this Project the Contractor acknowledges and agrees that the Contract Documents are sufficient to provide for the completion of the Work, including Work, whether or not shown or described, which may reasonably be inferred to be required for the completion of the Work in accordance with information given in the Contract Documents.

4. **Add the following Sections and Subsections:**

- a. **§1.2.4** If there should be a conflict between two or more of the Contract Documents, the Architect shall apply the following priorities in issuing an interpretation:
- b. **§1.2.4.1** Where requirements specifically set forth in the Owner-Contractor Agreement are in conflict with other Contract Documents, the Owner- Contractor Agreement shall govern.
- c. **§1.2.4.2** Where there is a conflict between the requirements of the General Conditions of the Contract and the Supplementary Conditions, the requirements of the Supplementary Conditions shall govern, except where the requirements set forth in the Supplementary Conditions are contrary to law, in which case the legal requirements shall govern. The General Conditions of the Contract shall take precedence over other Contract Documents except for the Owner-Contractor Agreement.
- d. **§1.2.4.3** Where there is a conflict between the Drawings and Specifications or a conflict within the Drawings or within the Specifications, the conflict shall be brought to the attention of the Architect for resolution.
- e. **§1.2.5** Administrative and procedural requirements related to the General Conditions and these Supplementary Conditions are found in Division 01 General Requirements.

**ARTICLE 2 OWNER**

## C. §2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

**§2.3.1 Delete last sentence.**

1. **§2.3.4 Delete §2.3.4 and substitute the following:**

2. **§2.3.4** The Owner shall furnish surveys describing physical characteristics, legal limitations and approximate utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner, provided that the Contractor has diligently reviewed the information and has informed the Owner in writing if it has actual knowledge of incorrect information. The Contractor shall exercise proper precautions relating to the safe performance of the Work.

3. **Add the following:**

- a. **§2.3.6** The Owner will procure and bear costs of initial special inspections as required by authorities having jurisdiction. Contractor shall bear costs of re-inspection of non-compliant Work.

D. **§2.5 OWNER'S RIGHT TO CARRY OUT THE WORK**

1. **Add the following:**

**§2.5** (*add tag to the beginning of the first paragraph and change "ten-day period" to "seven-day period" in first sentence.*)

**§2.5.2** The Owner may declare the Contractor in default for any one or more of the following reasons:

- .1 failure to complete the Work within the Contract Time or any extension thereof;
- .2 failure or refusal to comply with an order of the Architect within a reasonable time;
- .3 failure or refusal to remove rejected materials within 30 days;
- .4 failure or refusal to perform anew any defective or unacceptable Work;
- .5 failure to provide a qualified superintendent, competent workers or subcontractors to carry on the Work in an acceptable manner;
- .6 failure to prosecute the Work according to the agreed schedule of completion;
- .7 disregard or violation of any provision of the Contract Documents;
- .8 if the Contractor abandons the Project for 10 or more days;
- .9 failure to promptly pay subcontractors and material suppliers in a timely manner.

**ARTICLE 3 CONTRACTOR**

**§3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

**§3.2.2** *Revise to read as follows:* Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to **§2.3.4**, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect, **with a copy to the Owner**, any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. However, except as the parties may agree in writing signed by each, the Contractor shall not perform any Work

knowing it to contain an error, or perform Work at any time without Contract Documents or, where required, approved Shop Drawings, Product Data or samples for such portions of the Work.

**§3.2.3 Revise to read as follows:** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect, **with a copy to the Owner**, any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

**§3.2.4 to the end of the paragraph add:**

The provisions of this Article are subject to the provisions of **Article 15**, which shall control in the event of any inconsistency, including the time period for providing notices of Claims and submission of Claims.

2. **Add the following:**

**§3.2.5** The Contractor shall verify to the best of its ability all existing grades, levels, known conditions and dimensions and shall make all necessary measurements at the Project site. Any discrepancies or differences shall be promptly reported to the Owner in writing prior to completing the affected Work.

**§3.3 SUPERVISION AND CONSTRUCTION PROCEDURES**

**§3.3.1 Revise to read as follows:** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the **Contractor shall not be** responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

3. **Add the following:**

- a. **§3.3.4** The Contractor shall participate in periodic progress meetings conducted by the Architect. The Contractor shall be represented at these meetings by the Contractor's project manager and superintendent. These representatives shall have authority to act on behalf of the Contractor.
- b. **§3.3.5** The Contractor shall be responsible for coordinating and overseeing any and all special inspections or special inspectors that may be required for the Project under any applicable rules, law, regulations, codes or governmental provisions without any addition to or increase in the Contract Sum, the Guaranteed Maximum Price or Contract Time. Coordinating and overseeing special inspections is within the scope of work under this Agreement.

E. **§3.4 LABOR AND MATERIALS**

1. **§3.4.2 Delete §3.4.2 and substitute the following:**

- a. **§3.4.2** After the Contract has been executed, the Owner and Architect will consider a formal request for the substitution of products in place of those specified only under the conditions and limitations set forth in Division 01 General Requirements. By making requests for substitutions, the Contractor:

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- b. **§3.4.2.1** represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified, except as specifically indicated by the Contractor;
  - c. **§3.4.2.2** represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
  - d. **§3.4.2.3** certifies that the cost data presented is complete and includes all related effected by the change under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
  - e. **§3.4.2.4** will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
  - f. **§3.4.2.5** The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to evaluate Contractor's proposed substitutions when those substitutions are for the Contractor's convenience or benefit, and to make agreed-upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions. Architect's evaluation fee shall be not less than \$500.00 per request, based upon the Architect's current hourly fee agreement with the Owner.

F. **§3.6 TAXES**

1. **Add the following:**

- a. **§3.6.1** Sales and use tax on materials is included in the Contract Sum. The Contractor shall document sales and use tax paid by the Contractor on material purchases, as required by the Owner. The Contractor shall submit certified documentation with each Application for Payment in a notarized form acceptable to the Owner. Refund of sales and use tax paid by the Contractor, if any, shall be for the benefit of the Owner.

G. **§3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS**

1. **§3.7.1 Add the following:**

- a. **§3.7.1.1** The Contractor shall pay fees for public or private water, gas, electrical, and other utility extensions at the site. The Contractor shall secure and arrange for all necessary utility connections.

H. **§3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES**

1. **§3.10.1 Add the following:**

- 2. The Project schedule, and any revisions thereto, shall not become Contract Documents, and the required dates for completion of the Work hereunder shall not be deemed modified by the modification to, or approval of, any schedule or revised schedule developed on the Project, as the completion dates may only be modified by written Change Order.

3. **§3.10.3 Add the following:**

- a. **§3.10.3.1** If the progress of the Work is delayed through the fault, neglect, act or failure to act on the part of the Contractor, then the Contractor shall, at no cost or expense to the Owner, make such adjustments to the Contractor's construction schedule, and proceed immediately to employ additional labor, work such overtime, or make such other adjustments to the means and methods of construction, as may be necessary to bring the work back in compliance with the construction schedule and to avoid delay in the completion of the Work.

**§3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

4. **Add the following:**

5. **§3.12.11** With regard to new equipment, materials, and products (collectively "Products") required by the Architect's construction documents, it is understood the Architect is relying on stated and implied representations made by manufacturers, suppliers and installers of such Products as being suitably fit for their intended purposes. The Architect is not responsible for the Product's failure to perform consistently with those representations.

### **§3.18 INDEMNIFICATION**

6. **§3.18.1 Add the following:**

7. Contractor's liability insurance shall be primary as to any coverage maintained by the Owner. Such indemnification shall survive the fulfillment or termination of this Agreement and shall insure to and/or burden the heirs, assigns, and/or successors of the parties hereto.

8. **Add the following:**

**§3.18.3** Notwithstanding anything to the contrary in the Contract Documents, Contractor shall be responsible to Owner for claims, lawsuits, liability and damages arising out of or related to mold, airborne microorganisms or the quality of air within the Project to the extent that such claim, lawsuit, liability or damage is caused by Contractor's negligence or failure to install the Work in accordance with the Specifications and Drawings or failure to protect the existing conditions.

## **ARTICLE 4 ARCHITECT**

### **§4.1 GENERAL**

9. **§4.1.2 Delete §4.1.2 and substitute the following:**

**§4.1.2** Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents may be reasonably restricted, modified or extended by the Owner upon written consent of the Architect. Consent shall not be unreasonably withheld. Such restriction, modification, or extension shall not be below the Professional Standard of Care of the Architect.

### **§4.2 ADMINISTRATION OF THE CONTRACT**

10. **§4.2.5 Add the following:**

All Payment Applications shall be subject to final approval by the Owner in accordance with the requirements of the Contract Documents, which shall not be unreasonably withheld.

11. **§4.2.6 Delete the second sentence of §4.2.6 and substitute the following:**

12. With the approval of the Owner, whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with **§13.4.2** and **§13.4.3**, whether or not such Work is fabricated, installed or completed.

13. **§4.2.9 Add the following:**

14. The Owner is entitled to approve the Date of Substantial Completion certified by the Architect, in accordance with the terms of the Contract Documents, which shall not be unreasonably withheld.

## **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

- I. **§6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS**

1. **Add the following:**

**§6.1.5** The Owner has the option of purchasing all or any portion of the materials and equipment to be used in the Project directly from the manufacturer or supplier in accordance with the following procedure:

- .1 The Contractor will provide the Owner with a complete list of equipment and materials included in its Contract, describing each item by manufacturer and model or part number where appropriate. The Owner will then promptly advise the Contractor which items the Owner will purchase directly. An appropriate number of the Owner's purchase requisition forms will be supplied to the Contractor. The Contractor will properly complete the forms and items to be purchased by the Owner. The Contractor is responsible for proper completion of purchase requisition forms. All equipment and materials so ordered will be paid for by the Owner. The Owner will receive credit against the Contract Sum in an amount equal to the gross invoice price of all equipment and materials so ordered.
- .2 The Contractor is not entitled to receive any additional compensation for the performance of duties outlined in this paragraph.
- .3 The Contractor accepts assignment of, and liability for, all purchase requisitions and other agreements for procurement of materials and equipment that are identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchase. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items, unless the Contract Documents specifically provide otherwise.

## **ARTICLE 7 CHANGES IN THE WORK**

### **§7.2 CHANGE ORDERS**

*Add §7.2.2 as Follows:*

**§7.2.2** An itemized cost breakdown for each change order shall be provided and shall include Contractors overhead and profit modifications based upon **§7.2.2.1** and **§7.2.2.2**.

**§7.2.2.1** The cost of the Contractors overhead and profit on any change order shall be:

- a) For extra Work completed by the Contractor with his own labor, not more than 15 percent shall be added as the allowance for overhead and profit.
- b) For extra Work completed by Subcontractors of the Contractor, not more than 10 percent shall be added as the allowance for overhead and profit.
- c) For Work deleted which would have been completed by the Contractor, with his own labor, not less than 10 percent shall be credited to the Owner as the allowance for overhead and profit.
- d) For Work deleted which would have been completed by Subcontractors of the Contractor, not less than 5 percent shall be credited to the Owner by the Contractor as the allowance for overhead and profit.

- J.** **§7.2.2.2** In order to facilitate checking of quotations for extras or credits, proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change be approved without such itemization."

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**ARTICLE 8 TIME****K. §8.1 DEFINITIONS****1. §8.1.2 Revise to read as follows:**

**§8.1.2** The date of commencement of the Work is the date established in the Agreement or the date established in the Notice to Proceed issued by the Owner.

**L. §8.3 DELAYS AND EXTENSION OF TIME****1. §8.3.1 Delete §8.3.1 and substitute the following:**

**M. §8.3.1** If the Contractor is delayed at any time in the commencement, prosecution or completion of the Work, or is obstructed, hindered or interfered with in the orderly progress of the Work by any act, neglect, interference, or default of the Owner, the Architect, any Construction Manager retained by the Owner, or by any employee, separate contractor or consultant of any of them, or by any cause beyond the control of the Contractor, then the Contract Time shall be equitably extended by a Change Order for the delay to the critical path activities of the Work only. Under no circumstances shall Contractor be entitled to any additional money for extended general conditions, duration related expenses, overhead or other costs, compensation or damages due to delay, hindrance, disruption, interference or inefficiency allegedly due to the acts or omissions of the Owner, the Architect, any Construction Manager retained by the Owner, or any agents, employees or separate contractor of any of the above.

**1. §8.3.2 Delete §8.3.2 and substitute the following:**

**§8.3.2** Claims relating to time shall be made in accordance with applicable provisions of **Article 15**. However, neither the Owner nor the Architect shall be liable for any failure or delay in performance under this Agreement (other than for delay in the payment of money due and payable hereunder) to the extent said failures or delays are caused by forces beyond that party's reasonable control and occurring without its fault or negligence including but not limited to natural disasters, wars, riots, fire, flood, landslide, tornado or other act of God, malicious mischief, theft, strike, lockout, other labor problems, shortage of material or labor, failure of any governmental agency, and/or performance failures of consultants, contractors, suppliers and/or carriers, failure of any governmental agency or Owner to furnish information or to approve or to disapprove the Architect's work or any other cause beyond the reasonable control of the Architect, provided that, as a condition to the claim of non-liability, the party experiencing the difficulty shall give the other party prompt written notice, with full details following the occurrence of the cause relied upon. Dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

**2. §8.3.2 Add the following:**

- a. **§8.3.2.1** Requests for extensions of the Contract Time due to unusual adverse weather conditions occurring will be evaluated by the Architect when submitted by the Contractor in accordance with the requirements of Division 01 General Requirements.
- b. **§8.3.2.2** Extensions of Contract Time due to unusual adverse weather conditions shall not entitle the Contractor to claims for cost due to extended project overhead.

**3. Add Section 8.4 CONTRACT TIME as follows:****N. §8.4 CONTRACT TIME**

- a. §8.4.1 The Contractor shall commence the Work on a date to be specified in the Agreement or in a Notice to Proceed issued by the Architect on behalf of the Owner; and shall complete the Work by the date indicated for completion of the Work, the resultant number of days constituting the Contract Time.

Substantial Completion: All work of each phase shall be substantially completed on or before the dates listed below:

Phase 1: June 2025

Phase 2: November 2025

Phase 3: July 2026

## ARTICLE 9 PAYMENTS AND COMPLETION

### §9.3 APPLICATIONS FOR PAYMENT

2. **§9.3.1 Revise to read as follows:** The Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under §9.2., for completed portions of the Work. All taxes shall be listed separately on the Application for Payment. Such application shall be notarized and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and lien waivers of the Contractor and all Subcontractors and suppliers furnishing in excess of \$25,000.00 of labor, services, and/or materials (if requested), and shall reflect retainage as provided for in the Contract Documents. The time frame for submission, processing and issuance of payments shall be as established in the AIA A101-2007 Standard Form of Agreement Between the Owner and the Contractor. All interim and final lien waivers shall be furnished on a form approved by the Owner.
3. **§9.3.1 Add the following:**
- a. **§9.3.1.3** Until the Work is 50 percent complete, the Owner shall pay NC-95 [xx] percent of the amount due to the Contractor on account of progress payments. At the time the Work is 50 percent complete and thereafter, the Contractor shall submit, for Owner's and Architect's review and approval a written request for retainage reduction. Upon Owner's approval, with written consent of the surety, the Architect may certify remaining partial payments to be paid in full. The Contractor, as a condition precedent to retainage reduction shall submit, for review and approval by the Architect the required O&M manuals.
- b. **§9.3.1.4** The Owner may elect to reinstate the full Contract retainage if the manner of completion of the Work and its progress do not remain satisfactory to the Architect or if the Surety withholds or revokes its consent, or for other good and sufficient reasons.
- c. **§9.3.1.5** The Contractor shall submit with each Application for Payment a notarized Statement of Sales Tax Paid on a form approved by the Owner.
4. **§9.3.2 Add the following:**
- a. **§9.3.2.1** In requesting payment for materials stored on or off the site, the Contractor shall submit with his Application for Payment the following:
- .1 An itemized list of the stored material prepared in sufficient detail to identify the materials and their value. Include an accounting for new items stored, paid items that continue in storage, and items previously stored and since incorporated in the Work.
  - .2 Evidence such as bills of sale or such other proof acceptable to the Owner or Architect to substantiate that the materials listed have been paid for by the Contractor, or, for materials stored at the site only, a notarized statement from the materials supplier stating that the

materials will become the property of the Owner upon payment by the Owner to the Contractor.

- .3 Evidence that the Surety agrees to payment to the Contractor for stored items as indicated herein.
- .4 Evidence that Contractor's insurance coverage for stored items is in force, naming the Owner as additionally insured.

b. **§9.3.2.2** For material stored off the site, the Contractor shall additionally submit with his Application for Payment the following:

- .1 Evidence that the materials are stored at the location previously agreed to in writing as provided by Subparagraph 9.3.2 of the General Conditions. No payment will be made for material stored off the site until the storage location has been agreed upon in writing.
- .2 Evidence that the storage location is bonded in a manner satisfactory to the Owner.
- .3 Evidence that the materials are insured while in storage and while in transit to the site.
- .4 Evidence that transportation to the site will be provided by the Contractor.
- .5 Accounting for cost of stored items approved on previous Applications for Payment and not yet installed in the Work.

5. **Add the following:**

**§9.3.4** If any subcontractor, laborer or materialman of the Contractor or any person directly or indirectly acting for, through or under it or any of them, files or maintains a mechanics' lien or claim against the Project or any part thereof, or against any funds due or to become due from the Owner to the Contractor, the Contractor agrees to cause such liens and claims to be satisfied, removed or discharged at its own expense by bond, payment or otherwise within 10 days from the date of notice thereof, and upon its failure so to do the Owner shall have the right, in addition to all other rights and remedies provided under the Contract Documents or by law, to cause such liens or claims to be satisfied, removed or discharged by whatever means the Owner chooses, at the entire cost and expense of the Contractor (such cost and expense to include legal fees and disbursements). The Contractor agrees to defend, indemnify, protect and save harmless the Owner from and against any and all such liens and claims and actions brought or judgments rendered thereon, and from and against any and all loss, damages, liability, costs and expenses, including legal fees and disbursements, which the Owner may sustain or incur in connection therewith.

**§9.7 FAILURE OF PAYMENT**

6. **§9.8.3 Add the following:**

7. If more than two inspections by the Architect are necessary, such inspections will be done at the Contractor's expense per the Additional Services provisions of the Architect's Agreement with the Owner. The Architect's fees and expenses for any such additional inspections will be deducted from amounts due the Contractor on the subsequent Application for Payment.

- a. **§9.8.3.1** Except with the consent of the Owner, the Architect will perform no more than two (2) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amount paid to the Architect for any additional inspections.

**§9.10 FINAL COMPLETION AND FINAL PAYMENT**

8. **§9.10.2 Delete §9.10.2 and substitute the following:**

**§9.10.2** Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5) other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor and/or supplier refuses to furnish a release or waiver required by the Owner, the Contractor shall furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees. Final payment shall not be due until all punch list items have been completed, and Contractor has furnished Owner with all warranties, waivers, guarantees, final as-built drawings and documents with changes to original denoted by "clouding," three (3) sets of operation manuals, and any other close-out documents required by the Contract Documents. The Contractor's compliance with all provisions contained in Article 9 is a condition precedent to Contractor's receipt of Final Payment.

**§9.10.4 *Replace in its entirety with the following:*** The making of final payment shall not constitute a waiver of Claims by the Owner.

9. **Add the following:**

**§9.10.6** At any time during the performance of this Agreement and for a period of thirteen (13) months after Final Payment under this Agreement, Owner shall have the right to examine and audit at his cost, through its designated representative, the Contractor's records with respect to all matters related to: (1) Change Orders; (2) Claims; (3) Applications for Payment; and (4) performance of the Contractor's obligations under the Contract Documents. In the event Owner identifies an overpayment or improper payment to the Contractor as a result of an audit, Owner may offset the overpayment or improper payment against other amounts otherwise due the Contractor under this Agreement, or, if there are no further funds due to the Contractor, Contractor shall reimburse the Owner for the overpayment or improper payment promptly upon demand.

10. **Add Section 9.11 LIQUIDATED DAMAGES as follows:**

O. **§9.11 LIQUIDATED DAMAGES**

- a. **§9.11.1** The Owner and Contractor recognize that time is of the essence to this contract, and that a delay in achieving Substantial Completion within the Contract Time is a breach and will necessarily cause damages to the Owner. Such damages include but are not limited to: delayed or diminished use of facility; inconvenience to building users; increased inspection, oversight and administrative costs to the Owner; diversion of the Owner's employees from other tasks and projects; increased and extended project overhead; and inefficiencies and loss of productivity
- b. **§9.11.2** All parties acknowledge that said damages are likely to occur but would be difficult to ascertain or determine, and that a legal proceeding to prove such damages would be time-consuming and expensive. Therefore, in the event of delayed performance the following amounts will be charged against the Contractor, and the Contractor's surety if any, as liquidated damages and not as a penalty:
- c. **§9.11.2.1** The amount of **\$1,000.00** per calendar day for failing to meet the Contract Time.

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- d. **§9.11.2.2** The parties agree that said liquidated damages are a reasonable estimate of the damages to Owner resulting from the Owner's delayed beneficial occupancy and that they are not a penalty. The above liquidated damages shall not be construed as constituting a claim or award for consequential damages.
- e. **§9.11.3** The Owner may withhold liquidated damages from any payment to Contractor. Making Final Payment shall constitute a waiver of the Owner's right to liquidated damages not withheld unless the right to assess liquidated damages is specifically reserved in writing by Owner. The Owner's entitlement to liquidated damages shall not be considered a Claim subject to the time limitation for asserting Claims, but rather accrues automatically upon the Contractor's failure to meet the Contract Time.
- f. **§9.11.4** Liquidated damages shall not be assessed for the Contractor's delayed performance if and to the extent the delay is due to acts or omissions of the Owner or to other events beyond the Contractor's control. The Contract provides a procedure by which the Contractor may make a Claim for an increase in the Contract Time; it is Contractor's responsibility to follow the Claim procedure in a timely manner in order to obtain additional time to perform. Failure by the Contractor to make timely Claim and obtain additional time under said contract procedure constitutes a waiver, in which case the Owner shall be entitled to liquidated damages for delayed performance without need for the Owner to establish that the Contractor was responsible for the delay.
- g. **§9.11.5** The parties acknowledge that this liquidated damages provision is not intended to apply to all additional costs incurred by Owner as a result of breach or delay. Specifically, this liquidated damages provision does not apply to additional costs incurred by Owner for correction of defective work or completion of the construction contract; additional legal, and design professional costs resulting from breach or delay. Such damages, losses and expenses are likely to be ascertainable in the event of a breach and are thus outside the scope of this liquidated damages provision. The parties agree that the Owner's right to recover liquidated damages for delay is in addition to, and not in lieu of recovery of such ascertainable items of damages.
- h. **§9.11.6** The Owner's right to liquidated damages shall not be affected or waived by the Owner's termination of the contract upon material breach by the Contractor, nor by the Owner's permitting the Contractor to continue and finish the work or any part thereof after the expiration of the specified completion dates.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### P. §10.2 SAFETY OF PERSONS AND PROPERTY

1. **§10.2.2 Add the following:**
- a. **§ 10.2.2.1** In the event that review, inspection or other action by regulatory agencies or other parties results in the imposition of fines, fees, or other costs due to the failure of the Contractor to comply with said applicable laws, ordinances, rules, regulations and lawful orders, the Contractor shall hold harmless the Owner, the Architect, and Owner's separate contractors, if any, from all consequences arising from the Contractor's noncompliance.
2. **§10.2.4 Add the following:**
- a. **§ 10.2.4.1** When use or storage of explosives or other hazardous materials, substances or equipment, are intended for execution of the Work or when use of unusual construction methods is planned, the Contractor shall give the Owner reasonable advance notice.

**§10.3 HAZARDOUS MATERIALS**

**§10.3.2 *Revise to read as follows:*** Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, **contract with a qualified third party** to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

**§10.3.3: *Delete §10.3.3*** in its entirety.

**§10.3.4 *Revise to read as follows:*** The Owner shall not be responsible under this **§10.3** for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The **Contractor shall not be** responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances. The Contractor agrees not to use fill products or other materials to be incorporated into the Work which may contain any asbestos or PCB, or are hazardous, toxic or comprised of any items that are hazardous or toxic.

**§10.3.6: *Delete §10.3.6*** in its entirety.

**ARTICLE 11 INSURANCE AND BONDS****Q. §11.1 CONTRACTOR'S LIABILITY INSURANCE**

1. **§11.1.1.1 Delete the semicolon at the end and add the following:**
  - a. "... including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project."
2. **§11.1.1.2 Delete the semicolon at the end and add the following:**
  - a. "... or persons or entities excluded by statute from the requirements of **§11.1.1.1** but required by the Contract Documents to provide the insurance required by that clause;"
3. **§11.1.2 Add the following:**
  - a. **§11.1.2.1** The Limits for Worker's Compensation and Employers' Liability insurance shall meet statutory limits mandated by State and Federal Laws. If (1) limits in excess of those required by statute are to be provided or (2) the employer is not statutorily bound to obtain such insurance coverage or (3) additional coverages are required, additional coverages and limits for such insurance shall be as set forth below.

**§11.1.2.2** Contractor shall, while performing the Work of construction of the Project, pay for, maintain and furnish with companies satisfactory to Contractor the following insurance coverages:

**Required Coverage**

**Required Policy Limits**

**.1 Worker's compensation (A)  
 Employer's liability (B)**

Coverage A:	Statutory benefits in the state(s) work is performed
Coverage B:	
Bodily injury by accident:	\$500,000 each accident
Bodily injury by disease:	\$500,000 policy limit
Bodily injury by disease:	\$500,000 each employee

**.2 Commercial General Liability**  
 (Coverage shall be written on ISO form CG 00 01 12 04 or an equivalent form and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract including the tort liability of another assumed in a business contract)

Each occurrence:	\$1,000,000
Products and completed operations aggregate limit:	\$1,000,000
Personal and advertising injury limit:	\$1,000,000
General aggregate limit (applicable per-project):	\$2,000,000

**.3 Auto Liability**  
 (Coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or an equivalent form and shall apply to any auto including owned, hired, and non-owned autos)

Each accident:	\$1,000,000
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**.4 Umbrella Liability**  
 (Coverage shall be at least as broad as the underlying coverage, including but not limited to completed operations and contractual liability)

Each accident:	\$10,000,000
Annual aggregate:	\$10,000,000

**.5 Professional Liability**  
 Coverage shall apply to negligent acts, errors or omissions arising from the Contractor's professional services defined to include architecture, engineering, land surveying, landscape architecture, and construction management (or other services if appropriate). The retro date will be prior to the commencement of work and will not be changed for up to three years after project completion. This coverage is only required if the Contractor is providing

Each claim:	\$1,000,000
Annual aggregate:	\$1,000,000

professional services (or overseeing such services via design-build project delivery).

**.6 Contractor's Pollution Liability**

Coverage shall apply to bodily injury or property damage arising from a pollution incident or event caused by the Contractor's activities. If such coverage is claims-made, the retro date will be prior to the commencement of work and will not be changed for up to three years after project completion.

Each claim:	\$1,000,000
Annual aggregate:	\$1,00,0000

**.7 Property Insurance/Contractors Equipment**

Contractor shall insure its own property and equipment (owned, rented or borrowed) including but not limited to tools, materials, supplies, equipment, forms, scaffolding towers, staging, bunkhouses, and other temporary structures including their contents except for such contents as are to be included in and remain a part of the permanent construction.

**§11.1.2.3** Contractor agrees to the following regarding the required insurance coverages:

1. Coverage shall be provided by insurers rated A VII or higher by A.M. Best. If an insurer's rating falls below A VII, then the Contractor shall notify the Owner and the Owner may request that the Contractor replace coverage at the Contractor's expense;
2. Equivalent coverage shall be maintained for at least three years after Substantial Completion;
3. All insurance coverages (except items .1, Workers Compensation, and .5, Professional Liability above) to be maintained and furnished hereunder by Contractor shall be primary and non-contributory with respect to the project not only as to Contractor, Owner and/or Architect but also as to any insurance maintained by Contractor, Owner and/or Architect;
4. No policy shall have a deductible of more than \$ 25,000.00 in respect to any single occurrence;
5. Contractor shall cause the Owner and Architect to each be named as an additional insured as to all insurance coverages required hereunder (except workers compensation and professional liability) to be maintained and furnished by Contractor;
6. The additional insured endorsement on the commercial general liability policy shall include both "on-going operations" and liability arising from "your work/completed operations" (the equivalent of ISO additional insured endorsement CG20-10-11-85) and the Contractor agrees to provide a copy of such endorsement to the Owner and the Architect;

7. Contractual liability insurance coverage (commercial general, umbrella, and auto liability) required to be maintained and furnished hereunder by Contractor shall specifically include coverage in respect to the indemnification provisions set forth herein. (If necessary, the auto policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01);
8. No exclusions for explosion, collapse, or underground hazards shall be added to the commercial general liability and, if applicable, the umbrella liability policy;
9. All insurance (except .5 – Professional Liability and .6 – Contractor's Pollution Liability) shall be maintained on an "occurrence" basis;
10. The Owner and Architect shall be notified in writing at least thirty (30) days prior to the effective date of any cancellation or reduction in coverage.
11. All required coverage shall include a waiver of any rights of subrogation by the insurer against Owner and Architect and shall be endorsed to recite the name of the Project and the location of the Project Site;
12. If the Contractors' liability policies do not contain the standard ISO separation of insureds condition, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage;
13. The workers compensation policy shall be endorsed to include coverage for USL&H benefits if the Contractor's employees work in or about navigable waterways;
14. The words "endeavor to" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives" shall be deleted from the certificate of insurance form's cancellation provision;
15. Contractor shall, before commencing the Work and thereafter from time to time promptly upon request of the Owner and the Architect, deliver to the Owner and the Architect ACORD form certificates of insurance, including copies of applicable policy endorsements, indicating that Contractor is in compliance with the insurance requirements set forth herein. Such certificates of insurance shall be provided/updated annually until three years after project completion;
16. Contractor shall require that the Subcontractors maintain the same and shall maintain (at the job site) copies of the same documents the Contractor is required to furnish to the Owner.

§11.1.2.4 Failure of the Contractor to supply a certificate of insurance or other evidence of full compliance with these insurance requirements or failure of the Owner and/or Architect to identify a deficiency from evidence that is provided shall not be construed as a waiver of the Contractor's obligation to maintain such insurance.

§11.1.2.5 Failure to maintain the required insurance may result in termination of this contract at the Owner's option. If the Contractor fails to maintain the insurance as set forth herein, the Owner shall have the right, but not the obligation, to purchase said insurance at Contractor's expense and charge back such costs against the Contract Sum otherwise due the Contractor.

§11.1.2.6 By requiring insurance herein, the Owner does not represent that coverage and limits will necessarily be adequate to protect Owner, Architect, and/or Contractor and such coverage and limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to the Contractor in this contract.

§11.1.2.7 Products and completed operations coverage shall be maintained for three years after final payment.

4. **§11.1.3 Delete §11.1.3 and substitute the following:**

**§11.1.3** Certificates of insurance acceptable to the Owner shall be filed with the Owner and the Architect prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this **§11.1** shall contain a provision that coverage's afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner and the Architect. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by **§9.10.2** and thereafter upon renewal or replacement of such coverage until the expiration of the time required by **§11.1.2**. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

5. **§11.1.3 Add the following:**

- a. **§11.1.3.1** If this insurance is written on a Commercial General Liability policy form, the certificates shall be ACORD Form 25-S, completed and supplemented in accordance with AIA Document G715, Instruction Sheet and Supplemental Attachment for ACORD Certificate of Insurance 25-S.
- b. **§11.1.3.2** Certificates of Insurance shall include the Owner and the Architect as additionally named insureds.

6. **Add §11.1.5 as follows:**

- a. **§11.1.5** The Contractor shall furnish one copy of each Certificate of Insurance herein required attached to each copy of the Agreement, plus three additional copies of each Certificate of Insurance herein required, which shall specifically set forth evidence of all coverage required by Sections §11.1.1, §11.1.2, and §11.1.3.
- b. **§11.1.5.1** The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits, including an endorsement requiring 30 days written notice to the Owner of such emendation or cancellation of coverage or limits.
- c. **§11.1.5.2** The Contractor shall furnish to the Owner a copy of the Insurance Policy prior to the first Application for Payment.

R. **§11.4 PERFORMANCE BOND AND PAYMENT BOND**

1. **§11.4.1 Delete Section 11.4.1 in its entirety and insert new §11.4.1 as follows:**

- a. **§11.4.1** Upon execution of the Contract Documents, the Contractor shall furnish to the Owner a Performance Bond and a separate Labor and Material Payment Bond, acceptable to the Owner and underwritten by a surety authorized to do business in the state in which the project is to be constructed, each in an amount equal to 100 percent of the Contract Sum for each bond. The bonds shall guarantee the Contractor's faithful performance of the Contract and payment of all obligations arising thereunder. The bonds shall remain in force until the Work has been completed and accepted by the Owner, the provisions of all guarantees required by these Contract Documents have been fulfilled, and the warranty periods and period for correction of the Work as given in §12.2, as amended by these Supplementary Conditions, have expired, or the period for filing mechanics' liens has expired, whichever occur latest, after which time the bonds shall lapse. The Contractor shall bear all costs in connection with the bonds as a part of the Contract. One executed copy of each bond shall be attached to each executed copy of the Contract Documents prior to the execution of the Contract Documents by the Owner.
- b. **§11.4.1.1** These bonds shall be furnished to the Owner in the "Standard Form of Performance Bond and Labor and Material Payment Bond", AIA Document A312, latest edition.

- c. **§11.4.1.2** The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney, acceptable under the requirements of the project state.
- d. **§11.4.1.3** If the Work is to be commenced prior to the date the Agreement is entered into, the contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that said bonds will be furnished.
- §11.4.1.4** If Payment and Performance Surety Bonds are required hereunder pursuant to Exhibit \_\_, Contractor shall pay for the Bonds and shall, before commencing the Work, cause the Bonds to be issued and delivered to the Owner and the Architect, it being specifically understood and agreed that, if Bonds are required hereunder pursuant to Exhibit \_\_, the Bonds shall, unless Owner otherwise agrees in writing, be issued by a surety approved by the U.S. Treasury Department to issue bonds in connection with federal projects.

## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### §12.2 CORRECTION OF WORK

#### §12.2.2 AFTER SUBSTANTIAL COMPLETION

**§12.2.2.1 *Revise to read as follows:*** In addition to the Contractor's obligations under **§3.5**, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under **§9.9.1**, or by terms of an applicable special warranty required by the Contract Documents, **the Owner discovers that** any of the Work is not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. Eleven months after the date of Substantial Completion and prior to the expiration of one year after the date of Substantial Completion, the Contractor shall set up and conduct, at the convenience of the Owner, an inspection of the Project with the Architect and Owner or an Owner's representative, for the purpose of discovering and identifying any Work not in accordance with the Contract Documents. During the one-year period for notifying the Contractor to correct any such Work,, if the Owner **discovers, but** fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with **§2.5**.

**§12.2.2.2 *Revise to read as follows:*** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

**§12.2.2.3 *Revise to read as follows:*** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this **§12.2, except as to the corrective work**.

**§12.2.5 *Revise to read as follows:*** Nothing contained in this **§12.2** shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents **or the law of the state where the Project is located**. Establishment of the one-year period for correction of Work as described in **§12.2.2** relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents **or the law of the state where the Project is located** may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

**2. Add the following:**

**§12.2.6** The one-year obligation set forth in **§12.2.2.1** above is in addition to all other rights and remedies of the Owner both at law and equity and shall in no way be construed as limiting or waiving any rights or remedies available to the Owner.

**1.2 §12.3 ACCEPTANCE OF NONCONFORMING WORK****1. Add the following sentence to the end of Section:**

- a. "The acceptance of nonconforming Work by the Owner shall be by written Change Order or Construction Change Directive, signed by the Owner's authorized representative. No person has authority to accept nonconforming work except the Owner."

**ARTICLE 13 MISCELLANEOUS PROVISIONS****§13.1 GOVERNING LAW: *Revise to read as follows:***

The Contract shall be governed by the law of the place where the Project is located.

**2. §13.3 Add the following:**

Service of any claim shall be pursuant to the Rules of Civil Procedure of the jurisdiction governing this Agreement.

**§13.5 INTEREST: *Revise to read as follows:***

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at **1.5% per month**.

**§13.7 TIME LIMITS ON CLAIMS: *Revise to read as follows:***

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the laws and rules of the jurisdiction governing this Agreement (including but not limited to the Rules of Civil Procedure, case and/or statutory law) or the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 8 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this **§13.7**.

**ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT****§14.2 TERMINATION BY THE OWNER FOR CAUSE****3. Add the following:**

**§14.2.5** The Contractor shall bear the costs of any additional services of the Architect resulting from the Owner's termination of the Contract pursuant to this **§14.2**.

**4. §14.4 TERMINATION BY OWNER FOR CONVENIENCE****5. §14.4.3 Delete Section 14.4.3 in its entirety and insert new §14.4.3 as follows:**

- 6. §14.4.3** In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and actual costs incurred by reason of such termination.

**ARTICLE 15 CLAIMS AND DISPUTES****7. §15.1 CLAIMS****8. §15.1.1 Add the following:**

All Claims must be supported by a complete detailed chronology of all applicable backup data, including copies of all applicable Contract Documents, Submittals, Requests for Information, Bulletin Drawings, correspondence, Construction Change Directives, and all other documents directly related to the Claim. The Architect shall have no obligation to review a Claim that is not accompanied by the required supporting data.

### §15.1.3 NOTICE OF CLAIMS

- a. **§15.1.3 Add the following:**
- b. Any notice of Claim not submitted in a timely manner in accordance with the terms of this Article shall cause such claim to be deemed waived by the Contractor. The Contractor acknowledges and agrees that the Owner can only waive the requirements of this Article in writing and that Contractor is not entitled to rely on any oral statement of the Owner to the contrary. Claims, including backup documentation requested in writing by the Owner, shall be submitted within twenty-one (21) days of the notice required by this Article, or shall be deemed waived.
- c. **§15.1.3.1** Claims for increases in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.
- d. **§15.1.3.2** The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor, or for delays not affecting tasks not identified as critical tasks affecting the date of completion of the Work.

### §15.1.6 CLAIMS FOR ADDITIONAL TIME

#### *§15.1.6.1 Add the following:*

Only delay impacting the critical path of the Work shall be considered in determining whether the Contractor is entitled to additional time. The provisions of this Article are subject to the provisions of **Article 15**, which shall control in the event of any inconsistency, including the time period for providing notices of Claims and submission of Claims.

#### *e. Add the following:*

**§15.1.8** The Owner and Architect waive consequential damages against each other for claims, disputes or other matters in question arising out of or relating to this Agreement. This mutual waiver is applicable, without limitation, to all consequential damages by either party against either party due to either party's termination of this Agreement, except as specifically provided herein. Such waiver shall survive the fulfillment or termination of this Agreement and shall inure to and/or burden the heirs, assigns, and/or successors of the parties hereto.

### §15.2 INITIAL DECISION

**§15.2.1** *Revise to read as follows:* Claims, excluding those arising under **§10.3**, **§10.4**, and **§11.5**, shall be referred to the Initial Decision Maker for initial decision if the claimant first recognizes the claim prior to the date of final payment. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this **§15.2.1**, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having

been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§15.2.3 Revise to read as follows:** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense. **In the event that the decision is rendered in the Owner's favor, Contractor shall reimburse Owner for cost of retention of such persons.**

f. **§15.2.5 Add the following:**

or litigation.

**§15.3 MEDIATION**

g. **§15.3.1 Add the following:**

The means of dispute resolution shall be subject to the provisions of the parties' respective agreements with the Owner.

**§15.3.2 Revise to read as follows:** The parties shall endeavor to resolve their Claims by mediation, **utilizing one (1) mutually agreed upon mediator, who is certified as a mediator in the state in which the Project is located and who has extensive experience in construction litigation in that state.** A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. If a claim involves the Architect, the Architect shall be given written notice of such claim and the Architect may become a party to the mediation at its discretion. The request may be made concurrently with the filing of binding dispute resolution and/or legal proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution and/or legal proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

**§15.4 ARBITRATION: Delete § 15.4 ARBITRATION in its entirety.**

END OF DOCUMENT 007300

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SECTION 012300 - ALTERNATES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

## 1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

## 1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of the Contract.
- D. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

## 3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Baseball and Softball Fields.
  - 1. Base Bid: Provide grass field with conduit only as indicated on Drawings and Specifications.

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2. Alternate: Provide field lights at Baseball and Softball fields as indicated on Drawings and Specifications.
- B. Alternate No. 2: Football Field.
1. Base Bid: Provide grass field with conduit only as indicated on Drawings and Specifications.
  2. Alternate: Provide field lights at Football field as indicated on Drawings and Specifications.
- C. Alternate No. 3: Chain-Link Fencing.
1. Base Bid: Provide decorative metal fence along road frontage and Specifications.
  2. Alternate: In lieu of decorative metal fence, provide chain-link fence with black vinyl as indicated on Drawings and Specifications.
- D. Alternate No. 4: 8-Lane Running Track.
1. Base Bid: Provide 6-lane running track as indicated on Drawings.
  2. Alternate: Provide 8-lane **synthetic** running track as indicated on Drawings.
- E. Alternate No. 5: Owner-Preferred Vendor Package for Mechanical System.
1. Provide Schneider BAS Controls (no substitutions) as indicated on Drawings and specifications.
- F. Alternate No. 6: Owner-Preferred Vendor Package for Electrical.
1. Provide cost for Square D as indicated on Drawings and specifications.
- G. Alternate No. 7: Owner-Preferred Vendor Package for Boilers.
1. Provide cost for boilers by Weil McLain (no substitutions).
- H. Alternate No. 8: Owner-Preferred Vendor Package for HVAC equipment.
1. Provide cost for Chillers, Air Handling Units, and Rooftop Units by Trane and DDC Controls by Schneider (no substitutions).

END OF SECTION 012300

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**SECTION 087100 – DOOR HARDWARE****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Mechanical door hardware for the following:
    - a. Swinging doors.
    - b. Sliding doors.
    - c. Folding doors.
    - d. Other doors to the extent indicated.
  2. Cylinders for doors specified in other Sections.
  3. Electrified door hardware.

**1.2 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
1. Installation Templates: Distribute for doors, frames, and other Work specified to be factory prepared. Check Shop Drawings of other Work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
  2. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
  3. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- B. Pre-Submittal Hardware and Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 - Project Management and Coordination prior to preparing final submittals, including Owner, Architect, and supplier of hardware to determine the following:
1. Lock Function: Demonstrate function/type of each lockset scheduled and verify function at each door.
  2. Electrical Operation: Verify function of openings requiring electrified hardware.
  3. Keying Schedule: Provide keying schedule with keying designations conforming to Door and Hardware Institute document "Keying Systems and Nomenclature" prior to ordering permanent cores. Determine keying requirements for preparation of final keying schedule.
  4. Submit letter of compliance, indicating when this meeting was held and who was in attendance, to Architect, Owner, and hardware supplier.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 - Project Management and Coordination. Review methods and procedures related to electrified door hardware including the following:
1. Attendees: Architect, Owner, Contractor, door hardware supplier, door and frame supplier, and installers of Work of this Section and of Work related to this Section.
  2. Review materials, procedures and coordinating related Work.

3. Inspect and discuss electrical roughing-in and other preparatory Work, including Work performed by other trades.
  4. Review sequence of operation for each type of electrified door hardware.
  5. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  6. Review required testing, inspecting, and certifying procedures.
  7. Record minutes of meeting, indicating when it was held and who was in attendance, and submit to Owner, Architect, and hardware supplier.
- D. Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 - Project Management and Coordination.
1. Attendees: Owner, Contractor, and Architect, Installer's Architectural Hardware Consultant.
  2. Incorporate keying meeting decisions into final keying schedule after reviewing door hardware keying system including the following:
    - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    - b. Preliminary key system schematic diagram.
    - c. Requirements for key control system.
    - d. Requirements for access control.
    - e. Address for delivery of keys.
- E. Postinstallation Conference: After installation of hardware, conduct conference at Project site to comply with requirements in Section 013100 - Project Management and Coordination. Review methods and procedures related to electrified door hardware including the following:
1. Attendees: Architect, Owner, Contractor, Installer's Architectural Hardware Consultant (AHC), door hardware supplier, door and frame supplier, manufacturers representative of continuous hinges, locks, closers, and exit devices, and installers of Work of this Section and of Work related to this Section.
  2. Inspect hardware for proper installation and function.
  3. Schedule follow-up meeting with Architect, Owner, hardware supplier, and manufacturers' representatives to explain functions and use and maintenance of hardware installed.
  4. Record minutes of meetings, indicating when it was held and who was in attendance, and submit to Owner, Architect, and hardware supplier.

### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Details of electrified door hardware.
1. Wiring Diagrams: Power, signal, and control wiring. Verify voltage with electrical engineer. Include the following:
    - a. Schematic diagram of systems that interface with electrified door hardware.
    - b. Point-to-point wiring diagram indicating detailed interface between electrified door hardware, fire alarm, and security systems. Clarify between manufacturer-installed and field-installed wiring.
    - c. Riser diagram, including electrified components, gage of wire, and wire run.

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- d. Elevation of doors controlled by electrified door hardware.
  2. Detail interface between electrified door hardware and fire alarm, access control, security, and building control system.
  3. Operation Narrative: Describe operation of doors controlled by electrified door hardware.
- C. Samples for Verification: For each type of exposed product, in each finish specified.
1. Sample Size: Full units or minimum 2-by-4-inch Samples for sheet and 4 inch long Samples for other products.
    - a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into Work, within limitations of keying requirements.
  2. Tag Samples with full product description to coordinate Samples with door hardware schedule.
- D. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant (AHC). Coordinate door hardware schedule with doors, frames, and related Work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Hardware schedules submitted without AHC's signature will be rejected without review.
  2. Submittal Sequence: Submit final door hardware schedule before or concurrent with submissions of Product Data, Shop Drawings, and Samples. Coordinate submission of door hardware schedule with scheduling requirements of other Work to facilitate fabrication of other Work that is critical in Project construction schedule.
  3. Format: Use same scheduling sequence, format, and door numbers indicated in Contract Documents.
  4. Content: Include the following information:
    - a. Identification number, location, hand, fire rating, and material of each door and frame.
    - b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    - c. Complete designations, including name and manufacturer, type, style, function, size, quantity, and finish of each door hardware item.
    - d. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
      - 1) Sequence of Operation: Include description of component functions that occur in the following situations: Authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
    - e. Fastenings and other pertinent information.
    - f. Explanation of abbreviations, symbols, and codes contained in schedule.
    - g. Mounting locations for door hardware.
    - h. Door and frame sizes and materials.
    - i. List of related door devices specified in other Sections for each door and frame.
- E. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

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#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Architectural Hardware Consultant.
- B. Product Certificates: For electrified door hardware.
  - 1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- D. Sample Warranty: For special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Data: For each type of door hardware to include in maintenance manuals, including the following:
  - 1. Maintenance instructions and warranty information for each item of hardware.
  - 2. Catalog pages for each product.
  - 3. Contact information for supplier of hardware and local representatives of each product manufacturer.
  - 4. Parts list for each product.
- B. Schedules: Final door hardware schedule, keying schedule, and wiring diagrams.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Maintenance Tools and Instructions: Furnish complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- C. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Door hardware.
  - 2. Electrical parts.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products, with minimum of three years' experience in installation of commercial hardware similar to that required for this Project, is an employer of workers trained and approved by product manufacturers, and employs an Architectural Hardware Consultant (AHC) who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.
  - 1. Successfully completed not less than five comparable scale projects.
  - 2. Warehousing Facilities: In Project's vicinity.

3. Scheduling Responsibility: Preparation of door hardware and keying schedules.
  4. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Installer Qualifications - Low Energy Power Operator: Certified by The American Association of Automatic Door Manufacturers (AAADM) or manufacturer's certified Power Operator Preferred Installer (POPI) for both installation and maintenance of operator units specified for Project. Install and maintain low energy operators per ANSI 156.19, ANSI 117.1, NFPA 101 and local applicable codes.
1. Minimum Experience: Not less than three years in installation and service of automatic door equipment of same manufacturer.
  2. Maintenance Proximity: Not more than one hour normal travel time from Installer's place of business and Project site.
- C. Hardware Supplier Qualifications: Industry-recognized commercial hardware supplier that maintains and operates an office and stocking warehouse in Project area for at least two years, which is not more than one-half day of travel from Project site, and can document experience with projects of similar type and scale.
1. Consulting services include overseeing scheduling, coordinating of hardware, establishing keying schedule, and being available during construction to consult with Contractor, Architect, and Owner about mechanical and electrical door hardware specified.
- D. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC) and an Electrified Hardware Consultant (EHC).

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware to prevent damage during transit and storage. Deliver products in original unopened packaging with legible manufacturer's identification.
1. Store hardware in a secured and dry environment to protect against loss, theft and damage.
- B. Deliver complete shipment of door hardware as detailed in Door Hardware Schedule and per approved Shop Drawings.
- C. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
1. Compare delivered hardware to approved Hardware Schedule. Report shortage of products or damaged products to Architect and supplier within 24 hours of delivery. Shortages not reported are Contractor's responsibility and will not be an additional cost to Owner.
- D. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys, permanent cores, and related accessories directly to Owner via registered mail or overnight package service.
- G. Electronic Access Control Hardware Requirements: Do not store electronic access control hardware, software or accessories at Project site without prior authorization and climate controlled facility. Failure to do so will void electronic warranties.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
  - 1. Failures include the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of doors and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  - 2. Warranty Period: Begins from date of Substantial Completion, unless otherwise indicated.
    - a. Mechanical Grade One Locksets: Seven years
    - b. Electrified locksets: Two years
    - c. Electromechanical and Electronic Products: Two years.
    - d. Exit Devices: Two years.
    - e. Panic Exit Hardware Trim: Five years.
    - f. Mechanical Door Closer Body: 10 years
    - g. Low-Energy Operators: Two years.
  - 3. Repair defects from faulty materials or workmanship developed during guarantee period, or replace with new materials, at no expense to Owner.
- B. Low Energy Power Operators: Provide extended warranty from defects in material or workmanship under normal use for a period of three years from date of Substantial Completion for units installed by a certified power operator Installer per manufacturer's written warranty certificate.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled in Part 3 Door Hardware Schedule Article and on Drawings to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products. Where named manufacturers' products are not indicated, provide products complying with BHMA designations referenced.
  - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

- 
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 Door Hardware Schedule Article. Products are identified by using door hardware designations, as follows:
1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 Door Hardware Schedule Article.
  2. References to BHMA Designations: Where products are not specified by name, provide products complying with BHMA designations and requirements for description, quality, and function.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer unless indicated otherwise.
1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

## 2.2 PERFORMANCE CRITERIA

- A. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure per NFPA 252 or UL 10C, unless otherwise indicated.
1. This requirement takes precedence over other requirements for such hardware. Provide hardware that has been tested and listed by UL for type and size of door required, and complies with requirements of door and doorframe labels. Latching hardware, door closers, ball bearing hinges, and seals are required whether or not listed in Hardware schedule.
- B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested per UL 1784 and installed per NFPA 105.
1. Air Leakage Rate: Maximum air leakage of 0.3 cfm per square foot at the tested pressure differential of 0.3 inch wg of water.
- C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- D. Means of Egress Doors: Latches do not require more than 15 pound-force to release latch. Locks do not require use of a key, tool, or special knowledge for operation.
- E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with a force of not more than 5 pound-force.
  2. Comply with the following maximum opening-force requirements:
    - a. Interior, Non-Fire-Rated Hinged Doors: 5 pound-force applied perpendicular to door.
    - b. Sliding or Folding Doors: 5 pound-force applied parallel to door at latch.

- c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, door will take at least 3 seconds to move to a point 3 inches from the latch, measured to leading edge of door.

F. Electromechanical Hardware:

1. Electrical products contained in this Specification represent a complete engineered system. If alternate electrical products are submitted, it is responsibility of supplier to bear cost of providing complete and working system including re-engineering of electrical diagrams and system layout, as well as power supplies, power transfers, and required electrical components. Coordinate with electrical engineer and electrician to ensure that line voltage and low voltage wiring is coordinated to provide a complete and working system.
2. For each item of electrified hardware specified, provide standardized Molex plug connectors to accommodate up to 12 wires. Molex plug connectors shall plug directly into through-door wiring harnesses, frame wiring harnesses to power supplies.
  - a. If plug connectors are not available, coordinate installation and hook-up of hardware with a company that is licensed by Local Electricity Board.
  - b. Electrified Hinges: UL fire tested and listed for labeled doors up to and including Class "A".
3. Where Electrified functions are specified, provide manufacturer's recommended power supply that is filtered and regulated; and listed and labeled for use with fire alarm systems, with power sufficient to operate electrified function specified.
4. Electrical: Electrical boxes in walls, electrical service, conductors, and final connections are specified in Division 26:

### 2.3 HINGES

- A. Hinges: Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames. BHMA A156.1. Listed under Category A in BHMA's "Certified Product Directory."
  1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Bommer Industries, Inc.
    - b. Hager Companies.
    - c. IVES Hardware; an Allegion company.
    - d. McKinney Products Company; an ASSA ABLOY Group company.
    - e. Stanley Commercial Hardware; Div. of Stanley Security Solution Inc.
- B. Provide hinges with anti-friction bearings for doors scheduled to receive closers.
- C. Hinge Sizes: Provide hinges in widths sufficient to minimally clear trim to allow a door to swing fully open without striking door frame or adjacent wall.
  1. Height:
    - a. 1 pair per leaf for openings through 60 inches high.
    - b. 1 additional hinge per leaf for each additional 30 inches in height or fractions thereof.
  2. Width:

- a. Doors up to and including 36 inches wide: 4-1/2 inch by 4-1/2 inch and 0.134 inch thick.
- b. Doors over 36 inches up to and including 42 inches wide: 5 inch by 4-1/2 inch and 0.180 inch thick.
- c. Doors over 42 inches up to and including 48 inches wide: 5 inch by 4-1/2 inch and 0.190 inch thick.
- 3. 1 additional hinge for exterior doors.

D. Applications:

- 1. Exterior out swinging doors: Type 5 x NRP.
- 2. Exterior in swinging doors and vestibule doors: Type 4.
- 3. Interior doors with closers: Type 2 or 4.
- 4. Interior doors over 36 inches in width: Type 4.
- 5. Interior doors 36 inches or less without closer: Type 2.
- 6. Exterior and reversed beveled interior lockable doors: Non-removable loose pin (NRP) hinges.
- 7. Tips: Flat button type unless indicated otherwise in hardware groups.

<u>Type</u>	<u>Bommer</u>	<u>Hager</u>	<u>IVES</u>	<u>McKinney</u>
Type 2 (0.134 in.)	BB5000	BB1279		TA2714
Type 3 (0.134 in.)	BB5002	BB1191	5BB1	TA2314
Type 4 (0.180 in.)	BB5004	BB1168	5BB1	T4A3786
Type 5 (0.190 in.)	BB5006	BB1199	5BB1HW	T4A3386

2.4 CONTINUOUS HINGES

- A. Continuous Pin-and-Barrel Hinges: BHMA A156.26, Grade 1; minimum 0.120 inch thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete. Non-handed, edge mount unless otherwise specified. Geared type hinges are not acceptable.
  - 1. Material: Heavy-duty 0.075 inch stainless steel, unless otherwise scheduled.
  - 2. Tip: Flat-button type at public areas and cross-corridors.
  - 3. Knuckles: 2 inch long, including split nylon-bearing at each separation; quiet, smooth, self-lubricating operation.
    - a. Medical Bearing: "MB" Specially designed to provide clean and quiet operation and self lubricating with high resistance to wear.
  - 4. Adjusting Screws: Adjustable to correct frame irregularities up to 3/8 inch.
  - 5. Finish: US32D Satin, unless otherwise scheduled.

	<u>Hager</u>	<u>Markar</u>	<u>McKinney</u>	<u>Pemko</u>	<u>Stanley</u>
Concealed	790-900	FM-300	MCK-FM300	SPBMF	651

2.5 LOCKS

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
  - 1. Mortise Locks: Minimum 3/4 inch latchbolt throw.

- 2. Deadbolts: Minimum 1 inch bolt throw.
  - 3. Pairs of Doors: Minimum 3/4 inch latchbolt throw.
- C. Lock Backset: 2-3/4 inch, with deadlocking feature unless otherwise indicated.
- D. Lock Trim:
- 1. Description: Lustra by Corbin Russwin – Basis of Design.
  - 2. Levers: Cast or wrought and free-wheeling.
  - 3. Escutcheons (Roses): Wrought.
  - 4. Operating Device: Lever with roses.
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- 1. Curved Lip Strikes: For locks sized per Door and Hardware Institute.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
  - 4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.
- F. Mortise Locksets: BHMA A156.13; Operational Grade 1; stamped steel case with steel or brass parts; Series 1000.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    - b. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - c. Schlage Commercial Lock Division; an Allegion company.
- |                |                       |                |                |
|----------------|-----------------------|----------------|----------------|
|                | <u>Corbin-Russwin</u> | <u>Sargent</u> | <u>Schlage</u> |
| Lock           | ML2000                | 8200           | L-9000         |
| Sectional Trim | LWA                   | LNJ            | 03A            |
- 2. Provide locks with reversible handing of lock without disassembly of lock.
  - 3. Locate mortise locks so that centerline on lever matches centerline of levers of cylindrical locks.

2.6 MANUAL FLUSH BOLTS

- A. Manual Flush Bolts: BHMA A156.16; Grade 1; minimum 3/4 inch throw; designed for mortising into door edge.
- 1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
    - b. Burns Manufacturing Incorporated.
    - c. Door Controls International, Inc.
    - d. Hager Companies.
    - e. Hiawatha, Inc.
    - f. IVES Hardware; an Allegion company.
    - g. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - h. Trimco.

	<u>DCI</u>	<u>Hager</u>	<u>Ives</u>	<u>Rockwood</u>	<u>Trimco</u>
Manual-Metal Door	780F	282D	FB458	555	3917
Manual- Wood Door	790F	283D	FB358	557	3913

- B. Manual Flush Bolts – Aluminum Entrances: BHMA A156.16; Grade 1; minimum 3/4 inch throw; designed for use with aluminum stile entrances and deadbolt lock. Provide flush bolt manufacturer's strikes, bolt guides, and related hardware.
1. Manufacturers: Subject to compliance with requirements, provide specified products by the following:
    - a. Adams Rite Manufacturing Co.; an ASSA ABLOY Group company.
  2. Threshold Bolt: Part Number 4015.
  3. Header Bolt-1: Part Number 4016.
  4. Header Bolt-2: Part Number 4085 for pairs of doors only.

2.7 AUTOMATIC AND SELF-LATCHING FLUSH BOLTS

- A. Automatic and Self-Latching Flush Bolts: BHMA A156.16; Grade 1; minimum 3/4 inch throw; designed for mortising into door edge.
1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Door Controls International, Inc.
    - b. Hager Companies.
    - c. IVES Hardware; an Allegion company.
    - d. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - e. Trimco.

	<u>DCI</u>	<u>Hager</u>	<u>Ives</u>	<u>Rockwood</u>	<u>Trimco</u>
Self-Latch- Metal Door	845	294D	FB61P	2845	3820
Dust Proof Strike	82	280X	DP2	570	3911

2.8 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3, Grade 1.
1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    - b. Precision Hardware, Inc.; Division of Stanley Security Solutions, Inc.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. Von Duprin; an Allegion company.
  2. Provide exit devices UL listed for panic exit hardware based on testing per UL 305.
  3. Fire-Rated Doors: Provide exit devices complying with NFPA 80 and UL listed as "Fire Exit Hardware" based on testing per UL 305 and NFPA 252.
  4. Provide exit devices by single manufacturer.
  5. Provide vandal resistant outside trim to discourage abuse when door is locked. Provide trim with lever design to match locks.
  6. Provide device where noted with a photoluminescent coating which will produce visible EXIT signage in darkness or low lit areas similar to Yale "LUM".
  7. Provide cylinder dogging on non-rated devices.

- 8. For doors with narrow stiles, or as listed in hardware sets, provide devices designed for maximum 2 inch wide stiles.
- 9. Provide devices with a heavy duty flush end cap.
- 10. Removable Mullions: Keyed.
- 11. Electrified Options: Where scheduled in hardware sets, provide electrified exit device options, including: electric latch retraction, exit alarm, and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.
  - a. Provide manufacturer’s recommended power supply that is filtered and regulated; and listed and labeled for use with fire alarm systems, with power sufficient to operate electrified function specified.

	<u>Corbin-Russwin</u>	<u>Sargent</u>	<u>Von Duprin</u>
Narrow Stile	ED4000	AD8500	35A Series
Wide Stile	ED5000	80 Series	98 Series
Escutcheon/Pull	TH937	ET Trim	990NL

2.9 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Provide cylinders from the following to match Owner’s existing key system.
    - a. Corbin-Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - b. Medeco Security Locks, Inc.; an ASSA ABLOY Group company.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. Schlage Commercial Lock Division; an Allegion company.
- B. Standard Lock Cylinders: BHMA A156.5; Grade 1; face finished to match lockset.
- C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

2.10 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  - 1. Key cylinders per school district lock shop requirements.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    - b. Medeco Security Locks, Inc.; an ASSA ABLOY Group company.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - d. Schlage Commercial Lock Division; an Allegion company.
    - e. Yale Security Inc.; an ASSA ABLOY Group company.
- B. Keys: Nickel silver, factory-cut keys furnished with large bow.
  - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    - a. Notation: "DO NOT DUPLICATE."
  - 2. Quantity: In addition to 1 extra key blank for each lock, provide the following:

- a. Change Keys: 3 each per cylinder or keyed alike group.
  - b. Control Keys: 2 each.
  - c. Extra Key Blanks: 50 each.
  - d. Master Keys: 6 each per master key group.
  - e. Construction Control Keys: 2 each.
  - f. Construction Keys: 15 each.
3. Ship permanent keys, cores, master keys, change keys, and additional key blanks, permanent control keys, and bitting list indicating bitting generated for this Project, directly to Owner, via registered mail. Shipment shall be complete, with keys enveloped in sets and tagged with key set numbers (with proper code numbers and factory file or folio number). Do not pack permanent keys and cores with locks. If permanent keys, cores, or both are sent anywhere other than previously stated, replace at no additional cost to Owner.
- a. Forward Owner's Key System Registration Certificates, which shall accompany each procurement during construction period, to hardware supplier.

## 2.11 KEY CONTROL SYSTEM

- A. Key Control Cabinet: BHMA A156.5, Grade 1; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of number of locks.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Key Boxes and Cabinets.
    - b. GE Security, Inc.
    - c. HPC, Inc.
    - d. Lund Equipment Co., Inc.
    - e. MMF Industries.
    - f. Tri Palm International.
  2. Multiple-Drawer Cabinet: Cabinet with drawers equipped with key-holding panels and key envelope storage, and progressive-type ball-bearing suspension slides. Include single cylinder lock to lock all drawers.
  3. Wall-Mounted Cabinet: Cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
  4. Portable Cabinet: Tray for mounting in file cabinet, equipped with key-holding panels, envelopes, and cross-index system.
- B. Key Lock Boxes: Recess- mounted unit. 1/4 inch plate steel housing, 1/2 inch thick steel door with interior gasket seal and stainless steel door hinge, designed for storage of 10 keys.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. ABLOY Security, Inc.; an ASSA ABLOY Group company (ABL).
    - b. Knox Company (KNX): 3200 Series KNOX-BOX.
  2. Exterior Dimensions:
    - a. Surface Mounted: 4 inch H by 5 inch W by 3 1/4 inch D.
  3. Lock: UL Listed. Double-action rotating tumblers and hardened steel pins accessed by biased cut key. 1/8 inch thick stainless steel dust cover.
  4. Finish: Manufacturer's standard finish.
- C. Cross-Index System: Single-index system for recording key information. Include 3 receipt

forms for each key-holding hook. Set up by installer.

1. Manufacturers: Subject to compliance with requirements, provide Regent Wall Cabinet Series by Tri Palm International or comparable product from one of the following:
  - a. Lund Equipment Co., Inc.
  - b. MMF Industries.
2. Material: 0.0478 inch thick cold-rolled steel with manufacturer's gray paint.
3. Hinges: "No-sag", continuous piano-type.
4. Door: Provide nickel-plated brass, pin tumbler lock and 2 keys.
5. Size: Minimum 16-1/4 inch H by 12-1/8 inch W by 5 inch D.
6. Key Capacity: Minimum of 50 keys per panel.

2.12 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; stainless steel, unless otherwise indicated.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Burns Manufacturing Incorporated.
    - b. Forms + Surfaces.
    - c. Hager Companies.
    - d. Hiawatha, Inc.
    - e. IVES Hardware; an Allegion company.
    - f. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - g. Trimco.

2.13 ACCESSORIES FOR PAIRS OF DOORS

- A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.
  1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Door Controls International, Inc.
    - b. Hager Companies.
    - c. IVES Hardware; an Allegion company.
    - d. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - e. Trimco.

	<u>DCI</u>	<u>Hager</u>	<u>Ives</u>	<u>Rockwood</u>	<u>Trimco</u>
Bar Type Coordinator	600 Series	297D	COR7G	1600	3094

2.14 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4 Grade 1; cast iron body, rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide non-handed, multi-sized closers, adjustable to meet field conditions and requirements for opening force.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
- b. LCN Closers; an Allegion company.
- c. Norton Door Controls; an ASSA ABLOY Group company.
- d. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

	<u>Corbin-Russwin</u>	<u>LCN</u>	<u>Norton</u>	<u>Sargent</u>
Heavy Duty.	DC6000	4040XP	7500	281

- 2. Fully adjustable type, with complete spring power adjustment, sizes 1 through 6.
- 3. Provide closers with swing, latch, and backcheck features.
- 4. Provide heavy-duty spring stop with hold open where scheduled.
- 5. Coordinate with door supplier to provide proper blocking for surface mounting. Use of through-bolts is not acceptable.
- 6. Where closers are indicated to be closer/stops, provide heavy-duty arms with means of positive stop. For closer/holders, provide heavy-duty units with additional built-in mechanical holder assembly. Manually select holder to off/on position.
- 7. Install closers using only manufacturer-furnished template machine screws for metal doors and manufacturer -furnished wood screws for wood doors.
  - a. Use of self-drilling or self-tapping fasteners is not allowed.
- 8. Accessories: Mounting brackets, drop plates, special shoes required by door and frames conditions.

2.15 LOW ENERGY DOOR OPERATORS

- A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated; and complying with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation and safety devices.
  - 1. Wind Load: Provide door operators on exterior doors that will open and close doors and maintain them in fully closed position when subjected to wind load of 30.
- B. Electromechanical Operating System: Self-contained unit powered by permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor, connections for power and activation- and safety-device wiring, and manual operation including spring closing when power is off.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Besam Entrance Solutions; Subsidiary of ASSA ABLOY Entrance Systems: SW100.
    - b. DORMA Architectural Hardware: ED900 ED700 Series.
    - c. Horton Automatics: 6100 Series.
    - d. Hunter Automatics: Hunter Low Energy HA-8.
    - e. LCN Closers; an Allegion company: 9100 Series.
    - f. Nabco Entrances Inc.: Model GT350 GT500 Bottom Load or GT8350 GT8500 Side Load Swing Door System
    - g. Norton Door Controls; an ASSA ABLOY Group company: 5900 Series.
    - h. record-usa: Series 6100 Electromechanical Automatic Operator.
    - i. Stanley Access Technologies: Magic-Swing Series.
- C. Electrical Requirements: Coordinate power requirements for operation of operator with Division 26. Coordinate fire-alarm contracts as required.

- 
- D. Standard: BHMA A156.19.
- E. Performance Criteria:
1. Opening Force if Power Fails: Not more than 15 pound-force required to release a latch if provided, not more than 30 pound-force required to manually set door in motion, and not more than 15 pound-force required to fully open door.
  2. Entrapment Protection: Not more than 15 pound-force required to prevent stopped door from closing or opening.
- F. Cover for Surface-Mounted Operators: Fabricated from 0.125 inch thick extruded or formed aluminum; manufacturer's standard width; with enclosed end caps, provision for maintenance access, and fasteners concealed when door is in closed position.
- G. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonstaining, nonferrous shims for aligning system components.
- H. Operation: Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.19. When not in automatic mode, door operator shall function as manual door closer, with or without electrical power.
- I. Features:
1. Adjustable opening and closing speed.
  2. Adjustable opening and closing force.
  3. Adjustable backcheck.
  4. Adjustable hold-open time from zero to 30 seconds.
  5. Adjustable time delay.
  6. Adjustable acceleration.
  7. Obstruction recycle.
  8. On-off/hold-open switch to control electric power to operator; key operated unless indicated otherwise.
- J. Exposed Finish:
1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  2. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
  3. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
  4. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.
  5. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- K. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by qualified testing agency.
1. Fire-Door Package: UL-listed latch mechanism, power-reset box, and caution signage for fire-rated doors. Latch mechanism shall allow door to swing free during automatic operation. When fire is detected, latch actuator shall cause exit hardware to latch when door closes. Provide latch actuators with fail-secure design.

- L. Actuating Controls: Formed stainless steel plate, satin finish; with depressed marking; 2 required per opening. Handicapped symbol, filled blue.
  - 1. Activation Switch Plate: ADA compliant, Type 304 stainless steel, 4-1/2 inch round cover plate, with brushed finish. Provide weather-resistant units at exterior applications.
    - a. Basis-of-Design Product: Subject to compliance with requirements, provide 4R Series Round Switch by Wikk Industries Inc. or approved substitution.
    - b. Engraved Pictorial: Engraved universal handicap symbol with "PUSH TO OPEN" lettering with blue infill.
    - c. Switch Mechanism: Single pole double throw (SPDT) snap-action switch, UL labeled for 15 amp, 120 VAC.
  - 2. Surface Mounts: 7-1/4 inch round by 1-13/64 inch deep escutcheon plate fabricated from Type 304 stainless steel with brushed finish to match activation switch plate.
    - a. Basis-of-Design Product: Subject to compliance with requirements, provide WKS-4 by Wikk Industries Inc. or approved substitution.

2.16 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16; polished cast brass, bronze, or aluminum base metal
  - 1. Manufacturers: Where indicated in door and hardware schedules, provide specified products from one of the following:
    - a. Door Controls International, Inc.
    - b. Hager Companies.
    - c. IVES Hardware; an Allegion company.
    - d. McKinney Products Company; an ASSA ABLOY Group company.
    - e. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - f. Trimco.

B. Wall-Mounted Stops:

	<u>DCI</u>	<u>Hager</u>	<u>Ives</u>	<u>Rockwood</u>	<u>Trimco</u>
Convex	3210	232W	WS401CVX	406	1270CX
Concave	3211	236W	WS401CCV	409	1270CV
Extended	3260X	255W	WS11	518	1208
Wall Holder	3487X	326W	WS40	490	1254

C. Overhead Stops and Holders: BHMA A156.8.

- 1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
  - a. Glynn-Johnson; an Allegion company.
  - b. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
  - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

	<u>Glynn-Johnson</u>	<u>Rixson</u>	<u>Rockwood</u>	<u>Sargent</u>
Standard Duty Surface	GJ-450	10-Series	OH1100	1701
- 2. Provide overhead stop for doors that are capable of swinging more than 145 degrees before striking wall and where door strikes fixed object such as sink, cabinet, and similar obstructions.

- D. Install surface-mounted stops and holders using only manufacturer supplied template machine screws for metal doors and manufacturer supplied wood screws for wood doors. Use of self-drilling or self-tapping fasteners is not allowed.
- E. Coordinate with door supplier to provide proper blocking for surface mounting. Use of through-bolts is not acceptable.

2.17 ELECTROMAGNETIC STOPS AND HOLDERS

- A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; wall-mounted or floor-mounted electromagnetic units with strike plate attached to swinging door; coordinated with fire detectors and interface with fire alarm system for labeled fire-rated door assemblies.
  - 1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. LCN Closers; an Allegion company.
    - b. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

	<u>LCN</u>	<u>Rixson</u>	<u>Sargent</u>
Flush-Mount	SEM7850	FM998	1561
Surface-Mount	SEM7830	FM996	1560

- 2. UL listed, triple voltage, field-selectable units. Provide extension pieces as required to meet wall conditions.

2.18 DOOR GASKETING

- A. Gaskets and sweeps for aluminum doors are specified in Section 084113 – Aluminum Entrances and Storefronts.
- B. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested per ASTM E283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
  - 1. Products: Subject to compliance with requirements, provide products by one of the following:
    - a. Hager Companies.
    - b. KN Crowder Manufacturing.
    - c. National Guard Products.
    - d. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - e. Reese Enterprises, Inc.
    - f. Zero International.
  - 2. Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms and rim exit strikes.
    - a. Exterior Doors: Provide continuous gaskets. Install using non-corrosive fasteners.
    - b. Interior Doors: Provide smoke, light, or sound gasketing as scheduled.
    - c. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.

Polyprene/Alum. HD

<u>Hager</u>	<u>KNCrowder</u>	<u>NGP</u>	<u>Pemko</u>	<u>Reese</u>	<u>Zero</u>
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881S                  W-20N                  700NA                  2891APK                  755A                  429A

C. Smoke Gaskets: Concealed, adhesive backed, silicone gasketing, complying with UL 1784 for interior fire-rated openings.

1. Products: Subject to compliance with requirements, provide products by one of the following:
  - a. Hager Companies.
  - b. KN Crowder Manufacturing.
  - c. National Guard Products.
  - d. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
  - e. Reese Enterprises, Inc.
  - f. Zero International.
2. Color: As selected by Architect from manufacturer's full color range.

<u>Hager</u>	<u>KNCrowder</u>	<u>NGP</u>	<u>Pemko</u>	<u>Reese</u>	<u>Zero</u>
726S	W-22	5050C	S88	638	188S

D. Door Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.  
 Brush-Type w/Rain Drip

<u>Hager</u>	<u>KNCrowder</u>	<u>NGP</u>	<u>Pemko</u>	<u>Reese</u>	<u>Zero</u>
NA	W-35-1	C627A	3452CNB	354C	8198AA

E. Rain Drips:

<u>Hager</u>	<u>KNCrowder</u>	<u>NGP</u>	<u>Pemko</u>	<u>Reese</u>	<u>Zero</u>
810S	W-3	16A	346C	R201C	Series 148

2.19 THRESHOLDS

A. Thresholds: BHMA A156.21; full saddle, fabricated to full width of opening indicated. Provide thresholds with slip-resistant surface similar to PemKote by Pemko.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. McKinney Products Company; an ASSA ABLOY Group company.
  - b. National Guard Products.
  - c. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
  - d. Reese Enterprises, Inc.
2. Provide flat saddles at fire rated doors where combustible material is indicated on both sides.
3. Provide saddles that result in flush conditions with adjacent finish materials.

	<u>McKinney</u>	<u>National Guard</u>	<u>Pemko</u>	<u>Reese</u>
5 inch X 1/2 inch Saddle	MCK171	425	171	S205
5 inch X 1/2 inch Panic	MCK2005	896	2005	S483
5 inch X 1/4 inch	MCK271	513	271	S405
Carpet	MCK236	414	236	S565A
Heavy Duty	MCK1715	--	1715	--

2.20 METAL PROTECTIVE TRIM UNITS

- A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050 inch thick stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.
  - 1. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
    - a. Burns Manufacturing Incorporated.
    - b. Hager Companies.
    - c. Hiawatha, Inc.
    - d. IVES Hardware; an Allegion company.
    - e. Rockwood Manufacturing Company; an ASSA ABLOY Group company.
    - f. Trimco.

- B. Push Plates: Beveled edges (B4E).
  - 1. Size: 8 inch by 16 inch. Provide 4 inch by 16 inch where 8 inch by 16 inch is not applicable due to door conditions.

	<u>Burns</u>	<u>Hager</u>	<u>Hiawatha</u>	<u>Rockwood</u>	<u>Trimco</u>	<u>Ives</u>
8 inch x 16 inch 8"x16"	57	30S	200K	70F	1001-11	8200

- C. Push Plate - Pull Combination: Beveled edges (B4E), with round pulls.
  - 1. Size: 4 inch by 16 inch.
  - 2. Pulls: 1 inch diameter, 10 inch screw centers.

<u>Burns</u>	<u>Hager</u>	<u>Hiawatha</u>	<u>Rockwood</u>	<u>Trimco</u>	<u>Ives</u>
5426C	34J	200F x 536B	111 x 70C	1018-3B	8303-10

- D. Kick Plates: Beveled edges (B4E).
  - 1. Widths: 2 inches less than door width.
  - 2. Height: 12 inches or 1/2 inch less than height of bottom rail, whichever is less.

2.21 AUXILIARY DOOR HARDWARE

- A. Auxiliary Hardware: BHMA A156.16. Where indicated in hardware groups, provide the following products.
- B. Key Switches: Stainless steel single gang face plate with 12/24 V DC bi-color LED and an integral backing bracket that permits integration with any 1.125 inch or 1.25 inch mortise cylinder.
  - 1. Provide key switches for DPDT maintained action, in narrow stile designs.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Folger Adam Electric Door Controls; an ASSA ABLOY Group company.
    - b. Schlage Commercial Lock Division; an Allegion company – Locknetics.
    - c. Security Door Controls.
    - d. Securitron Magnalock Corporation; an ASSA ABLOY Group company

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## 2.22 FABRICATION

- A. **Manufacturer's Nameplate:** Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. **Base Metals:** Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- C. **Fasteners:** Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. **Concealed Fasteners:** For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is only means of securely attaching door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
  2. **Fire-Rated Applications:**
    - a. **Wood or Machine Screws:** For the following:
      - 1) Hinges mortised to doors or frames; use threaded-to-head wood screws for wood doors and frames.
      - 2) Strike plates to frames.
      - 3) Closers to doors and frames.
    - b. **Steel Through Bolts:** For the following unless door blocking is provided:
      - 1) Surface hinges to doors.
      - 2) Closers to doors and frames.
      - 3) Surface-mounted exit devices.
  3. **Spacers or Sex Bolts:** For through bolting of hollow-metal doors.
  4. **Fasteners for Wood Doors:** Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
  5. **Gasketing Fasteners:** Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## 2.23 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- C. **Appearance of Finished Work:** Variations in appearance of abutting or adjacent pieces are acceptable if they are within 1/2 of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

Exposed Metal Finishes:	BHMA 626 / US26D = Satin Chromium plated over nickel, over brass or bronze base metal. BHMA 652 / US26D = Satin Chromium plated over nickel, over steel base metal. BHMA 630 / US32D = Satin Stainless Steel, over stainless-steel base material.
Hinges-Exterior:	630 / US32D
Hinges-Interior:	652 / US26D
Continuous Gear Hinges:	AL – Clear anodized aluminum
Continuous Pin and Barrel:	630 / US32D
Locksets:	630 / US32D
Closers:	689 / AL Aluminum painted over any base material.
Exit Devices:	630 / US32D
Pushes, Pulls, Kick Plates:	630 / US32D
Armor Plates:	630 / US32D
Door Edge Guards:	630 / US32D
Overhead Stops and Holders:	630 / US32D
Door Stops:	630 / US32D
Thresholds:	AL – Mill finish aluminum
Door Gaskets:	AL – Mill finish aluminum
Sweep Strips:	AL – Mill finish aluminum
Automatic Door Bottoms:	
(Concealed)	AL – Mill finish aluminum
(Semi-Mortised)	SN – Satin nickel anodized aluminum
Rain Drips:	AL – Mill finish aluminum
Miscellaneous Items:	US26D

1. Hardware on aluminum doors shall match finish of doors and frames.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

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### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.
1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
  3. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing Work. Do not install surface-mounted items until finishes have been completed on substrates involved.
1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or 1 hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.
- E. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as indicated in keying schedule or as directed by Owner.
  2. Furnish permanent cores to Owner for installation.
- F. Key Control System:
1. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
  2. Key Lock Boxes: Install where indicated or approved by Architect to provide controlled access for fire and medical emergency personnel.
  3. Key Control System Software: Set up multiple-index system based on final keying schedule.
- G. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
1. Configuration: Provide one power supply for each door opening with electrified door hardware, with power sufficient to operate locks.
    - a. Verify voltage requirements with electrical engineer.

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2. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- H. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 079200 - Joint Sealants.
- I. Stops: Provide wall mounted stops for doors unless floor or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic. Coordinate blocking requirement with Section 061000.
1. Door Stops: Coordinate blocking requirement with Section 061000.
    - a. Position wall stops to catch lever handle or pull.
    - b. Wall Stop/ Holder: 78 inches up from finish concrete floor.
  2. Door Holders: 78 inches up from finish floor, backset same as for locks where applicable.
  3. Magnetic Wall Holders: 78 inches up from finish floor, with backset and projection as required to protect hardware from damage.
- J. Emergency Door Stop Release: 46 inches from bottom of frame to bottom of stop.
- K. Gasketing: Install prior to other surface hardware such as door closers, exit devices, and other similar items, to provide full perimeter seal without interruption. Do not notch gasketing to install oterh surface-applied hardware.
1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
  2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
  3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- L. Door Closers: Install closers using manufacturer-furnished template machine screws for metal doors and manufacturer-furnished wood screws for wood doors. Use of self-drilling or self-tapping fasteners is not allowed. Coordinate with door supplier to provide proper blocking for surface mounting. Use of through-bolts is not acceptable.
1. Corridor Doors: Mount on room side.
  2. Stairway Doors: Mount on room side.
  3. Lobby Doors: Mount on vestibule side.
  4. Exterior doors: Parallel rigid arm installation.
- M. Push Plates: Mount push plates at the following distances.
1. 1/2 inch: Distance from edge of door to edge of push plate on double acting doors and pairs of doors.
  2. 1 inch: Distance from edge of door to edge of push plate on single acting doors.
  3. 45 inches: Bottom of frame to center line of push plate.
- N. Push Bars and Pulls:
1. 42 inches: Bottom of frame to center line of push bar.
  2. 45 inches: Top bolt or screws (backset same as for locks).
  3. Where pull-mounting interferes with outside cylinder function, off-set pull horizontally on door to allow for cylinder to function.
- O. Kick Plates, Armor Plates, Diamond Plates: Bottom within 1/8 inch of door bottom; attach with Phillips head screws.

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- P. Door Guards: Apply on single acting doors to stop side of hinge edge of door and covering both edges on double acting doors. Place bottom 1/8 inch from bottom of door.
  - Q. Coat Hooks: 48 inches from finish floor on door centerline.
  - R. Low Energy Operator Wall Switches: Comply with the following for installing actuating control switches:
    - 1. Mount between 30 inches and 36 inches above finished floor.
    - 2. Locate at least 30 inches to 60 inches from pull arc of swing of door but never more than 12 feet.
    - 3. Remain accessible from swing side when door is opened.
    - 4. Do not locate where user would be in path of moving door.

### 3.4 FIELD QUALITY CONTROL

- A. Independent Architectural Hardware Consultant: Owner will engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
  - 1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed Work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

### 3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
  - 2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.
  - 3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
- B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, schedule Installer's Architectural Hardware Consultant to examine and readjust each item of door hardware, including operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

### 3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

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### 3.7 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.

### 3.8 DEMONSTRATION

- A. Engage factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

### 3.9 DOOR HARDWARE SCHEDULE, GENERAL

- A. Provide door hardware items in type, quality, and quantities as specified, appropriate for intended service unless additional hardware is required for complete and operable facility. These items may include special templates, wiring diagrams, shim kits for exit devices, filler bars and door closer arm mounting brackets for bar type coordinators, drop plates or other door closer accessory items, special fasteners required for attachment of hardware to doors, frames, or other substrates.
- B. Ensure completeness, proper function, and proper application of hardware for each door. Where hardware items are not definitely or correctly specified and are required for intended service, or if information is unclear or conflicting, direct such omission, error, or other discrepancy to Architect prior to Bid date. Architect will issue clarifications by addendum.
  - 1. Coordinate with other related Sections prior to ordering materials.
- C. Refer to door schedule for hardware sets required at each door opening. Ignore hardware sets not used on door schedule.

### 3.10 DOOR HARDWARE SCHEDULE, SETS

- 1. MK - McKinney
- 2. MR - Markar
- 3. RO - Rockwood
- 4. RU - Corbin Russwin
- 5. HS - HES
- 6. RF - Rixson
- 7. NO - Norton
- 8. PE - Pemko
- 9. OT - Other
- 10. SU - Securitron

**Hardware Sets**

**Set: 1.0**

2 Continuous Hinge	FM100	628	MR
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 K157ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
2 Surface Closer	DC6210 A11 x BRKTS REQ'D	689	RU
1 Threshold	171A		PE
1 Mullion Gasketing	5110BL		PE
1 Set Weatherstrip	BY DOOR MANUFACTURER		00

**Set: 2.0**

1 Continuous Hinge	FM100	628	MR
1 Elect Continuous Hinge	ETAP EL FM100	628	MR
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 EO	630	RU
1 Exit Device	ED5200 K157ET M92 MELR	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
2 Surface Closer	DC6210 A11 x BRKTS REQ'D	689	RU
1 Threshold	171A		PE
1 Mullion Gasketing	5110BL		PE
1 Set Weatherstrip	BY DOOR MANUFACTURER		00
1 ElectroLynx Harness	QC-C1500P (@ JAMB)		MK
1 ElectroLynx Harness	QC-C000P x LAR		MK
1 Card Reader	FURNISHED IN OTHER SECTION		OT
1 Power Supply	AQD AS REQUIRED		SU
1 Wiring Diagram	AS REQUIRED		OT

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PRESENTATION OF AUTHORIZED CREDENTIAL SIGNALS LATCH RETRACTION AND ALLOWS INGRESS. EGRESS BY EXIT DEVICE PUSH BAR AT ALL TIMES.

**Set: 3.0**

2 Continuous Hinge	FM100	628	MR
2 Elect Continuous Hinge	ETAP EL FM100	628	MR
1 Keyed Removable Mullion	900BKM		RU

1 Exit Device	ED5200 EO	630	RU
1 Exit Device	ED5200 K157ET M92 MELR	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
1 Surface Closer	DC6210 A11 x BRKTS REQ'D	689	RU
1 Automatic Opener	6060/6070	689	NO
1 Threshold	171A		PE
1 Mullion Gasketing	5110BL		PE
1 Set Weatherstrip	BY DOOR MANUFACTURER		00
1 ElectroLynx Harness	QC-C1500P (@ JAMB)		MK
1 ElectroLynx Harness	QC-C000P x LAR		MK
1 Card Reader	FURNISHED IN OTHER SECTION		OT
2 Door Switch	506		NO
1 Power Supply	AQD AS REQUIRED		SU
1 Wiring Diagram	AS REQUIRED		OT

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PRESENTATION OF AUTHORIZED CREDENTIAL SIGNALS LATCH RETRACTION AND CYCLES AUTOMATIC OPERATOR ALLOWING INGRESS. EGRESS BY EXIT DEVICE PUSH BAR AT ALL TIMES.

**Set: 4.0**

Hinge	T4A3386 x NRP	US32D	MK
1 Exit Device	ED5200 L957ET	630	RU
1 Cylinder	AS REQUIRED	626	RU
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom Sweep	3452CNB		PE

**Set: 4.1**

<b>Hinge</b>	<b>T4A3386 x NRP</b>	<b>US32D</b>	<b>MK</b>
<b>1 Exit Device</b>	<b>ED5200 L957ET</b>	<b>630</b>	<b>RU</b>
<b>1 Cylinder</b>	<b>AS REQUIRED</b>	<b>626</b>	<b>RU</b>
<b>1 Surface Closer</b>	<b>DC6210 A3</b>	<b>689</b>	<b>RU</b>
<b>1 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>1 Door Stop</b>	<b>406/441CU</b>	<b>US26D</b>	<b>RO</b>
<b>1 Threshold</b>	<b>2005AT</b>		<b>PE</b>
<b>1 Set Weatherstrip</b>	<b>303AS</b>		<b>PE</b>
<b>1 Rain Guard</b>	<b>346C</b>		<b>PE</b>
<b>1 Door Bottom Sweep</b>	<b>3452CNB</b>		<b>PE</b>
<b>1 Hardware</b>	<b>SEE NOTE BELOW</b>		<b>OT</b>

**NOTE: DOOR TO SWING 180 DEGRESS WHERE INDICATED ON PLANS.**

**Set: 5.0**

Hinge	T4A3386 x NRP	US32D	MK
1 Exit Device	ED5200 K157ET	630	RU
1 Cylinder	AS REQUIRED	626	RU
1 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom Sweep	3452CNB		PE

**Set: 6.0**

Hinge	T4A3386 x NRP	US32D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 L957ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Mullion Gasketing	5110BL		PE
2 Door Bottom Sweep	3452CNB		PE

**Set: 6.1**

<b>Hinge</b>	<b>T4A3386 x NRP</b>	<b>US32D</b>	<b>MK</b>
<b>1 Keyed Removable Mullion</b>	<b>900BKM</b>		<b>RU</b>
<b>1 Exit Device</b>	<b>ED5200 L957ET</b>	<b>630</b>	<b>RU</b>
<b>1 Exit Device</b>	<b>ED5200 EO</b>	<b>630</b>	<b>RU</b>
<b>2 Cylinder</b>	<b>AS REQUIRED</b>	<b>626</b>	<b>RU</b>
<b>2 Surface Closer</b>	<b>DC6210 A3</b>	<b>689</b>	<b>RU</b>
<b>2 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>2 Door Stop</b>	<b>406/441CU</b>	<b>US26D</b>	<b>RO</b>
<b>1 Threshold</b>	<b>2005AT</b>		<b>PE</b>
<b>1 Set Weatherstrip</b>	<b>303AS</b>		<b>PE</b>
<b>1 Rain Guard</b>	<b>346C</b>		<b>PE</b>
<b>1 Mullion Gasketing</b>	<b>5110BL</b>		<b>PE</b>

<b>2 Door Bottom Sweep</b>	<b>3452CNB</b>	<b>PE</b>
<b>1 Hardware</b>	<b>SEE NOTE BELOW</b>	<b>OT</b>

**NOTE: DOOR TO SWING 180 DEGRESS WHERE INDICATED ON PLANS.**

**Set: 7.0**

Hinge	T4A3386 x NRP	US32D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 K157ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Mullion Gasketing	5110BL		PE
2 Door Bottom Sweep	3452CNB		PE

**Set: 8.0**

Hinge	TA2314	US32D	MK
1 Apartment Lock	ML2067 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Threshold	171A		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom	222APK		PE

**Set: 9.0**

Hinge	TA2314 x NRP	US32D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom Sweep	3452CNB		PE
1 Hardware	SEE NOTE BELOW		OT

NOTE: DOOR 238A - FREE EGRESS FROM ROOF AT ALL TIMES.

**Set: 10.0**

Hinge	TA2314 x NRP	US32D	MK
1 Storeroom Security Lock	ML2059 LWA	630	RU
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom Sweep	3452CNB		PE

**Set: 11.0**

Hinge	T4A3386	US32D	MK
1 Classroom Intruder Lock	ML2072 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	171A		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
1 Door Bottom	222APK		PE

**Set: 12.0**

Hinge	T4A3386 x NRP	US32D	MK
1 Set Combo Flush Bolts	2845/2945	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Lock	ML2057 LWA	630	RU
1 Coordinator	2600 x FILLER BAR x CLOSER MTG BRKTS AS REQ'D	Black	RO
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
2 Door Bottom Sweep	3452CNB		PE
1 Set Astragal	18041CNB		PE

NOTE: DOOR G007 - FREE EGRESS FROM ROOF AT ALL TIMES.

**Set: 13.0**

Hinge	T4A3386 x NRP	US32D	MK
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1 Set Combo Flush Bolts	2845/2945	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Security Lock	ML2059 LWA	630	RU
1 Coordinator	2600 x FILLER BAR x CLOSER MTG BRKTS AS REQ'D	Black	RO
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Threshold	2005AT		PE
1 Set Weatherstrip	303AS		PE
1 Rain Guard	346C		PE
2 Door Bottom Sweep	3452CNB		PE
1 Set Astragal	18041CNB		PE

**Set: 14.0**

1 Continuous Hinge	FM100	628	MR
1 Storeroom Lock	ML2057 LWA	630	RU
1 Electric Strike	1006-LBM	630	HS
1 SMART Pac Bridge Rectifier	2005M3		HS
1 Surface Closer	DC6210 A11 x BRKTS REQ'D	689	RU
1 Door Seals	BY DOOR MANUFACTURER		00
1 ElectroLynx Harness	QC-C1500P (@ JAMB)		MK
1 Card Reader	FURNISHED IN OTHER SECTION		OT
1 Power Supply	AQD AS REQUIRED		SU
1 Wiring Diagram	AS REQUIRED		OT

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF AUTHORIZED CREDENTIAL RELEASES ELECTRIC STRIKE ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

**Set: 15.0**

Hinge	T4A3786	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 L955ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A14	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
2 Door Stop	406/441CU	US26D	RO

1 Mullion Gasketing	5110BL		PE
2 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 16.0**

2 Continuous Hinge	FM100	628	MR
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 K157ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
2 Surface Closer	DC6210 A11 x BRKTS REQ'D	689	RU
1 Mullion Gasketing	5110BL		PE
1 Door Seals	BY DOOR MANUFACTURER		00

**Set: 17.0**

Hinge	TA2714	US26D	MK
1 Exit Device	ED5200 L957ET	630	RU
1 Cylinder	AS REQUIRED	626	RU
1 Door Closer	DC6210	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals	S88D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 17.1**

Hinge	TA2714	US26D	MK
<b>1 Set Combo Flush Bolts</b>	<b>2845/2945</b>	<b>US26D</b>	<b>RO</b>
<b>1 Dust Proof Strike</b>	<b>570</b>	<b>US26D</b>	<b>RO</b>
<b>1 Exit Device</b>	<b>ED5470 L957ET M55</b>	<b>630</b>	<b>RU</b>
<b>1 Cylinder</b>	<b>AS REQUIRED</b>	<b>626</b>	<b>RU</b>
<b>1 Door Closer</b>	<b>DC6210</b>	<b>689</b>	<b>RU</b>
<b>2 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>2 Door Stop</b>	<b>406/441CU</b>	<b>US26D</b>	<b>RO</b>
<b>1 Set Door Seals</b>	<b>S773D</b>		<b>PE</b>
<b>2 Auto Door Bottom</b>	<b>411ARL</b>		<b>PE</b>
<b>1 Set Astragal</b>	<b>18041CNB</b>		<b>PE</b>

**Set: 18.0**

Hinge	TA2714	US26D	MK
1 Exit Device	ED5200 L957ET	630	RU
1 Cylinder	AS REQUIRED	626	RU

1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 18.1**

<b>Hinge</b>	<b>TA2714</b>	<b>US26D</b>	<b>MK</b>
<b>1 Exit Device</b>	<b>ED5200A L955ET</b>	<b>630</b>	<b>RU</b>
<b>1 Cylinder</b>	<b>AS REQUIRED</b>	<b>626</b>	<b>RU</b>
<b>1 Surface Closer</b>	<b>DC6210 A4</b>	<b>689</b>	<b>RU</b>
<b>1 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>1 Set Door Seals/Silencers</b>	<b>S88D/608 AS REQUIRED</b>		<b>PE</b>

**Set: 19.0**

Hinge	TA2714	US26D	MK
1 Exit Device	ED5200 K157ET	630	RU
1 Cylinder	AS REQUIRED	626	RU
1 Flush Pull	BF97 x SIZE TO BE DETERMINED	US32D	RO
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 20.0**

Hinge	TA2714	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 L957ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Door Closer	DC6210	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
2 Door Stop	406/441CU	US26D	RO
1 Mullion Gasketing	5110BL		PE
1 Set Door Seals	S773D		PE
2 Auto Door Bottom	411ARL		PE

**Set: 21.0**

Hinge	T4A3786	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200A L955ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A3	689	RU

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2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
2 Door Stop	406/441CU	US26D	RO
1 Mullion Gasketing	5110BL		PE
2 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 22.0**

Hinge	T4A3786	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 L955ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A5	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Mullion Gasketing	5110BL		PE
2 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 23.0**

Hinge	T4A3786	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200 L955ET	630	RU
1 Exit Device	ED5200 EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Mullion Gasketing	5110BL		PE
2 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 24.0**

Hinge	T4A3786	US26D	MK
1 Keyed Removable Mullion	900BKM		RU
1 Exit Device	ED5200A L955ET	630	RU
1 Exit Device	ED5200A EO	630	RU
2 Cylinder	AS REQUIRED	626	RU
2 Surface Closer	DC6210 A3	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
2 Electromagnetic Holder (Floor Mount)	980 SERIES	689	RF
1 Mullion Gasketing	5110BL		PE
1 Set Door Seals	S88D		PE
1 Hardware	SEE NOTE BELOW		OT

NOTE: ELECTROMAGNETIC HOLDERS TO BE TIED INTO FIRE ALARM SYSTEM.

NOTE: DOOR TO SWING 180 DEGREES WHERE INDICATED ON FLOOR PLANS.

**Set: 25.0**

Hinge	TA2714	US26D	MK
1 Passage Set	ML2010 LWA	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals	S773D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 26.0**

Hinge	TA2714	US26D	MK
1 Privacy Lock	ML2060 LWA M34	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 27.0**

Hinge	TA2714	US26D	MK
1 Passage Latch w/Indicator	ML2040 LWA M34 V21	630	RU
1 Door Stop	406/441CU	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 28.0**

Hinge	TA2714	US26D	MK
1 Privacy Lock	ML2060 LWA M34 V21	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 28.1**

Hinge	TA2714	US26D	MK
1 Privacy Lock	ML2060 LWA M34 V21	630	RU
1 Door Closer	DC6210	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 28.2**

<b>Hinge</b>	<b>TA2714</b>	<b>US26D</b>	<b>MK</b>
<b>1 Privacy Lock</b>	<b>ML2060 LWA M34 V21</b>	<b>630</b>	<b>RU</b>
<b>1 Surface Closer</b>	<b>DC6210 A4</b>	<b>689</b>	<b>RU</b>
<b>1 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>1 Set Door Seals/Silencers</b>	<b>S88D/608 AS REQUIRED</b>		<b>PE</b>

**Set: 29.0**

Hinge	TA2714	US26D	MK
1 Office Lock	ML2051 LWA	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 30.0**

Hinge	TA2714	US26D	MK
1 Office Lock	ML2051 LWA	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals	S773D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 31.0**

Hinge	TA2714	US26D	MK
1 Office Lock	ML2051 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 32.0**

Hinge	TA2714	US26D	MK
1 Office Lock	ML2051 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals	S773D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 33.0**

Hinge	TA2714	US26D	MK
1 Office Lock	ML2051 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 34.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 35.0**

Hinge	T4A3786	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 36.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 37.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals	S773D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 38.0**

Hinge	T4A3786	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Overhead Holder	10 SERIES	630	RF
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 39.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO

1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 40.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 41.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Door Closer	DC6210	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 42.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Surface Closer	DC6210 A2	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 43.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU
1 Surface Closer	DC6210 A5	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 44.0**

Hinge	TA2714	US26D	MK
1 Classroom Lock	ML2055 LWA	630	RU

1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 45.0**

Hinge	TA2714	US26D	MK
1 Apartment Lock	ML2067 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 46.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 47.0**

Hinge	T4A3786	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 48.0**

Hinge	TA2314	US32D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Holder	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 49.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 50.0**

Hinge	T4A3786	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 51.0**

Hinge	T4A3786	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 51.1**

<b>Hinge</b>	<b>TA2714</b>	<b>US26D</b>	<b>MK</b>
<b>1 Storeroom Lock</b>	<b>ML2057 LWA</b>	<b>630</b>	<b>RU</b>
<b>1 Overhead Stop</b>	<b>10 SERIES</b>	<b>630</b>	<b>RF</b>
<b>1 Door Closer</b>	<b>DC6200</b>	<b>689</b>	<b>RU</b>
<b>1 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>1 Set Door Seals/Silencers</b>	<b>S88D/608 AS REQUIRED</b>		<b>PE</b>

**Set: 52.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Door Closer	DC6210	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 53.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 54.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 54.1**

<b>1 Continuous Hinge</b>	<b>FM100</b>	<b>628</b>	<b>MR</b>
<b>1 Storeroom Lock</b>	<b>ML2057 LWA</b>	<b>630</b>	<b>RU</b>
<b>1 Door Stop</b>	<b>406/441CU</b>	<b>US26D</b>	<b>RO</b>
<b>1 Door Seals</b>	<b>BY DOOR MANUFACTURER</b>		<b>00</b>

**Set: 55.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 56.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 57.0**

Hinge	TA2714	US26D	MK
1 Storeroom Lock	ML2057 LWA	630	RU
1 Overhead Stop	10 SERIES	630	RF
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 58.0**

Hinge	TA2714	US26D	MK
1 Classroom Intruder Lock	ML2072 LWA	630	RU
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO

1 Set Door Seals	S773D		PE
1 Auto Door Bottom	411ARL		PE

**Set: 59.0**

Hinge	TA2714	US26D	MK
1 Set Auto Flush Bolts	2842/2942	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Classroom Lock	ML2055 LWA	630	RU
1 Coordinator	2600 x FILLER BAR x CLOSER MTG BRKTS AS REQ'D	Black	RO
1 Overhead Stop	10 SERIES	630	RF
2 Door Closer	DC6200	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 59.1**

<b>Hinge</b>	<b>TA2714</b>	<b>US26D</b>	<b>MK</b>
<b>1 Set Combo Flush Bolts</b>	<b>2845/2945</b>	<b>US26D</b>	<b>RO</b>
<b>1 Dust Proof Strike</b>	<b>570</b>	<b>US26D</b>	<b>RO</b>
<b>1 Classroom Lock</b>	<b>ML2055 LWA</b>	<b>630</b>	<b>RU</b>
<b>1 Coordinator</b>	<b>2600 x FILLER BAR x CLOSER MTG BRKTS AS REQ'D</b>	<b>Black</b>	<b>RO</b>
<b>2 Overhead Stop</b>	<b>10 SERIES</b>	<b>630</b>	<b>RF</b>
<b>2 Door Closer</b>	<b>DC6200</b>	<b>689</b>	<b>RU</b>
<b>2 Kick Plate</b>	<b>K1050 8" 3BE CSK</b>	<b>US32D</b>	<b>RO</b>
<b>2 Set Door Seals/Silencers</b>	<b>S88D/608 AS REQUIRED</b>		<b>PE</b>

**Set: 60.0**

Hinge	TA2714	US26D	MK
1 Set Combo Flush Bolts	2845/2945	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Lock	ML2057 LWA	630	RU
1 Coordinator	2600 x FILLER BAR x CLOSER MTG BRKTS AS REQ'D	Black	RO
2 Overhead Stop	10 SERIES	630	RF
2 Door Closer	DC6200	689	RU
2 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Set Door Seals	S88D		PE

2 Auto Door Bottom	411ARL		PE
1 Set Astragal	18041CNB		PE

**Set: 61.0**

Hinge	TA2714	US26D	MK
1 Push Plate	70F	US32D	RO
1 Pull Plate	111x70C	US32D	RO
1 Door Closer	DC6200	689	RU
1 Kick Plate	K1050 8" 3BE CSK	US32D	RO
1 Door Stop	406/441CU	US26D	RO
1 Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

**Set: 62.0**

1 Cylinder	AS REQUIRED	626	RU
1 Hardware	SEE NOTE BELOW		OT

NOTE: OVERHEAD DOOR - BALANCE OF HARDWARE FURNISHED IN OTHER SECTION BY DOOR MANUFACTURER.

END OF SECTION 087100

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SECTION 088853 - SECURITY GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes laminated glass for the following applications:
  - 1. Windows
  - 2. Doors.
  - 3. Glazed entrances.
  - 4. Storefront framing.
  - 5. Interior borrowed lites.

1.2 DEFINITIONS

- A. Glazing Manufacturers: Firms that produce primary glass, monolithic plastic glazing, or fabricated security glazing, as defined in referenced glazing publications.
- B. Interspace: Space between lites of air-gap security glazing or insulating security glazing.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on security glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for security glazing during and after installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Security Glazing Samples: For each type of security glazing; 12 inches square.
- C. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Security Glazing Schedule: List security glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of security glazing and construction that receives security glazing, including clearances and glazing channel dimensions.
- E. Delegated-Design Submittal: For security glazing indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

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#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installers.
- B. Product Certificates: For each type of product indicated, from manufacturer.
- C. Product Test Reports: For each type of security glazing, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Product Test Reports: For each type of glazing sealant, for tests performed by a qualified testing agency.
  - 1. Provide test reports based on testing current sealant formulations within previous 36-month period.
- E. Preconstruction adhesion and compatibility test reports.
- F. Sample Warranties: For special warranties.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating Security Glazing Units with Sputter-Coated, Low-E Coatings: A qualified insulating glazing manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glazing installers for this Project who are certified under the National Glass Association Glazier Certification Program.
- C. Security Glazing Testing Agency Qualifications: Subject to compliance with requirements, testing agency is one of the following:
  - 1. H. P. White Laboratory, Inc.
  - 2. Underwriters Laboratories, Inc.
  - 3. Wiss, Janney, Elstner Associates, Inc.
- D. Sealant Testing Agency Qualifications: Qualified according to ASTM C1021 for testing indicated.
- E. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Install security glazing in mockups specified in Section 084113 "Aluminum-Framed Entrances and Storefronts" and Section 084413 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each security glazing type, tape sealant, gasket, glazing accessory, and glazing-framing member for adhesion to and compatibility with elastomeric glazing sealants.
  - 1. Testing will not be required if data based on previous testing of current sealant products and glazing materials match those submitted.

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## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect security glazing and glazing materials according to manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating security glazing and with air-gap security glazing manufacturers' written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

## 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

## 1.11 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer agrees to replace laminated glass that deteriorates within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Security Glazing: Manufacturer agrees to replace insulating security glazing that deteriorates within specified warranty period. Deterioration of insulating security glazing is defined as defects in individual lites developed from normal use or failure of hermetic seal under normal use. Deterioration does not include defects in individual lites or failure of hermetic seal that is attributed to glass breakage or to maintaining and cleaning insulating security glazing contrary to manufacturer's written instructions.
  - 1. Defects in coated-glass lites include peeling, cracking, and other indications of deterioration in coating.
  - 2. Defects in laminated-glass lites include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 3. Defects in glass-clad polycarbonate lites include edge separation, delamination materially obstructing vision through glazing, blemishes exceeding those allowed by referenced glass-clad polycarbonate standard, yellowing, and loss of light transmission.
  - 4. Evidence of hermetic seal failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glazing.
  - 5. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide the Basis-of-Design products as indicated in Glazing Schedule found in Part 3 of this Section.

- B. Source Limitations for Security Glazing: Obtain security glazing from single source from single manufacturer using the same types of lites, plies, interlayers, and spacers for each security glazing type indicated.
  - 1. Source Limitations for Tinted Glass: Obtain from single source from single primary glass manufacturer for each tint color indicated.
- C. Source Limitations for Glazing Sealants and Gaskets: Obtain from single source from single manufacturer for each product and installation method.

## 2.2 PERFORMANCE REQUIREMENTS

- A. General:
  - 1. Installed security glazing shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing; or other defects in construction.
  - 2. Installed security glazing shall withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014500 "Quality Control" to design security glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated.
  - 1. Design Procedure for Glass: ASTM E1300 and ICC's International Building Code.
  - 2. Design Wind Pressures: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glazing framing members and glazing components.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

## 2.3 SECURITY GLAZING, GENERAL

- A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Plastic Glazing Labeling: Identify plastic sheets with appropriate markings of applicable testing and inspecting agency, indicating compliance with required fire-test-response characteristics.
- C. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glazing, glass thickness, and safety glazing standard with which glazing complies.

- D. Insulating Glazing Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.
- E. Fire-Test-Response Characteristics of Polycarbonate Sheets: As determined by testing polycarbonate sheets identical to those used in security glazing products by a qualified testing agency acceptable to authorities having jurisdiction.
1. Self-ignition temperature of 650 deg F or more when tested according to ASTM D1929 on plastic sheets in thicknesses indicated for the Work.
  2. Smoke-Developed Index of 450 or less when tested according to ASTM E84, or smoke density of 75 or less when tested according to ASTM D2843 on plastic sheets in thicknesses indicated for the Work.
  3. Burning extent of 1 inch or less when tested according to ASTM D635 at a nominal thickness of 0.060 inch or thickness indicated for the Work.
- F. Thermal and Optical Performance Properties: Provide security glazing with performance properties specified, as indicated in manufacturer's published test data, based on construction products indicated and on procedures indicated below:
1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
  2. Solar-Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
  3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
  2. For heat-strengthened float glass, comply with requirements for Kind HS.
  3. For fully tempered float glass, comply with requirements for Kind FT.
  4. For uncoated glass, comply with requirements for Condition A.

## 2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  2. Interlayer Color: Clear unless otherwise indicated.

## 2.6 INSULATING SECURITY GLAZING

- A. Insulating Security Glazing: Factory-assembled units, consisting of sealed lites of glazing material indicated separated by a dehydrated interspace, qualified according to ASTM E2190
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
  2. Spacer: Manufacturer's standard spacer material and construction.

3. Desiccant: Molecular sieve or silica gel, or blend of both.

## 2.7 GLAZING SEALANTS

### A. General:

1. **Compatibility:** Provide glazing sealants that are compatible with one another and with other materials they contact, including security glazing, seals of insulating security glazing and air-gap security glazing, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. **Suitability:** Comply with sealant and security glazing manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. **Colors of Exposed Glazing Sealants:** As selected by Architect from manufacturer's full range.
- B. **Security Sealant:** Manufacturer's standard, nonsag, tamper-resistant sealant for joints with low movement complying with ASTM C920, Grade NS, Class 12.5 or 25, Use NT, and with a Shore A hardness of at least 45 when tested according to ASTM C661.

## 2.8 GLAZING TAPES

- A. **Back-Bedding Mastic Glazing Tapes:** Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and security glazing manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. **Expanded Cellular Glazing Tapes:** Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.9 MISCELLANEOUS GLAZING MATERIALS

- A. **General:** Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of security glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. **Cleaners, Primers, and Sealers:** Types recommended by sealant or gasket manufacturer.
- C. **Setting Blocks:** Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. **Spacers:** Elastomeric blocks or continuous extrusions of hardness required by security glazing manufacturer to maintain security glazing lites in place for installation indicated.
- E. **Edge Blocks:** Elastomeric material of hardness needed to limit security glazing lateral movement (side walking).

- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## 2.10 FABRICATION OF SECURITY GLAZING

- A. Fabricate security glazing in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Grind smooth and polish exposed security glazing edges and corners.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing for security glazing, with Installer present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep system.
  3. Minimum required face or edge clearances.
  4. Minimum required bite.
  5. Effective sealing between joints of framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving security glazing immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of security glazing, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect edges of security glazing from damage during handling and installation. Remove damaged security glazing from Project site and legally dispose of off Project site. Damaged security glazing includes units with edge or face damage or other imperfections that, when installed, could weaken security glazing and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

- 
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glazing unit manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
  - E. Do not exceed edge pressures stipulated by security glazing manufacturers for installing lites.
  - F. Provide spacers for security glazing lites where the length plus width is larger than 50 inches.
    - 1. Locate spacers directly opposite each other on both inside and outside faces of security glazing. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with performance requirements.
    - 2. Provide 1/8-inch minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
  - G. Provide edge blocking where indicated or needed to prevent security glazing from moving sideways in glazing channel, as recommended in writing by security glazing manufacturer and according to requirements in referenced glazing publications.
  - H. Set security glazing in each series with uniform pattern, draw, bow, and similar characteristics.
  - I. Set coated security glazing with proper orientation so that coatings and films face exterior or interior as specified.
  - J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
  - K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

#### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by security glazing, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center security glazing in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

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- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket securely in place between glazing unit and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center security glazing in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center security glazing in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between security glazing and glazing stops to maintain face clearances and to prevent sealant from extruding into glazing channel and blocking weep systems. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to security glazing and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial washaway from security glazing.

### 3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect security glazing from contact with contaminating substances resulting from construction operations, including weld splatter. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
1. If, despite such protection, contaminating substances do come into contact with security glazing, remove substances immediately as recommended in writing by security glazing manufacturer. Remove and replace security glazing that cannot be cleaned without damage.
- C. Wash security glazing on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash security glazing as recommended in writing by security glazing manufacturer.

## 3.8 LAMINATED-GLASS SECURITY GLAZING SCHEDULE

## A. Security Glazing: Clear laminated glass – SG.

1. Basis of Design Product: Subject to compliance with requirements, provide LTI Smart Glass, “School Guard Glass SG4 IGU” or a comparable product by one of the following:
  - a. Global Security Glazing.
  - b. LTI Smart Glass
  - c. Pilkington USA.
2. Forced-Entry Resistance: Level II according to HPW-TP-0500.03.
3. Ballistic Resistance: Class/Level HG3 according to ASTM F1233.
4. Ballistic Resistance: Level 2 according to UL 752.
5. Maximum Overall Unit Thickness: 1-1/16 inch.
6. Number of Plies: Three.
7. Outer Ply: 6-mm. coated glass
  - a. SunGuard SuperNeutral SN 68 Low e coating on surface #2
  - b. Innerspace Content: Air with 3/8 inch spacer.
8. Inner ply: Laminated configuration.
  - a. Basis of Design: School Guard Glass SG 4
9. Visible Light Transmittance: 0.49 percent.
10. U-Factor: 0.30 maximum.
11. Solar-Heat-Gain Coefficient: 0.24 maximum.
12. Provide safety glazing labeling.

END OF SECTION 088853

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**SECTION 123553 – LABORATORY CASEWORK****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Wood laboratory casework and shelves.
  2. Laboratory epoxy countertops.
  3. Laboratory sinks and troughs.
  4. Laboratory accessories.
  5. Water, electrical service fittings and data connections.

**1.2 DEFINITIONS**

- A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.
1. Ends of cabinets, including those installed directly against walls or other cabinets, are defined as "exposed."
  2. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets are defined as "concealed."
- B. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cabinets 78 inches or more above floor are defined as "semiexposed."
- C. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.
- D. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, joined with adhesive and faced both front and back with hardwood veneers.

**1.3 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
1. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.
  2. Coordinate installation of laboratory casework with installation of fume hoods and other laboratory equipment.
  3. Coordinate and provide piping and conduit connections from rough-in point to fixtures.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 – Project Management and Coordination.
- C. Keying Conference: Conduct conference at Project site. Incorporate keying conference decisions into final keying requirements.

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#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For laboratory casework. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Indicate locations of hardware and keying of locks.
  - 2. Indicate locations and types of service fittings.
  - 3. Indicate locations of blocking and reinforcements required for installing laboratory casework.
  - 4. Include details of utility spaces showing supports for conduits and piping.
  - 5. Include details of exposed conduits, if required, for service fittings.
  - 6. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
  - 7. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Samples for Verification: Unless otherwise directed, approved full-size Samples may become part of the completed Work, if in an undisturbed condition at time of Substantial Completion. Notify Architect of their exact locations. If not incorporated into the Work, retain acceptable full-size Samples at Project site and remove when directed by Architect.
  - 1. One full-size, finished base cabinet complete with hardware, doors, and drawers.
  - 2. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
  - 3. One of each service fitting specified, complete with accessories and specified finish.
  - 4. One of each type of sink and accessory item specified.
  - 5. One of each type of hardware item specified.
  - 6. Maintain Samples at Project site during construction in an undisturbed condition as a standard for judging the completed Work. Unless otherwise directed, approved Sample units in an undisturbed condition at the time of Substantial Completion may become part of the completed Work. Notify Architect of their exact locations. If not incorporated into the Work, retain acceptable Sample units at Project site and remove when directed by Architect.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Test Reports for Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
- C. Product Test Reports for Epoxy Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface materials with requirements specified for chemical and physical resistance.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer that produces casework of types indicated for this Project that has been tested, by a third party independent testing agency, for compliance with SEFA 8.
- B. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes and similar door and drawer configurations and complying with the Specifications may be considered. Refer to Section 016000 "Product Requirements."

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- C. Casework Product Standard: Comply with SEFA 8, "Laboratory Furniture - Casework, Shelving and Tables - Recommended Practices."
  - D. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements in NFPA 30 by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

#### 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet work are complete and dry, and temporary HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

#### 1.9 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cabinets by Design, Inc.
  - 2. ~~Campbell Rhea~~. **ICScientific.**
  - 3. ~~E&D Specialty Stands, Inc.~~
  - 4. ~~Hamilton Laboratory Solutions LLC.~~
  - 5. Harwil Fixtures, Inc.
  - 6. Kewaunee Scientific Corporation; Laboratory Products Group.
  - 7. Leonard Peterson & Co.
  - 8. Sheldon Laboratory Systems, Inc.
  - 9. ~~Sturdisteel.~~
  - 10. ~~Wood Metal Industries.~~
  - 11. Diversified Casework
  - 12. **Mott Manufacturing Ltd.**
- B. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.

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## 2.2 WOOD CABINET AND TABLE MATERIALS

### A. General:

1. Adhesives: Do not use adhesives that contain urea formaldehyde.
2. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
3. Hardwood Plywood: HPVA HP-1, veneer core, unless otherwise indicated.
4. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch thick, solid wood of same species as face veneer.

### B. Exposed Materials:

1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
2. Wood Species: Maple.
  - a. Face Veneer Cut: Plain sliced.
3. Stain Colors and Finishes: As selected by Architect from manufacturer's full range.
4. Solid Wood: Clear hardwood lumber of species indicated and selected for grain and color compatible with exposed hardwood plywood.
5. Plywood: Hardwood plywood with face veneer of species indicated, selected for compatible color and grain. Grade A exposed faces at least 1/50 inch thick, and Grade J crossbands. Provide backs of same species as faces.

### C. Semiexposed Materials:

1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of any species similar in color and grain to exposed solid wood.
2. Plywood: Hardwood plywood of any species similar in color and grain to exposed plywood. Grade B faces, Grade J crossbands, and backs of same species as faces. Semiexposed backs of plywood with exposed faces shall be same species as faces.

### D. Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semiexposed faces shall be same species as faces.
3. Medium-density fiberboard.
4. Hardboard: AHA A135.4, Class 1 tempered.

## 2.3 AUXILIARY CABINET MATERIALS

- A. Acid Storage-Cabinet Lining: 1/4-inch thick, glass-fiber cement board complying with ASTM C 1186.
- B. Glass for Glazed Doors: Clear tempered glass complying with ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality-Q3; not less than 5.0 mm thick.

## 2.4 LABORATORY COUNTERTOP, TABLE TOP, AND SINK MATERIALS

### A. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.

1. Physical Properties:
  - a. Flexural Strength: Not less than 10,000 psi.

- b. Modulus of Elasticity: Not less than 2,000,000 psi.
  - c. Hardness (Rockwell M): Not less than 100.
  - d. Water Absorption (24 Hours): Not more than 0.02 percent.
  - e. Heat Distortion Point: Not less than 260 deg F.
2. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
    - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
    - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
  3. Color: Black.

## 2.5 WOOD CABINETS AND TABLES

- A. Design: **Lipped Flush** overlay with radiused edges.
- B. Grain Direction:
  1. Vertical on doors and drawer fronts.
  2. Lengthwise on face frame members.
  3. Vertical on end panels.
  4. Side to side on bottoms and tops of units.
  5. Vertical on knee-space panels.
  6. Vertical on aprons and table frames.
- C. Construction: Provide wood-faced laboratory casework of the following minimum construction:
  1. Bottoms of Base Cabinets and Tall Cabinets: 3/4-inch thick hardwood plywood.
  2. Tops and Bottoms of Wall Cabinets and Tops of Tall Cabinets: 3/4-inch thick veneer-core hardwood plywood.
  3. Ends of Cabinets: 3/4-inch thick hardwood plywood.
  4. Shelves: 1-inch thick veneer-core hardwood plywood at base cabinets and 1-inch thick veneer-core hardwood plywood at wall cabinets.
  5. Base Cabinet Top Frames: 3/4-by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.
  6. Base Cabinet Stretchers: 3/4-by-4-1/2-inch panel product strips or solid wood boards at front and back of cabinet, glued and pinned or screwed. May be provided as an option to base cabinet top frames.
  7. Base Cabinet Subtops: 3/4-inch- thick panel product glued and pinned or screwed. May be provided as an option to base cabinet top frames.
  8. Backs of Cabinets: 3/4-inch thick, hardwood plywood where exposed, 1/4-inch thick, hardwood plywood dadoed into sides, bottoms, and tops where not exposed.
  9. Vertical Partitions: 3/4-inch thick, hardwood plywood.
  10. Drawer Fronts: 3/4-inch thick, hardwood plywood or solid hardwood.
  11. Drawer Sides and Backs: 1/2-inch thick, solid hardwood or hardwood plywood, with glued dovetail or multiple-dowel joints.
  12. Drawer Bottoms: 1/4-inch thick, veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch thick material for drawers more than 24 inches wide.
  13. Doors 48 Inches or Less in Height: 3/4 inch thick, with medium-density fiberboard cores, solid hardwood stiles and rails, and hardwood face veneers and crossbands.
  14. Doors More Than 48 Inches High: 1-1/16 inches thick, with honeycomb cores, solid hardwood stiles and rails, and hardwood face veneers and crossbands.
  15. Stiles and Rails of Glazed Doors: 3/4-inch thick, solid hardwood.

- D. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.
1. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.
  2. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.
  3. Provide knee-space panels (modesty panels) at spaces between base cabinets, where cabinets are not installed against a wall or where space is not otherwise closed. Fabricate from same material and with same finish as exposed cabinet backs.

## 2.6 WOOD FINISH

- A. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

## 2.7 HARDWARE

- A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
- B. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors 48 inches high or less and 3 for doors more than 48 inches high.
- C. Hinged Door and Drawer Pulls: Solid aluminum, stainless steel, or chrome-plated brass back-mounted pulls. Provide 2 pulls for drawers more than 24 inches wide.
1. Design: As selected by Architect from manufacturer's full range.
  2. Overall Size: As selected from manufacturer's full range.
- D. Door Catches: Nylon-roller spring catches. Provide 2 catches on doors more than 48 inches high.
- E. Drawer Slides: Powder-coated, full-extension, self-closing, heavy-duty drawer slides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091, and rated for 100 lbf.
- F. ~~Label Holders: Stainless steel, aluminum, or chrome plated; sized to receive standard label cards approximately 1 by 2 inches, attached with screws or rivets. Provide on all drawers.~~
- G. Locks for Wood Cabinets: Cam type with 5-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281.
1. Provide a minimum of two keys per lock and two master keys.

2. Provide on all drawers and doors.
3. Keying: Key locks within each room alike, key each room separately.
4. Master Key System: Key all locks to be operable by master key.

- H. Adjustable Shelf Supports for Wood Cabinets: Clear polycarbonate, laboratory standard grade with shelf lock hold-down.
- I. Grommets for Cable Passage through Countertops: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.

## 2.8 LABORATORY COUNTERTOPS, TABLE TOPS, AND SINKS

- A. Countertops, General: Provide units with smooth surfaces in uniform plane free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch, with continuous drip groove on underside 1/2 inch from edge.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
1. Outlets: Provide with strainers and stoppers, NPS 1-1/2, unless otherwise indicated.
  2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches less than sink depth. Provide in same material as strainer.
- C. Epoxy Countertops Table Tops and Sinks:
1. Countertop Fabrication: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and with butt joints assembled with epoxy adhesive.
    - a. Countertop Configuration: Flat, 1 inch thick, with beveled edge and corners, and with drip groove and applied backsplash.
    - b. Countertop Construction: Uniform throughout full thickness.
    - c. Countertops shall be level between sections. Lippage shall be unacceptable.
  2. Sink Fabrication: Molded in 1 piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.
    - a. Provide with polypropylene strainers and stoppers.
    - b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.
- D. Cup Sinks: Material and size as indicated.
1. Provide epoxy cup sinks with polypropylene strainers and integral tailpieces.
- E. Troughs: Epoxy. Comply with requirements for materials and construction as specified for countertops and sinks. Pitch to drains not less than 1/8 inch/foot.
1. Outlets: Except where troughs empty into sinks, provide NPS 1-1/2 outlets with strainers and tailpieces.
  2. Provide epoxy troughs with polypropylene strainers and tailpieces.

## 2.9 LABORATORY ACCESSORIES

- A. Pegboards: Epoxy, or phenolic-composite pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.

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- B. Flammable Storage Cabinets: 2-door cabinet with 24-gallon capacity, complying with OSHA and NFPA standards.
1. Basis-of-Design: Provide Scientific Materials Company, Inc.; Model SC8080 Jumbo Stacking Flammables Cabinet or an approved equal.
    - a. Acceptable Product: SC 310 with ADA Spacer Apron by CiF Lab Solutions.
- C. Acid Storage Cabinets: 2- door cabinet with 24-gallon capacity and leakproof tray top, complying with OSHA and NFPA standards.
1. Basis-of-Design: Provide Scientific Materials Company, Inc.; Model SC8081 Jumbo Stacking Acid Cabinet or an approved equal.
    - a. Accessories: Provide slide-in isolation compartment for nitric acid.
    - b. Acceptable Product: SC 230 with ADA Spacer Apron by CiF Lab Solutions.
- D. Goggle Storage Cabinet and Goggles: Equal to Campbell Rhea Model # 6784, wall-mounted.
1. Construction: Reinforced steel.
  2. Capacity: 40 pairs of goggles.
  3. Germicidal lamp with automatic five-minute timer.
  4. Lock: Vandal-resistant.
  5. Finish: White, baked enamel.
  6. Goggles: Provide Campbell Rhea Model #6786 Chemical Splash Goggles or equal.
    - a. Amount: 40 goggles.
- E. Fire Blanket and Cabinet: Wall-mounted.
1. Construction: 22 gauge steel cabinet.
  2. Finish: Red; baked-enamel.
  3. Wool Blanket: 62 by 84 inches.

## 2.10 WATER SERVICE FITTINGS

- A. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures - Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.
- B. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- C. Finish: Chromium plated.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
  2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
- E. Hand of Fittings: Furnish right-hand fittings unless fitting designation is followed by "L."

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- F. Remote-Control Valves: Provide needle valves, straight-through or angle type as indicated for fume hoods and where indicated.
- G. Handles: Provide three- or four-arm, forged-brass handles for valves unless otherwise indicated.
1. Provide lever-type handles for ground-key cocks. Lever handle aligns with outlet when valve is closed and is perpendicular to outlet when valve is fully open.
  2. Provide heat-resistant plastic handles for steam valves.
  3. Provide knurled, molded plastic handles for needle valves.
- H. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant. Comply with SEFA 7 for colors and embossed identification.

## 2.11 ELECTRICAL SERVICE FITTINGS

- A. Service Fittings, General: Provide units complete with metal housings, receptacles, terminals, switches, pilot lights, device plates, accessories, and gaskets required for mounting on laboratory casework.
- B. Receptacles: Comply with NEMA WD 1, NEMA WD 6, and UL 498. Duplex type, Configuration 5 20R.
1. Receptacle Grade: Hospital grade unless otherwise indicated.
  2. Color of Receptacles: As selected by Architect unless otherwise indicated or required by NFPA 70.
  3. GFCI Receptacles: Straight blade, feed-through or non-feed-through type. Comply with UL 943, Class A, Hospital grade, and include indicator light that is lighted when device is tripped.
  4. TVSS (Transient Voltage Surge Suppressor) Receptacles: Comply with UL 1449, with integral TVSS in line to ground, line to neutral, and neutral to ground.
    - a. TVSS Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and a minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
    - b. Active TVSS Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
    - c. Receptacle Type: Hospital grade, with isolated-ground terminal.
    - d. Identification: Distinctive marking on face of device to denote TVSS-type unit.
    - e. Color of TVSS Receptacles: Blue.
- C. Data Outlets: Coordinate with Electrical Contractor for installation of data and voice outlets.
- D. Switches: Comply with NEMA WD 1 and UL 20. Provide single-pole, double-pole, or 3-way switches as required; rated 120 to 277-V ac; and in amperage capacities to suit units served.
1. Color of Switches: As selected by Architect unless otherwise indicated or required by NFPA 70.
  2. Provide pilot light adjacent to switch or neon-lighted handle, illuminated when switch is "ON," where noted as "PL" next to switch identification.
  3. Provide key-operated switch where noted as "KEY" next to switch identification.
  4. Provide thermal-overload switches, single or double pole, as required, with maximum overcurrent trip setting to suit particular motor controlled.
- E. Service Fittings, General: Provide units with metal housings and gaskets required for mounting on laboratory casework. Receptacles, terminals, switches, pilot lights, device plates, and accessories are specified in Section 262726 "Wiring Devices."

- F. Recessed-Type Fittings: Provide with galvanized-steel boxes.
- G. Finishes for Service-Fitting Components: Provide housings or boxes for pedestal- and line-type fittings with manufacturer's standard baked-on, chemical-resistant enamel in color as selected by Architect from manufacturer's full range.
- H. Cover Plates: Provide satin finish, Type 304, stainless-steel cover plates with formed, beveled edges.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of laboratory casework.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION OF CABINETS

- A. Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
  - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
  - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
  - 3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
  - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
  - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.
- B. Base Cabinets: Fasten cabinets to partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
  - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than 2 fasteners per side.
- C. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches o.c.
- D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- E. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

### 3.3 INSTALLATION OF COUNTERTOPS

- A. Comply with installation requirements in SEFA 2.3. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.

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- B. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Prepare edges in shop for field-made joints.
  - C. Fastening:
    - 1. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
    - 2. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
  - D. Provide required holes and cutouts for service fittings.
  - E. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.
  - F. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
  - G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

#### 3.4 INSTALLATION OF SINKS

- A. Comply with installation requirements in SEFA 2.3.
- B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in a continuous bead of epoxy resin adhesive, as recommended by sink and countertop manufacturers, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess adhesive while still wet and finish joint for neat appearance.

#### 3.5 INSTALLATION OF LABORATORY ACCESSORIES

- A. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.
- B. Securely fasten adjustable shelving supports, shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.
- C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.
- D. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.

#### 3.6 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in Divisions 22 and 26 Sections for installing water service fittings and electrical devices.

- B. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

### 3.7 CLEANING AND PROTECTING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 123553

## SECTION 311000 - SITE CLEARING AND EROSION CONTROL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Protecting existing vegetation to remain.
  - 2. Removing existing vegetation.
  - 3. Clearing and grubbing.
  - 4. Stripping and stockpiling topsoil.
  - 5. Removing above- and below-grade site improvements.
  - 6. Disconnecting, capping or sealing, and removing site utilities.
  - 7. Temporary erosion and sedimentation control measures.

#### 1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

#### 1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil to be stockpiled on site or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

#### 1.5 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Record drawings, according to Division 01 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing. Do not proceed with operations until existing utilities are located and clearly marked.
- D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.
- E. Suspend clearing operations during wet conditions unless otherwise directed by Architect.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

2.2 EROSION CONTROL MATERIALS

- A. Silt Fence Geotextile: Woven geotextile fabric, manufactured for silt fence applications, made from polyolefins or polyesters; with elongation less than 20 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Grab Tensile Strength: 100 lbf; ASTM D 4632.
  2. Permittivity: 0.05 per second, minimum; ASTM D 4491.
  3. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355.

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- B. Silt Fence Post: Steel, either integrally manufactured with the silt fence as part of a complete system or separately provided. Where separately provided, the following shall apply:
1. Steel posts: T or U cross-sectional shape. Minimum weight 1.3 pounds per foot. Minimum length 5 feet. Shall have projections to aid in fastening wire of fabric. Shall have a metal plate welded near the bottom such that, when driven to proper depth, it will be below ground and will aid stability.
  2. Fasteners: Galvanized wire or other fasteners as required for a secure installation.
  3. Maximum Spacing: 6 feet on center.
- C. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Grab Tensile Strength: 200 lbf; ASTM D 4632.
  2. Sewn Seam Strength: 180 lbf; ASTM D 4632.
  3. Puncture Strength: 80 lbf; ASTM D 4833.
  4. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
  5. Permittivity: 0.1 per second, minimum; ASTM D 4491.
  6. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- D. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Grab Tensile Strength: 90 lbf; ASTM D 4632.
  2. Sewn Seam Strength: 80 lbf; ASTM D 4632.
  3. Puncture Strength: 40 lbf; ASTM D 4833.
  4. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
  5. Permittivity: 0.2 per second, minimum; ASTM D 4491.
  6. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- E. Woven Wire Fabric: ASTM A 116, Class 1, wire and opening sizes as indicated.
- F. Erosion Control Aggregate: Naturally or artificially graded mixture of crushed gravel or stone, in accordance with the gradation requirements indicated on the Drawings and the material requirements of Section 1005 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Material shall be free of shale, clay, friable material, debris, waste, frozen materials, vegetation, organic material, or other deleterious matter.
- G. Riprap: Broken, irregular size and shape, graded stone conforming to Section 1042 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Gradation: Class 1.
  2. Broken concrete shall not be used

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

### 3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to a Stormwater Pollution Prevention Plan (SWPPP), specific to the site, that complies with EPA 832/R-92-005 or the requirements of authorities having jurisdiction, whichever is more stringent.
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. When directed by Architect, remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.3 TREE PROTECTION

- A. Do not excavate within tree protection zones, unless otherwise indicated.
- B. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
  - 1. Cover exposed roots with burlap and water regularly.
  - 2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
  - 3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
  - 4. Backfill with soil as soon as possible.
- C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
  - 1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
  - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

### 3.4 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
  - 1. Arrange with utility companies to shut off indicated utilities.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify Owner, Architect and operating utility not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without the permission of all of the parties noted above.
- C. Excavate for and remove underground utilities indicated to be removed.
- D. Fill depressions caused by utility removal operations with satisfactory soil material unless further excavation or earthwork is indicated and is to be performed immediately. Do not leave depressions overnight.
  - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

### 3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
  - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
  - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
  - 3. Completely remove stumps and roots greater than 1" in diameter, obstructions, and debris extending to a depth of 24 inches below exposed subgrade.
  - 4. Use only hand methods for grubbing within tree protection zone.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated and is to be performed immediately. Do not leave depressions overnight.
  - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

### 3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
  - 1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Limit height of topsoil stockpiles to 10 feet..
  - 2. Do not stockpile topsoil within tree protection zones.
  - 3. Dispose of excess topsoil as specified for surplus soil material in disposal article below.

### 3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
  - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
  - 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

### 3.8 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
  - 1. Do not burn or chip demolished or waste materials on Owner's property.
  - 2. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 311000

## SECTION 312000 - EARTH MOVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Two geotechnical reports have been prepared for the site by ECS Southeast, LLP and dated Nov. 4, 2021 and Jan. 11, 2022 respectively.
  - 1. Copies of the geotechnical reports shall be provided upon request.
  - 2. All Work shall be performed in accordance with the recommendations of the report and any subsequent recommendations by geotechnical engineer.
  - 3. Where material or installation requirements differ from those of this specification, those of the report or subsequent recommendations by the geotechnical engineer shall govern.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses, and exterior plants.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Drainage course for slabs-on-grade.
  - 4. Base course for concrete walks and pavements.
  - 5. Base course for asphalt paving.
  - 6. Base course for grass paving system.
  - 7. Subsurface drainage backfill for walls and trenches.
  - 8. Excavating and backfilling trenches and pits for buried utilities.

#### 1.3 ALLOWANCES

- A. Allowances for earth moving are included in Division 01 Section "Allowances."
- B. Dimensions of excavations shall be established and accepted by Architect prior to initiation of Work. Quantity for payment shall be based on calculation of volume using accepted dimensions. Volumes documented by truck counts are not acceptable.
- C. Volumes shall be based on in-situ measure. Swell factors for expansion of excavated material will not be accepted.
- D. Payment shall not be made without prior acceptance of proposed work by the Architect, or for quantities in excess of the quantity accepted by the Architect.
- E. Allowance No. 1: General Mass Rock Excavation and Disposal Offsite
  - 1. Volume of naturally occurring in-situ rock actually removed, as defined for bulk rock excavation in Article 1.4 below, measured in original position, but not to exceed the following:

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- a. Excavations more than 10 feet in width and more than 30 feet in length.
  - b. 24 inches outside of concrete forms other than at footings.
  - c. 12 inches outside of concrete forms at footings.
  - d. 6 inches outside of minimum required dimensions of concrete cast against grade.
  - e. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
  - f. 6 inches beneath bottom of concrete slabs-on-grade.
2. Excavated rock shall be removed from the site and legally disposed.
- F. Allowance No. 2: Utility Trench Rock Excavation and Disposal Offsite
1. Volume of naturally occurring in-situ rock actually removed, as defined for excavation of footings, trenches, and pits in Article 1.4 below, measured in original position, but not to exceed the following:
    - a. Excavations less than 10 feet in width, regardless of length.
    - b. 24 inches outside of concrete forms other than at footings.
    - c. 12 inches outside of concrete forms at footings.
    - d. 6 inches outside of minimum required dimensions of concrete cast against grade.
    - e. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - f. 6 inches beneath bottom of concrete slabs-on-grade.
    - g. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.
  2. Excavated rock shall be removed from the site and legally disposed.
- G. Allowance No. 3: Structural Fill/Backfill (Imported) In-Place On-Site.
1. Volume of Satisfactory Soil (imported from offsite) as defined in Article 2.1 below.
  2. Where utilized to replace excavated unsuitable material, replace as quickly as practical after excavation, but not before review and acceptance of excavation by Architect.
  3. Volume for payment shall be the measured in place after completion of required compaction.
- H. Allowance No. 4: Unsuitable Soil Removal and Disposal Offsite
1. Volume of naturally occurring in-situ unsatisfactory soil removed, measured in original position.
  2. Excavated unsatisfactory soil shall be removed from the site and legally disposed.
- I. Allowance No. 6: No. 57 Washed Crushed Stone for Foundation Bridging of Alluvial Soils
1. Volume of naturally or artificially graded crushed stone in accordance with the gradation requirements for Coarse Aggregate #57 as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  2. Volume for payment shall be the measured in place after completion of required consolidation.

#### 1.4 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

- 
- B. Base Course: Course placed between the subgrade and paving materials[ (or a choker course, where applicable)].
  - C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
  - D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
  - E. Drainage Course: Course supporting a slab-on-grade that also minimizes upward capillary flow of pore water.
  - F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
    - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
    - 2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
    - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
  - G. Fill: Soil materials used to raise existing grades.
  - H. Filter aggregate: Aggregate backfill material that acts as a filter medium in subdrainage systems.
  - I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
    - 1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.
    - 2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp flywheel power and developing a minimum of 48,510-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.
  - J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
  - K. Subgrade: Soil surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base course, subbase, drainage fill, or topsoil materials, as applicable.
  - L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

## 1.5 SUBMITTALS

- A. Product Data: For the following:

1. Geotextile.
- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
    - a. For locations within areas of DOT jurisdiction, perform testing in accordance with applicable DOT standards and procedures.
  2. Laboratory compaction curves according to [ASTM D 698] [ASTM D 1557] for each on-site and borrow soil material proposed for fill and backfill.
    - a. For locations within areas of DOT jurisdiction, provide laboratory compaction curves in accordance with applicable DOT standards and procedures.
- 1.6 QUALITY ASSURANCE
- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.
    - a. For locations within areas of DOT jurisdiction, perform all work, testing, and inspections in accordance with applicable DOT standards and procedures.
- B. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- 1.7 PROJECT CONDITIONS
- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify Architect not less than two days in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Architect's written permission.
  3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- C. Where Sandy Gravel Base Course (SGBC) is indicated, plan construction to mitigate potential contamination with sediment from adjoining grounds and vehicular traffic.
1. Where practicable, delay installation until as late as possible in the construction sequence to avoid potential for contamination.
  2. Implement and maintain protection measures, as indicated in the "Protection" article below, immediately after installation is complete.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
  - 1. For locations within areas of DOT jurisdiction, Satisfactory Soils shall be as defined by Standard Specifications for that DOT for the applicable work classification.
- C. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT, AASHTO M 145 Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 , or a combination of these groups.
  - 1. Unsatisfactory soils also include satisfactory soils not brought to within 2 percent of optimum moisture content at time of compaction. These soils are not eligible for compensation under any Unit Price provisions for removal of unsatisfactory soil.
- D. "Skinned" Clay for Ball Field Infields: Premixed and processed soil mixture, free of rock or gravel in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
  - 1. The mix shall consist of the following percentages:
    - a. 60% sand (Fine Aggregate 2S per Section 1005 of NCDOT Standard Specs)
    - b. 30% clay
    - c. 10% silt
  - 2. A ¼" depth of vitrified clay soil conditioner such as TurFace, Terra-Green, Pave' Rouge, or Diamond Pro will be applied and uniformly incorporated into surface after placement and fine grading is complete.
  - 3. Mixture shall be red in color.
- E. Clay Mix for Pitchers Mound and Home Plate Area: Premixed and processed soil mixture, free of rock or gravel in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
  - 1. The mix shall consist of the following percentages:
    - a. 50% sand (Fine Aggregate 2S per Section 1005 of NCDOT Standard Specs)
    - b. 40% clay
    - c. 10% silt
  - 2. Mixture shall be red in color.

### 2.2 AGGREGATE MATERIALS

- A. All sand and aggregate materials shall be free of shale, clay, friable material, debris, waste, frozen materials, vegetation, organic material, or other deleterious matter.

- B. Aggregate materials shall not be composed of marine limestone or slag unless specifically allowed in the individual paragraph(s) below.
- C. Graded Aggregate Base Course (GABC): Naturally or artificially graded crushed stone in accordance with the gradation requirements for Coarse Aggregate ABC as defined in Sections 1005, 1006 and 1010 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- D. Sandy Gravel Base Course (SGBC): Naturally or artificially graded mixture of sand and crushed gravel or stone, in accordance with the following gradation requirements:

Sieve	% Passing
1"	100
3/4"	90-100
3/8"	70-80
#4	55-70
#10	45-55
#40	25-35
#200	3-8

- E. Bedding Course: Naturally or artificially graded crushed stone in accordance with the gradation requirements for Coarse Aggregate #57 as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. For locations within areas of NCDOT jurisdiction, bedding for drainage pipe culverts shall be Class II-Type 1 or Class III-Type 1 select materials in accordance with Section 1016-3 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- F. Drainage Course: Naturally or artificially graded crushed stone in accordance with the gradation requirements for Coarse Aggregate #57 as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- G. Filter Aggregate: Naturally or artificially graded crushed stone in accordance with the gradation requirements for Coarse Aggregate #57 as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- H. Sand: Natural or manufactured sand in accordance with the gradation requirements for Fine Aggregate 2S or 2MS as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## 2.3 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
  - 1. Type 1 as defined in Table 1056-1, Section 1056 of NCDOT Standard Specs.
  - 2. Grab Tensile Strength: 90 lbf; ASTM D 4632.
  - 3. Puncture Strength: 60 lbf; ASTM D 4833.
  - 4. Trapezoidal Tear: 40 lbf; ASTM D-4533
  - 5. Apparent Opening Size: No. 70 sieve, maximum; ASTM D 4751.
  - 6. Permittivity: 2.2 second-1, minimum; ASTM D 4491.

7. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355.
  8. Water Flow Rate: 150 gal/min/ft<sup>2</sup>; ASTM D-4491
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 15 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Type 4 as defined in Table 1056-1, Section 1056 of NCDOT Standard Specs.
  2. Grab Tensile Strength: 200 lbf; ASTM D 4632.
  3. Mullen Burst: 400 psi; ASTM D-3786
  4. Puncture Strength: 90 lbf; ASTM D 4833.
  5. Trapezoidal Tear: 75 lbf; ASTM D-4533
  6. Apparent Opening Size: No. 50 sieve, maximum; ASTM D 4751.
  7. Permittivity: 0.05 second<sup>-1</sup>, minimum; ASTM D 4491.
  8. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355.
  9. Water Flow Rate: 5 gal/min/ft<sup>2</sup>; ASTM D-4491

## 2.4 PIPE DETECTION MATERIALS

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Red: Electric.
  2. Yellow: Gas, oil, steam, and dangerous materials.
  3. Orange: Telephone and other communications.
  4. Blue: Water systems.
  5. Green: Sewer systems.
- B. Locator Wire In addition to warning tape where required by operating utility.
1. Material, Gauge and Insulation: as required by operating utility.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section titled "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Section titled "Site Clearing," during earthwork operations.

### 3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
  - 2. Where required, install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

### 3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

### 3.4 EXCAVATION, GENERAL

- A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect, based on the recommendations of the Geotechnical Testing Agency. The Contract Sum will be adjusted for rock excavation according to Allowances included in the Contract Documents. Changes in the Contract time may be authorized for rock excavation.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials or rock, replace with satisfactory soil materials. The Contract Sum will be adjusted for replacement of unsatisfactory soils according to Allowances included in the Contract Documents.
  - 2. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
    - a. Intermittent drilling, ram hammering, or ripping of material not classified as rock excavation is earth excavation.
  - 3. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
    - a. 24 inches outside of concrete forms other than at footings.
    - b. 12 inches outside of concrete forms at footings.
    - c. 6 inches outside of minimum required dimensions of concrete cast against grade.
    - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - e. 6 inches beneath bottom of concrete slabs on grade.
    - f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

### 3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
  - 2. Pile Foundations (if applicable): Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
  - 3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

### 3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. Beyond building perimeter and where specific gradients, lines, depths, and elevations are not indicated, excavate trenches to allow installation of top of pipe below frost line or a minimum depth of 36" below finished grade, whichever is greater.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
  - 1. Clearance: 12 inches each side of pipe or conduit or as indicated.
- C. Trench bottoms where bedding course is indicated: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course, unless otherwise indicated.
  - 1. See "Utility Trench Backfill" paragraph below for bedding course requirements.
- D. Trench bottoms where no bedding course is indicated: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
  - 1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
  - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
  - 3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

### 3.8 SUBGRADE INSPECTION

- A. Notify Architect when excavations have reached required subgrade.
- B. If Architect, based on the recommendations of the Geotechnical Testing Agency, determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material.
  - 1. Authorized additional excavation and replacement material will be paid for according to Allowances included in the Contract Documents.
- C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Unless otherwise directed by Architect, based on the recommendations of the Geotechnical Testing Agency (typically, in order to avoid over-compaction of porous pavement subgrades) perform proof-rolls as follows:
  - 1. Completely proof-roll subgrade in one direction and, where dimensions permit, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
  - 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
  - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, based on the recommendations of the Geotechnical Testing Agency, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, based on the recommendations of the Geotechnical Testing Agency, without additional compensation.

### 3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations, wall footings, utility pipe, or other construction as directed by Architect, based on the recommendations of the Geotechnical Testing Agency.

### 3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.11 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following, as applicable:
  - 1. Making arrangements for required testing and evaluation of subdrainage requirements by Geotechnical Testing Agency.
  - 2. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  - 3. Surveying locations of underground utilities for Record Documents.

4. Testing and inspecting underground utilities.
  5. Removing concrete formwork.
  6. Removing trash and debris.
  7. Removing temporary shoring and bracing, and sheeting.
  8. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.
- C. Comply with the requirements indicated in the paragraph below titled "Compaction of Soil Backfills and Fills".

### 3.12 UTILITY TRENCH BACKFILL

- A. For locations within areas of NCDOT jurisdiction, bedding and backfill for drainage pipe culverts shall be in accordance with Sections 235 and 300 and of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Bedding Course: Where indicated or required by agency having jurisdiction, place and compact bedding course on trench bottoms. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
1. Unless otherwise indicated or required by agency having jurisdiction, bedding course shall be required for the following pipe materials:
    - a. Corrugated High Density Polyethylene Pipe (AASHTO M 252M)
    - b. Corrugated Steel Pipe (ASTM A 760)
    - c. Gravity Flow Polyvinyl Chloride Pipe (ASTM D 3034)
    - d. Gravity Flow Ductile Iron Pipe (ASTM A 746)
    - e. Elliptical Concrete Pipe (ASTM C 507)
    - f. Concrete Box Culvert (ASTM C 1433)
- C. Backfill trenches excavated under footings and within 18 inches of bottom of footings as directed by Architect, based on the recommendations of the Geotechnical Testing Agency.
- D. Initial Backfill—Bedding Material: Where indicated or required by agency having jurisdiction, place and compact initial backfill of bedding course to a height of 2 inches over the utility pipe or conduit.
1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Initial Backfill—Satisfactory Soil: Where no other initial backfill is indicated, place and compact initial backfill of satisfactory soil to a height of 6 inches over the utility pipe or conduit.
1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit.
  2. Coordinate backfilling with utilities testing.
- F. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- G. Place and compact final backfill of satisfactory soil, in accordance with requirements for Backfill as indicated above, to final subgrade elevation.

- H. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- I. Place backfill on subgrades free of mud, frost, snow, or ice.
- J. Comply with the requirements indicated in the paragraph below titled "Compaction of Soil Backfills and Fills".

### 3.13 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Make arrangements for required testing by Geotechnical Testing Agency as required. Do not place subsequent layers until required testing is complete and acceptable results have been obtained and documented.
  - 2. Under grass and planted areas, use satisfactory soil material.
  - 3. Under walks and pavements, use satisfactory soil material.
  - 4. Under steps and ramps, use satisfactory soil material.
  - 5. Under building slabs, use satisfactory soil material.
  - 6. Under footings and foundations, use satisfactory soil material.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.
- D. Do not place soil fill on yielding or unapproved subgrade.

### 3.14 "SKINNED" CLAY FOR BALL FIELD INFIELD, PITCHER'S MOUND, AND HOME PLATE AREA

- A. Lightly scarify prepared subgrade so clay soil mixture will bond to subgrade surface.
- B. Place and compact clay soil mixture to required slope and elevations.
  - 1. Minimum depth of soil clay mixture shall be 6 inches.
- C. Finish grade shall be within a plus or minus ½ inch tolerance:

### 3.15 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry density.

### 3.16 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. For locations within areas of NCDOT jurisdiction, soil backfills and fills shall be in accordance with Section 235 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
  - 1. Make arrangements for required testing by Geotechnical Testing Agency as required. Do not place subsequent layers until required testing is complete and acceptable results have been obtained and documented.
- C. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- D. Compact soil materials to not less than the following percentages of maximum dry density according to ASTM D 698:
  - 1. Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill soil material at 100 percent.
  - 2. Under walkways, compact each layer of backfill or fill soil material at 95 percent.
  - 3. Under lawn or unpaved areas, compact each layer of backfill or fill soil material at 90 percent.
  - 4. For utility trenches under lawns or unpaved areas, compact each layer of initial and final backfill soil material at 90 percent. For all other areas compact to the level required for that area.
  - 5. For porous pavements, compact each layer of backfill or fill soil material to the level specified by the Architect, based on the recommendations of the Geotechnical Testing Agency. Generally, this level will be that required to provide a level of permeability and stability that is equivalent to the original, undisturbed subgrade soil.

### 3.17 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 0.1'.
  - 2. Walks and Pavements (outside of ADA areas): Plus or minus 0.1'.
  - 3. ADA Walks and Pavements/Paths: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.18 SUBSURFACE DRAINAGE

- A. Subsurface Drainage (if applicable): Specified in Section titled "Subdrainage."
- B. Make arrangements for evaluation of subsurface drainage requirements by Geotechnical Testing Agency as required.
- C. If Architect, based on the recommendations of the Geotechnical Testing Agency, determines that subsurface drainage requirements differ from those indicated in the Contract Documents, install revised subsurface drainage as directed.
- D. Authorized adjustments of Subsurface Drainage will be paid for according to Contract provisions for unit prices. If Contract does not provide unit prices for Subsurface Drainage, adjustment will be based on mutually acceptable pricing established prior to the initiation of the Work.

3.19 GRADED AGGREGATE BASE COURSE (GABC)

- A. For locations within areas of NCDOT jurisdiction, base course installation, compaction and testing shall be in accordance with Section 520 and other applicable Sections of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Place GABC on subgrades free of mud, frost, snow, or ice.
- C. Immediately prior to placing GABC, proof-roll subgrade as directed in the "Subgrade Inspection" paragraph above. Do not proceed with placement of GABC until subgrade is approved.
- D. On prepared and approved subgrade, place GABC under pavements as follows:
  - 1. Make arrangements for required testing by Geotechnical Testing Agency.
  - 2. Where indicated, install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  - 3. Place GABC material over subgrade under pavements as indicated.
  - 4. Shape GABC to required crown elevations and cross-slope grades.
  - 5. Place GABC 8 inches or less in compacted thickness in a single layer.
  - 6. Place GABC that exceeds 8 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 8 inches thick or less than 4 inches thick.
    - a. Do not place subsequent layers until required testing is complete and acceptable results have been obtained and documented.
  - 7. Compact GABC at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 100 percent of maximum dry density according to ASTM D 1557.
- E. Shoulders: Where installation is not bordered by concrete curb, walks or alternate confinement system, place shoulders along edges of GABC to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each base layer to not less than 95 percent of maximum dry density according to ASTM D 698.

3.20 SANDY GRAVEL BASE COURSE (SGBC)

- A. Place SGBC on subgrades free of mud, frost, snow, or ice.

- B. Immediately prior to placing SGBC, proof-roll subgrade as directed in the “Subgrade Inspection” paragraph above. Do not proceed with placement of SGBC until subgrade is approved.
- C. On prepared and approved subgrade, place SGBC under pavements as follows:
  - 1. Make arrangements for required testing by Geotechnical Testing Agency.
  - 2. Where indicated, install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  - 3. Place SGBC material over subgrade under pavements as indicated.
  - 4. Shape SGBC to required crown elevations and cross-slope grades.
  - 5. Place SGBC 8 inches or less in compacted thickness in a single layer.
  - 6. Place SGBC that exceeds 8 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 8 inches thick or less than 4 inches thick.
    - a. Do not place subsequent layers until required testing is complete and acceptable results have been obtained and documented.
  - 7. Compact SGBC at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density according to ASTM D 1557.
- D. Shoulders: Where installation is not bordered by concrete curb, walks or alternate confinement system, place shoulders along edges of SGBC to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each base layer to not less than 95 percent of maximum dry density according to ASTM D 698.

### 3.21 DRAINAGE COURSE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. Immediately prior to placing drainage course, proof-roll subgrade as directed in the “Subgrade Inspection” paragraph above. Do not proceed with placement of GABC until subgrade is approved.
- C. On prepared and approved subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
  - 1. Make arrangements for observation of consolidation efforts by Geotechnical Testing Agency.
  - 2. Where indicated, install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
  - 3. Place drainage course 6 inches or less in consolidated thickness in a single layer.
  - 4. Place drainage course that exceeds 6 inches in consolidated thickness in layers of equal thickness, with no consolidated layer more than 6 inches thick or less than 3 inches thick.
  - 5. Consolidate each layer of drainage course with vibratory roller or plate compactor until aggregate appears to be completely consolidated and no additional settlement or consolidation is apparent during a final pass.
  - 6. Protect drainage course from displacement by traffic until subsequent layer or pavement course is installed. Where drainage course is displaced, re-consolidate before placement of subsequent layers or slab-on-grade.
- D. Shoulders: Where installation is not bordered by concrete foundation walls or alternate confinement system, place shoulders along edges of drainage course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and

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compact simultaneously with each drainage course layer to not less than 95 percent of maximum dry density according to ASTM D 698.

### 3.22 FIELD QUALITY CONTROL

- A. Geotechnical Testing Agency: Contractual responsibilities for testing are identified in Division 1 Section "Quality Requirements". Responsible party will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports in accordance with requirements of International Building Code Chapter 1704.7.
  - 1. Soils: Verify site preparation complies with approved soils report.
  - 2. Placement and Compaction: Verify placement and compaction of fill materials comply with approved soils report.
  - 3. Dry-Density: Verify dry-density of compacted fill complies with approved soils report.
- C. Allow Geotechnical Testing Agency to inspect and test subgrades, each fill or backfill layer, and each base course layer as applicable. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect, based on the recommendations of the Geotechnical Testing Agency.
- E. Geotechnical Testing Agency will test compaction of soils and base course in place according to ASTM D 1556 or ASTM D 2922 as applicable, except for locations within areas of NCDOT jurisdiction which shall be tested according to applicable NCDOT procedures and rates.
  - 1. Unless otherwise indicated or required by NCDOT or other authorities having jurisdiction, tests will be performed at the following locations and frequencies:
    - a. Paved and Building Slab Areas: At subgrade, each compacted fill and backfill layer, and each base course layer, at least 1 test for every 5000 sq. ft or less of paved area or building slab, but in no case fewer than 3 tests.
    - b. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test for each 100 feet or less of wall length, but no fewer than 2 tests.
    - c. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 300 feet or less of trench length, but no fewer than 2 tests.
- F. When Geotechnical Testing Agency reports that subgrades, fills, backfills, or base course have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace to depth required; recompact and retest until specified compaction is obtained.

### 3.23 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
- A. Protect SGBC installations from deposition of sediments from adjoining grounds and vehicular traffic.
  - 1. Install and maintain erosion control measures as necessary, at boundaries of installations, to prevent migration of sediment onto the base course surface.
  - 2. Erect and maintain barricades to prevent construction traffic on the base course surface.
  - 3. Do not allow tracking of mud or debris onto the pavement surface by any vehicle.
  - 4. If deposition of sediment on the base course surface is noted, immediately contact Architect and request instructions for cleaning and repair. Do not delay cleaning efforts as subsequent rainfall events will wash sediments into lower levels of the base course and worsen potential damage.
  - 5. Do not use SGBC installations as construction access roads without prior approval of Architect. If approval is received, implement, monitor, and maintain any specified protection measures.

### 3.24 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Unless directed to stockpile onsite, remove surplus satisfactory and unsatisfactory soil and legally dispose of it off Owner's property. Remove waste material, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 312000

## SECTION 321216 - ASPHALT PAVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Hot-mix asphalt paving.
  - 2. Pavement-marking.
  - 3. Wheel stops.

#### 1.3 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

#### 1.4 SUBMITTALS

- A. Material Test Reports: For each paving material.
- B. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  - 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the North Carolina Department of Transportation for asphalt paving work.
  - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
  - 1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

- a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
- b. Review condition of subgrade and preparatory work.
- c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
- d. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

## 1.7 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
  1. Where Work activities encroach into public rights-of-way, provide traffic control to maintain safe transit of work area by vehicular and pedestrian traffic.
    - a. All traffic control shall be in accordance with the requirements of the authorities having jurisdiction.
- B. Environmental Limitations: Do not apply asphalt materials if subgrade is frozen, wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the conditions defined in Section 610-4 of the North Carolina Department of Transportation Standard Specification for Roads and Structures are not met.
- C. Pavement-Marking: Proceed with pavement marking only on clean, dry surfaces and in accordance with the temperature and seasonal limitations defined in Section 1205 of the North Carolina Department of Transportation Standard Specification for Roads and Structures. Do not apply pavement markings if rain is imminent or expected before time required for adequate drying.

## PART 2 - PRODUCTS

### 2.1 ASPHALT PAVING MIXES

- A. Prime Coat: Asphalt binder or emulsified asphalt in accordance with Sections 600. 1020-5 and other applicable Sections of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Tack Coat: Asphalt binder or emulsified asphalt in accordance with Sections 605, 1020-2, 1020-3 and other applicable Sections of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

- C. Intermediate (Binder) Course: Asphaltic Concrete Intermediate Course Type I19.0C in accordance with Sections 610 and other applicable Sections of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- D. Asphalt Surface Course: Asphaltic Concrete Surface Course Type S9.5B in accordance with Sections 610 and other applicable Sections of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## 2.2 AUXILIARY MATERIALS

## 2.3 PAVEMENT MARKINGS

- A. Pavement-Marking Paint: ReflectORIZED, heavy metals free, fast drying, waterborne paint for pavement markings in accordance with Section 1087 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Color: As indicated.
  - 2. Glass Beads: as indicated in NCDOT Standard Spec Section 1087-4.
- B. Thermoplastic Pavement Markings: ReflectORIZED mixture of thermoplastic binder and spherical glass beads in accordance with Section 1087 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Color: As indicated.
  - 2. Glass Beads: as indicated in NCDOT Standard Spec Section 1087-4.

## 2.4 WHEEL STOPS

- A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 5 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
  - 1. Dowels: Galvanized steel, diameter 1/8" smaller than anchor holes provided in wheel stop, 24-inch minimum length.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that the base course has been installed in accordance with the requirements of Division 31 Section "Earth Moving", and that its dry and in suitable condition to begin paving.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

### 3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared base course is ready to receive paving.

- B. Prime Coat: Apply uniformly over surface of compacted graded-aggregate base course at the rates indicated below. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
  - 1. Perform work in conformance with applicable subsections of Section 600 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Apply to base course at a rate of 0.25 to 0.30 gal./sq. yd.
  - 3. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
  - 4. Protect primed substrate from damage until ready to receive paving.
  
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at rate indicated for substrate in Section 605-7 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Perform work in conformance with applicable subsections of Section 605 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 3. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

### 3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  - 1. Perform work in conformance with applicable subsections of Sections 609, 610 and 620 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Place hot-mix asphalt intermediate (binder) course to the total thicknesses indicated in lifts not to exceed 4 inches in thickness.
  - 3. Place hot-mix asphalt surface course to the total thicknesses indicated in lifts not to exceed 3 inches in thickness.
  - 4. Spread mix at temperature of not less than 250 deg F nor more than 325 deg F.
  - 5. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
  - 6. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
  
- B. Place paving in a minimum number of equal width consecutive strips, up to a maximum width of 12 feet for each strip.
  - 1. Adjust width and number of strips as necessary to provide the minimum number while maintaining requirement for longitudinal joint spacing of successive courses as indicated below. Make adjustments in lower courses such that the top course will be applied using the minimum possible number of strips.
  - 2. The width of each strip of the top course shall equal the width of the travel lane unless otherwise indicated.
  - 3. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of each asphalt course before beginning a succeeding course.

- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Perform work in conformance with Sections 610-11 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Clean contact surfaces and apply tack coat to joints.
  - 3. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
  - 4. Offset transverse joints, in successive courses, a minimum of 24 inches.
  - 5. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using "papered" method according to NCDOT Standard Specifications.
  - 6. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  - 7. Compact asphalt at joints to a density within 2 percent of specified course density.

### 3.5 COMPACTION

- A. General: Begin compaction, starting at outside edges and joints, as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Perform work in conformance with Sections 610-10 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Complete compaction before mix temperature cools to 185 deg F.
  - 3. Roll with an 8 to 12 ton tandem steel-wheel roller conforming to the requirements of Section 610-10 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  - 1. Minimum Required Density: as indicated for the pavement mix type in Table 610-7 of the NCDOT Standard Specifications.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.6 INSTALLATION TOLERANCES

- A. For locations within areas of DOT jurisdiction, comply with finish and thickness tolerances as defined in Section 610 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. For all other locations, comply with the following:
- B. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  - 1. Intermediate (Binder) Course: Plus or minus 1/4 inch.
  - 2. Surface Course: Plus 1/4 inch, no minus.
- C. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Intermediate (Binder) Course: 1/4 inch.
  - 2. Surface Course: 1/8 inch.
  - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

### 3.7 PAVEMENT MARKING

- A. Do not apply pavement-markings until layout, colors, and placement have been verified with Architect.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Surface shall be dry and free of glaze, oil, dirt, grease or other foreign contaminants.
- E. Apply paint with mechanical equipment for the application of asphalt paint in accordance with applicable subsections of Section 1205 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
  - 2. Broadcast glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.
- F. Apply thermoplastic pavement markings with mechanical equipment for the application of thermoplastic pavement markings in accordance with applicable subsections of Section 1205 of

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the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

1. Apply at manufacturer's recommended rates to provide a finished thickness of 90 mils.
2. Glass beads shall be mechanically applied to the surface of the thermoplastic material immediately after it is applied to the pavement surface and while it is still molten. Uniformly apply at a rate of 12 lb per 100 sq ft.

G. Apply to produce pavement markings of the dimensions indicated; which are straight or of uniform curvature; of consistent width; and with crisp, uniform, edges.

1. The finished line markings shall be free from waviness and the lateral deviations shall not exceed 2 inches in 15 feet.
2. No markings shall be less than the specified width.

### 3.8 WHEEL STOPS

A. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

### 3.9 FIELD QUALITY CONTROL

A. Testing Agency: Contractual responsibilities for testing are identified in Division 1 Section "Quality Requirements". Responsible party will engage a qualified independent testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined by core samples in accordance with applicable subsections of Sections 609 and 610 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

1. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 samples taken, except for locations within areas of DOT jurisdiction which shall be sampled according to applicable DOT rates.
2. Replace and compact hot-mix asphalt where core tests were taken.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement in accordance with applicable subsections of Sections 609 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to applicable subsections of Section 609 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures., and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by nuclear gauge in accordance with NCDOT Specification Section 609, as applicable.

- a. One test will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 tests taken, except for locations within areas of DOT jurisdiction which shall be tested according to applicable DOT rates.
- E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

### 3.10 PROTECTION

- A. Protect paving installations from deposition of sediments from adjoining grounds and vehicular traffic.
  - 1. Install and maintain erosion control measures as necessary, at boundaries of paving installations, to prevent migration of sediment onto the pavement surface.
  - 2. Where practicable, erect and maintain barricades to prevent construction traffic on the paving surface.
  - 3. Do not allow tracking of mud or debris onto the pavement surface by any vehicle.
  - 4. If deposition of sediment on the paving surface is noted, remove and clean pavement surface immediately. Do not delay cleaning efforts as subsequent rainfall events may worsen potential damage.

END OF SECTION 321216

## SECTION 321313 - CONCRETE PAVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
  - 1. Driveways and roadways.
  - 2. Curbs and gutters.
  - 3. Pavement markings.

#### 1.3 SUBMITTALS

- A. Field quality-control test reports.
- B. Minutes of preinstallation conference.

#### 1.4 QUALITY ASSURANCE

- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  - 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.
    - a. For locations within areas of DOT jurisdiction, perform all work, testing, and inspections in accordance with applicable DOT standards and procedures.
- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with the equipment, material and production requirements of Sections 700 and 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- C. Concrete Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 and ASTM C 1077 to perform material evaluation tests and to design concrete mixtures.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

## 1.5 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
  - 1. Where Work activities encroach into public rights-of-way, provide traffic control to maintain safe transit of work area by vehicular and pedestrian traffic.
    - a. All traffic control shall be in accordance with the requirements of the authorities having jurisdiction.
- B. Environmental Limitations: Do not install concrete paving if subgrade is frozen, wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the ambient air temperature is below, or is expected to fall below, 40 deg F during the time of placement.
- C. Pavement-Marking: Proceed with pavement marking only on clean, dry surfaces; at a minimum ambient or surface temperature of at least 55 deg F, and not exceeding 95 deg F; and at a maximum relative of 85%. Do not apply pavement markings if rain is imminent or expected before time required for adequate drying.

## PART 2 - PRODUCTS

### 2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
  - 1. Use flexible or curved forms for curves as necessary in order to prevent a chord effect in the alignment of the finished work.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

### 2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: AASHTO M 55, fabricated from as-drawn steel wire into flat sheets.
- B. Reinforcing Bars: ASTM A 615, Grade 60; deformed.
- C. Plain Steel Wire: AASHTO M 32, as drawn.
- D. Joint Dowel Bars: Plain steel bars, AASHTO M 31, Grade 60. Cut bars true to length with ends square and free of burrs.
- E. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- F. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

- G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
  - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
  - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
- H. Epoxy Repair Coating: Liquid two-part epoxy repair coating, compatible with epoxy coating on reinforcement.
- I. Zinc Repair Material: ASTM A 780.

## 2.3 CONCRETE MATERIALS

- A. Concrete: Pavement Class Portland Cement Concrete in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Design the mix to produce an average strength sufficient to indicate that a minimum strength of 650 psi in flexure and 3,500 psi in compression will be achieved in the field within 28 days.
- B. Water: ASTM C 94/C 94M.
- C. Admixtures: Air-entraining, accelerating, retarding, and water reducing admixtures shall be in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## 2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 4, burlap cloth made from jute or kenaf, weighing not less than 12 oz. per running yd. dry, based on 40 inch width.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
  - 1. Products:
    - a. Axim Concrete Technologies; Cimfilm.
    - b. Burke by Edeco; BurkeFilm.
    - c. ChemMasters; Spray-Film.
    - d. Conspec Marketing & Manufacturing Co., Inc.; Aquafilm.
    - e. Dayton Superior Corporation; Sure Film.
    - f. Euclid Chemical Company (The); Eucobar.
    - g. Kaufman Products, Inc.; Vapor Aid.
    - h. Lambert Corporation; Lambco Skin.
    - i. L&M Construction Chemicals, Inc.; E-Con.

- j. MBT Protection and Repair, ChemRex Inc.; Confilm.
  - k. Meadows, W. R., Inc.; Sealtight Evapre.
  - l. Metalcrete Industries; Waterhold.
  - m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
  - n. Sika Corporation, Inc.; SikaFilm.
  - o. Symons Corporation; Finishing Aid.
- E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- 1. Products:
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    - b. Burke by Edoko; Aqua Resin Cure.
    - c. ChemMasters; Safe-Cure Clear.
    - d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
    - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
    - f. Euclid Chemical Company (The); Kurez DR VOX.
    - g. Kaufman Products, Inc.; Thinfilm 420.
    - h. Lambert Corporation; Aqua Kure-Clear.
    - i. L&M Construction Chemicals, Inc.; L&M Cure R.
    - j. Meadows, W. R., Inc.; 1100 Clear.
    - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
    - l. Symons Corporation; Resi-Chem Clear.
    - m. Tamms Industries Inc.; Horncure WB 30.
- F. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.
- 1. Products:
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 WP WB.
    - b. Burke by Edoco; Resin Emulsion White.
    - c. ChemMasters; Safe-Cure 2000.
    - d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
    - e. Dayton Superior Corporation; Day-Chem White Pigmented Cure (J-10-W).
    - f. Euclid Chemical Company (The); Kurez VOX White Pigmented.
    - g. Kaufman Products, Inc.; Thinfilm 450.
    - h. Lambert Corporation; Aqua Kure-White.
    - i. L&M Construction Chemicals, Inc.; L&M Cure R-2.
    - j. Meadows, W. R., Inc.; 1200-White.
    - k. Symons Corporation; Resi-Chem White.
    - l. Tamms Industries, Inc.; Horncure 200-W.

## 2.5 RELATED MATERIALS

- A. Preformed Joint Filler: AASHTO M 153, preformed sponge rubber expansion joint filler.
- 1. Use only materials manufactured from rubber.
  - 2. Use materials that require a load of not less than 340 kPa or greater than 5,200kPa to compress to 50% of its thickness when tested in accordance with AASHTO T 42.
  - 3. Use materials that have a recovery of at least 70% when tested in accordance with AASHTO T 42.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

- C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

## 2.6 PAVEMENT MARKINGS

- A. Pavement-Marking Paint: ReflectORIZED, heavy metals free, fast drying, waterborne paint for pavement markings in accordance with Section 1087 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Color: As indicated.
  2. Glass Beads: as indicated in NCDOT Standard Spec Section 1087-4.
- B. Thermoplastic Pavement Markings: ReflectORIZED mixture of thermoplastic binder and spherical glass beads in accordance with Section 1087 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Color: As indicated.
  2. Glass Beads: as indicated in NCDOT Standard Spec Section 1087-4.

## 2.7 WHEEL STOPS

- A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 5 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
1. Dowels: Galvanized steel, diameter 1/8" smaller than anchor holes provided in wheel stop, 24-inch minimum length.

## 2.8 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, for each type and strength of normal-weight concrete determined by either laboratory trial mixes.
1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
1. Compressive Strength (28 Days): 3,500 psi.
  2. Maximum Water-Cementitious Materials Ratio at Point of Placement: in accordance with Section 1000-3 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  3. Slump Limit: Maximum of 3 inches where placed by hand methods and 1.5 inches where placed by a fully mechanized paving train.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 5 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to the requirements of Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures as follows:
  1. Fly Ash: not to exceed 30 percent.
  2. Ground Granulated Blast-Furnace Slag: not to exceed 50 percent.

## 2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix and deliver concrete materials and concrete according to Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. Furnish batch certificates for each batch discharged and used in the Work.
  1. Conform to applicable weather and temperature requirements as indicated in Sections 700 and 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. For concrete curb and gutter and pavements to be subjected to vehicular traffic, proof-roll prepared subbase surface with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
  1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.
  2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
  3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Section titled "Earth Moving."
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

### 3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

### 3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### 3.4 STEEL REINFORCEMENT

- A. General: Comply with Section 425 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures and CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### 3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
  - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
  - 2. For locations within areas of DOT jurisdiction, perform all work, testing, and inspections in accordance with applicable DOT standards and procedures.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
  - 1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
  - 2. Provide tie bars at sides of pavement strips where indicated.
  - 3. Butt Joints: Use bonding agent or epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
  - 1. Unless otherwise indicated, joints shall be 3/4 inch in width.
  - 2. Locate expansion joints at intervals of 100 feet, unless otherwise indicated.

3. Extend joint fillers full width and depth of joint.
  4. Place top of joint filler flush with finished concrete surface.
  5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction (Control) Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/2-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces unless indicated to remain.
  2. Spacing in Pavements: Unless otherwise indicated, locate as follows:
    - a. Locate transverse contraction joints at intervals twice the width of the pavement, not to exceed 10 feet.
    - b. Where the pavement width exceeds 10 feet to a maximum of 24 feet, locate a longitudinal contraction joint along the centerline of the pavement.
    - c. Where the pavement width exceeds 24 feet, locate longitudinal contraction joints at evenly spaced divisions not to exceed 10 feet.
  3. Spacing in Curb: Unless otherwise indicated, locate contraction joints to coincide with the adjoining concrete pavement or, where an adjoining concrete pavement does not exist, at an interval of 10 feet.
- E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/2-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces unless indicated to remain.

### 3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with the requirements of Sections 700 and 710 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures for transporting and placing concrete.
- E. Do not add water to fresh concrete after testing.

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- F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- G. Consolidate concrete according to Sections 700 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- H. Screed pavement surfaces with a straightedge and strike off.
- I. Provide initial finishing of concrete according to Sections 710-6 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning final finishing operations or spreading surface treatments.
  2. Utilize mechanical equipment to extend practicable to minimize hand finishing.
- J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.
- K. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.
1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.
- L. When adjoining pavement lanes are placed in separate pours, do not operate concrete installation equipment on placed concrete until it has attained 85 percent of its 28-day compressive strength.
- M. Cold-Weather Placement: Comply with Sections 700 and 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures and as follows when cold weather conditions exist:
1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  2. Concrete operations shall not be undertaken when air temperature has fallen to or is expected to fall below 40 deg F.
  3. Do not use frozen materials or materials containing ice or snow.
  4. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- N. Hot-Weather Placement: Comply with Sections 700 and 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures and as follows when hot weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

### 3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  1. Medium-to-Fine-Textured Broom Finish: Unless otherwise indicated or required by authority having jurisdiction, draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

### 3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with Section 700 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures for cold, hot and rainy weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
  1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at

- least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.9 PAVEMENT TOLERANCES

- A. For locations within areas of DOT jurisdiction, comply with finish and thickness tolerances as defined in Section 710 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. For all other locations, comply with the following:
  1. Elevation: 1/4 inch.
  2. Thickness: Plus 3/8 inch, minus 1/4 inch.
  3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
  4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
  5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
  6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
  7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
  8. Joint Spacing: 3 inches.
  9. Contraction Joint Depth: Plus 1/4 inch, no minus.
  10. Joint Width: Plus 1/8 inch, no minus.

### 3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Sweep and clean surface to eliminate loose material and dust.
- C. Surface shall be dry and free of glaze, oil, dirt, grease or other foreign contaminants.
- A. Apply paint with mechanical equipment for the application of asphalt paint in accordance with applicable subsections of Section 1205 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  1. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
  2. Broadcast glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.
- B. Apply thermoplastic pavement markings with mechanical equipment for the application of thermoplastic pavement markings in accordance with applicable subsections of Section 1205 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  1. Apply at manufacturer's recommended rates to provide a finished thickness of 90 mils.
  2. Glass beads shall be mechanically applied to the surface of the thermoplastic material immediately after it is applied to the pavement surface and while it is still molten. Uniformly apply at a rate of 12 lb per 100 sq ft.

- C. Apply to produce pavement markings of the dimensions indicated; which are straight or of uniform curvature; of consistent width; and with crisp, uniform, edges.
1. The finished line markings shall be free from waviness and the lateral deviations shall not exceed 2 inches in 15 feet.
  2. No markings shall be less than the specified width.

### 3.11 WHEEL STOPS

- A. Securely attach wheel stops to pavement with not less than two galvanized-steel dowels embedded at one-quarter to one-third points. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

### 3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Contractual responsibilities for testing are identified in Division 1 Section "Quality Requirements". Responsible party will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements, except for locations within areas of DOT jurisdiction, which shall be sampled according to applicable DOT rates and procedures:
1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
  3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
  4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
  5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
  6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
    - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
  7. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
  8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete

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testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
11. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.13 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude vehicular traffic from pavement for at least 7 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

## SECTION 321400 - UNIT PAVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Concrete pavers set in aggregate setting beds.
  - 2. Concrete edge restraints (curbs)

#### 1.3 SUBMITTALS

- A. Product Data: For materials other than water and aggregates.
- B. Samples for Verification:
  - 1. Full-size units of each type of unit paver indicated.
- C. Minutes of preinstallation conference.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified unit paving installer meeting the following qualifications.
  - 1. Experience: three years' experience in unit paving installation in addition to requirements in Division 01 Section "Quality Requirements."
  - 2. Installer's Field Supervision: Installer shall maintain the above certified supervisor on Project site full-time when work is in progress.
- B. Source Limitations: Obtain each type of unit paver, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
- D. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  - 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquids in tightly closed containers protected from freezing.

## 1.6 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade, base course, or setting beds. Remove and replace unit paver work damaged by frost or freezing.
- B. Install products during favorable weather conditions according to manufacturer's written instructions.
- C. Where practicable, delay installation of unit paving until as late as possible in the construction sequence to avoid potential damage by construction traffic.
- D. Implement and maintain protection measures, as indicated in the "Protection" article below, immediately after installation is complete.

## PART 2 - PRODUCTS

### 2.1 CONCRETE PAVERS

- A. Concrete Pavers: Solid interlocking paving units complying with ASTM C 936 and resistant to freezing and thawing when tested according to ASTM C 67, made from normal-weight aggregates.
  - 1. Thickness: As indicated.
  - 2. Face Size and Shape: As indicated.
  - 3. Color: As selected by Architect from manufacturer's full range.

### 2.2 ACCESSORIES

- A. Job-Built Concrete Edge Restraints: Comply with requirements in Division 32 Section "Concrete Paving" for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of 4,500 psi.

### 2.3 AGGREGATE SETTING-BED MATERIALS

- A. All sand and aggregate materials shall be free of shale, clay, friable material, debris, waste, frozen materials, vegetation, organic material, or other deleterious matter.
- B. Graded Aggregate Base Course: Specified in Division 31 Section "Earth Moving".
- C. Sand for Leveling Course: Natural or manufactured sand in accordance with the gradation requirements for Fine Aggregate 2S or 2MS as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- D. Sand for Joints: Natural or manufactured sand in accordance with the gradation requirements for Fine Aggregate 2S or 2MS as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas indicated to receive paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 2. Where pavers are to be installed over waterproofing, examine waterproofing installation, with waterproofing installer present, for protection from paving operations. Where applicable, examine areas where waterproofing system is turned up or flashed against vertical surfaces and horizontal waterproofing. Proceed with installation only after protection is in place.

### 3.2 PREPARATION

- A. Confirm that base course has been prepared and tested according to requirements in Division 31 Section "Earth Moving". Confirm that damage or degradation to base course has not occurred since testing was completed. Proceed with unit paver installation only after deficient base course has been corrected and is ready to receive leveling course for unit pavers.
- B. Confirm that job-built concrete edge restraints comply with requirements in Division 32 Section "Concrete Paving".

### 3.3 INSTALLATION, GENERAL

- A. Do not use unit pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
- B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
- C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

- D. Exercise care in handling coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. Remove coating from bonding surfaces before setting brick.
- E. Joint Pattern: As indicated.
- F. Pavers over Waterproofing (where applicable): Exercise care in placing pavers and setting materials over waterproofing so protection materials are not displaced and waterproofing is not punctured or otherwise damaged. Carefully replace protection materials that become displaced and arrange for repair of damaged waterproofing before covering with paving.
  - 1. Where applicable, provide joint filler at waterproofing that is turned up on vertical surfaces, unless otherwise indicated; where unfilled joints are indicated, provide temporary filler or protection until paver installation is complete.
- G. Tolerances: Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.
- H. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.
  - 1. Install Job-Built Concrete Edge Restraints as indicated on the Drawings and in accordance with the requirements of Division 32 Section "Concrete Paving".
- I. Where applicable, provide steps made of pavers as indicated. Install paver steps before installing adjacent pavers.
  - 1. Where pavers set in mortar bed are indicated for steps constructed adjacent to pavers set in aggregate setting bed, install steps and allow mortar to cure before placing aggregate setting bed and remainder of pavers. Cut off mortar bed at a steep angle so it will not interfere with aggregate setting bed.

#### 3.4 AGGREGATE SETTING-BED APPLICATIONS

- A. Where indicated, place separation geotextile over prepared subgrade, overlapping ends and edges at least 12 inches.
- B. Where indicated, place drainage geotextile over compacted base course, overlapping ends and edges at least 12 inches.
- C. Place leveling course and screed to thickness indicated, taking care that moisture content remains constant and density is loose and constant until pavers are set and compacted.
- D. Treat leveling course with herbicide to inhibit growth of grass and weeds.
- E. Set pavers with a minimum joint width of 1/16 inch and a maximum of 1/8 inch, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.
  - 1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
- F. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

1. After edge pavers are installed and there is a completed surface or before surface is exposed to rain.
  2. Before ending each day's work, fully compact installed concrete pavers to within 36 inches of the laying face. Cover pavers that have not been compacted, and leveling course on which pavers have not been placed, with nonstaining plastic sheets to protect them from rain.
- G. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.
- H. Do not allow traffic on installed pavers until sand has been vibrated into joints.
- I. Repeat joint-filling process 30 days later.

### 3.5 REPAIRING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

### 3.6 PROTECTION

- A. Protect paving installations from deposition of sediments from adjoining grounds and vehicular traffic.
1. Install and maintain erosion control measures as necessary, at boundaries of paving installations, to prevent migration of sediment onto the pavement surface.
  2. Where practicable, erect and maintain barricades to prevent construction traffic on the paving surface.
  3. Do not allow tracking of mud or debris onto the pavement surface by any vehicle.
  4. If deposition of sediment on the paving surface is noted, remove and clean pavement surface immediately. Do not delay cleaning efforts as subsequent rainfall events may worsen potential damage.

END OF SECTION 321400

## SECTION 321530 – AGGREGATE PAVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Plantation mix surface course.

#### 1.3 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  - 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
  - 1. Do not dump or store aggregates near structures, utilities, walkways and pavements, or on existing turf areas or plants.

#### 1.5 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade, base course, or setting beds.
- B. Install products during favorable weather conditions according to manufacturer's written instructions.
- C. Where practicable, delay installation of aggregate paving until as late as possible in the construction sequence to avoid potential for contamination by sediment.
- D. Implement and maintain protection measures, as indicated in the "Protection" article below, immediately after installation is complete.

## PART 2 - PRODUCTS

### 2.1 AGGREGATE MATERIALS

- A. All sand and aggregate materials shall be free of shale, clay, friable material, debris, waste, frozen materials, vegetation, organic material, or other deleterious matter.
- B. Plantation Mix: Evenly blended mixture consisting of equal parts by weight of the following:
  - 1. Naturally or artificially graded mixture of crushed gravel or stone, in accordance with the gradation requirements for Coarse Aggregate #78M as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 2. Natural or manufactured sand in accordance with the gradation requirements for Fine Aggregate 2S or 2MS as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that the subgrade has been installed in accordance with the requirements of Division 31 Section "Earth Moving", and that its dry, at proper grade and cross-section, uncontaminated by soil deposits, and in suitable condition to begin paving.
  - 1. Do not proceed with installation of paving until unsatisfactory conditions have been corrected and subgrade has been approved.

### 3.2 PLANTATION MIX

- A. Place plantation mix on subgrade free of mud, frost, snow, or ice.
- B. On prepared and approved subgrade, place plantation mix as follows:
  - 1. Make arrangements for required testing by Geotechnical Testing Agency.
  - 2. Place plantation mix material over subgrade as finished pavement course as indicated.
  - 3. Shape plantation mix to required crown elevations and cross-slope grades.
  - 4. Place plantation mix 8 inches or less in compacted thickness in a single layer.
  - 5. Place plantation mix that exceeds 8 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 8 inches thick or less than 4 inches thick.
    - a. Do not place subsequent layers until required testing is complete and acceptable results have been obtained and documented.
  - 6. Compact plantation mix at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density according to ASTM D 1557.
- C. Shoulders: Where installation is not bordered by concrete curb, walks or alternate confinement system, place shoulders along edges of plantation mix to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each base layer to not less than 95 percent of maximum dry density according to ASTM D 698.

### 3.3 FIELD QUALITY CONTROL

- A. Geotechnical Testing Agency: Contractual responsibilities for testing are identified in Division 1 Section "Quality Requirements". Responsible party will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow Geotechnical Testing Agency to inspect and test each aggregate fill layer. Proceed with subsequent work only after test results for previously completed work comply with requirements.
- C. Geotechnical Testing Agency will test compaction of aggregate in place according to ASTM D 1556, or ASTM D 2922, as applicable. Tests will be performed at the following locations and frequencies:
  - 1. Paved Areas: At each compacted aggregate fill layer, at least 1 test for every 5000 sq. ft or less of paved area, but in no case fewer than 3 tests.
- D. When Geotechnical Testing Agency reports that aggregate fills have not achieved degree of compaction specified, re-compact and re-test until specified compaction is obtained.

### 3.4 PROTECTION

- A. Protect paving installations from deposition of sediments from adjoining grounds and vehicular traffic.
  - 1. Install and maintain erosion control measures as necessary, at boundaries of paving installations, to prevent migration of sediment onto the pavement surface.
  - 2. Do not allow tracking of mud or debris onto the pavement surface by any vehicle.
  - 3. If deposition of sediment on the paving surface is noted, immediately contact Architect and request instructions for cleaning and repair. Do not delay cleaning efforts as subsequent rainfall events will wash sediments into lower levels of the paving system and worsen potential damage.
- B. Erect and maintain barricades to prevent construction traffic on the paving surface.
  - 1. Provide alternate construction traffic routes to discourage potential use of paving installation by construction traffic.
  - 2. Where alternative construction routes are not available, contact Architect instructions regarding use of pavement for construction access. Implement, monitor, and maintain any specified protection measures.

END OF SECTION 329200

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## SECTION 321801 – TRACK & FIELD LINE MARKINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This section covers all labor and materials required to install the track & field line markings.
- B. The Track Surface Contractor is responsible for the purchase and installation of all paints and line markings.

#### 1.3 CODES AND STANDARDS

- A. Codes and standards follow the current guidelines set forth by the National Federation of State High School Associations (NFSHSA).

#### 1.4 SUBMITTALS

- A. The following information shall be submitted prior to installation of specified work:
  - 1. A list depicting the colors of all line markings and labels of the events to be included for approval prior to installation. Also, all symbols and markings clearly identified, illustrated, and their colors stated. The recommended NFSHSA colors shall be used.
  - 2. Installation process and requirements for line markings and any conditions that may limit the installation or affect quality of installation.
  - 3. Material safety data sheets on all products, as necessary.
- B. The following information shall be submitted at the completion of the specified work:
  - 1. Upon completion of all Line Markings, the Track & Field Surfacing Contractor shall submit the attached Track & Field Measurements Form, completed by a Surveyor, which shall be a registered professional in the State of North Carolina stating the installed track surface and line markings meet the requirements outlined in the NFSHSA Rulebook. The Surveyor, selected by the Track & Field Surfacing Contractor, must survey the facility's as-built line markings.
    - a. NFSHSA Rulebook includes:
      - 1) levels of the track, runway, approach and landing surfaces;
      - 2) start and finish lines;
      - 3) track lanes;
      - 4) baton-passing zones;
      - 5) hurdle placements; and
      - 6) throwing surfaces – the shot.
  - 2. Upon completion of all line markings, the Track & Field Surfacing Contractor shall submit to the Owner a five (5) diagram/drawing depicting and identifying all line markings: 1) a key to the color codes, 2) a chart for all symbols, and 3) labels for all events.

### PART 2 - PRODUCTS

2.1 PAINT

- A. The paint is 100% acrylic latex line paint compatible for use on Track & Field Asphalt Surface.

2.2 TEMPORARY REFERENCE MARKINGS

- A. These markings shall be removed at the completion of the project.

PART 3 - EXECUTION

3.1 SUMMARY

- A. General line markings of the 400 meter track and field events, shall be applied, using only paint, primers and finishes supplied and guaranteed by the approved manufacturer and/or supplier.
- B. All markings shall be in accordance with the rules of the NFSHSA and shall be certified for accuracy. The color code of the NFSHSA shall be followed.
- C. No line markings shall be installed if the adverse weather conditions are present (too windy).
- D. Allow asphalt or concrete paving to cure for 30 days before starting pavement marking.
- E. Sweep, wash, and clean surface to eliminate loose material and dust.
- F. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

3.2 LINE MARKINGS

- A. The following list of colors is to be used for marking the running track:

<b>Starting Lines:</b> .....	<b>Color:</b>
100 meter.....	White
110 HH.....	White
200 meters.....	White
300 meters.....	White
400 meters.....	White
800 meters.....	Green
1600/3200 meters.....	White
800-meter Relay .....	Red
1600-meter Relay .....	Blue
<b>Finish Line</b> .....	<b>White</b>
<b>Break Line</b> .....	<b>Green</b>
<b>Relay Exchange Zones:</b>	
400 meters.....	Yellow
800 meters –Lane 1 only split color-Red/Yellow .....	Red
1-2 and 2-3 Red: 3-4 Yellow (same mark as 400 meters, 2-3)	
1600 meters.....	Blue
3200 meters.....	Green
<b>Hurdle Locations:</b>	
100 meter HH (girls) .....	Yellow
100 meter HH (boys) .....	Blue
300 meter LH/IH (girls/boys).....	Red

One-turn stagger .....	Green
Two-turn stagger .....	White
Three-turn stagger .....	Blue
Four-turn stagger .....	Red

- B. All line markings shall be installed according to the recommended colors as outlined by the National Federation of State High School Associations (NFSHSA). All color markings listed above must be reviewed and verified as correct, as per the rules and regulations of the governing body.
- C. All line markings must be reviewed and verified with the Owner's representative (Architect and Track Coach) prior to installation.

END OF SECTION 321801

## SECTION 321802 – FIELD EVENT MATERIALS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This section covers all labor and materials required to install the special field event materials
  - 1. Sand - for the long and triple jump sand pits.
- B. The Contractor is responsible for the purchase and installation of all materials.

#### 1.3 CODES AND STANDARDS

- A. Codes and standards follow the current guidelines set forth by the National Federation of State High School Associations (NFSHSA).

#### 1.4 SUBMITTALS

- A. Provide one (1) gallon sample of sand for visual inspection, testing and approval prior to installation.

#### 1.5 QUALITY ASSURANCE

- A. The physical make-up of these products vary across the region; therefore the Contractor shall use its best efforts to supply the Owner with a product that best meets the performance specifications listed below.

### PART 2 - PRODUCTS

#### 2.1 SAND

- A. All sand for the long/triple jumps sand pits shall follow the specifications outlined by the United States Golf Association (USGA) guidelines for Bunker Sand. The website for this information is: <http://turf.lib.msu.edu/1990s/1998/980109.pdf> .
- B. The sand shall be washed and sized as follows:

Screen No.	Size in MM	Range % Within
18	1.00	75%
35	0.50	75%
60	0.25	75%
140	0.10	25%

1. Sand shall be free of trash, organic matter, clay, silt and rocks.
  2. Sand shall meet the following technical requirements:
    - a. Water permeability or filtration rate with a minimum of 20 inches/hour
    - b. Bulk density of 1.55 grams per cubic centimeter
    - c. Penetrometer Reading of 1.8 to 2.2 kg/cm<sup>2</sup>
    - d. Sand shape of high sphericity and rounded
- C. Sand varies around the region; therefore, prior to installation the Contractor shall provide the Owner or Owner's representative with a one (1) gallon sample for review and approval.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which work is to be installed. Do not proceed with work until satisfactory conditions are corrected.

#### 3.2 INSTALLATION

- A. Sand - The sand shall be one of the last items installed on the facility to maintain the physical properties.
  1. Do not install the sand until subdrainage pipe is installed and connected to drainage system.

END OF SECTION 32 18 02

## SECTION 323113 - CHAIN LINK FENCES AND GATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:

- 1. Chain-Link Fences.
- 2. Gates: swing.

#### 1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
  - 1. Fence and gate posts, rails, and fittings.
  - 2. Chain-link fabric, reinforcements, and attachments.
  - 3. Gates and hardware.
  - 4. Accessories.
- B. Shop drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.
- C. Samples for Verification: For each type of chain-link fence and gate indicated.
  - 1. Polymer-coated steel wire (for fabric) in 6-inch lengths.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  - 1. At least three years' experience and has completion of at least five chain link fence projects with same material and of similar scope to that indicated for this Project with a successful construction record of in-service performance.
  - 2. Engineering Responsibility: Preparation of data for chain-link fences and gates, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
  - 3. Single-Source Responsibility: Obtain chain link fences and gates, including accessories, fittings, and fastenings, from a single source.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Height indicated on Drawings. Provide fabric in one-piece heights for fencing 12 feet and less in height, measured between top and bottom of outer edge of selvage knuckle or twist. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
  - 1. Steel Wire Fabric: Metallic and Polymer-coated wire with a diameter of 0.148 inch (9 gauge).
    - a. Mesh Size: 2 inches.
    - b. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft.
    - c. Polymer Coating: ASTM F 668, Class 1 over metallic-coated steel wire.
      - 1) Color: Black.
  - 2. Selvage: Knuckled top and bottom.

2.2 FENCE FRAMING

- A. Round member sizes are given in actual outside diameter (OD) to the nearest thousandth of inches. Round fence posts and rails are often referred to in ASTM standard specifications by nominal pipe sizes (NPS) or the equivalent trade sizes in inches. The following indicates these equivalents all measured in inches:

Actual OD	NPS Size	Trade Size
1.315	1	1-3/8
1.660	1-1/4	1-5/8
1.900	1-1/2	2
2.375	2	2-1/2
2.875	2-1/2	3
3.500	3	3-1/2
4.000	3-1/2	4
6.625	6	6-5/8
8.625	8	8-5/8

- B. Type I Round Posts: Standard weight (schedule 40) galvanized-steel pipe conforming to ASTM F 1083, according to heavy industrial requirements of ASTM F 669, Group IA, with minimum yield strength of 25,000 psi, not less than 1.8 oz. of zinc per sq. ft. Type A coating inside and outside according to ASTM F 1234, as determined by ASTM A 90, and weights per foot as follows:

Actual OD	Weight (lb/ft)	NPS Size
1.315	1.68	1
1.660	2.27	1-1/4
1.900	2.72	1-1/2
2.375	3.65	2
2.875	5.79	2-1/2
3.500	7.58	3
4.000	9.11	3-1/2
6.625	8.97	6
8.625	28.55	8

- C. Top Rail: Manufacturer's longest lengths (17 to 21 feet) with wedged-end or expansion-type coupling, approximately 6 inches long for joining. Provide rail ends or other means for attaching top rail securely to each gate corner, pull, and end post.
  - 1. Round Steel: 1.660-inch OD Type I or II steel pipe.
- D. Steel posts for fabric heights over 6 feet:
  - 2. Round Line or Intermediate Posts: 2.375-inch OD Type I or II steel pipe.
  - 3. Round End, Corner, and Pull Posts: 3.5-inch OD Type I or II steel pipe.
- E. Swing Gate Posts: Furnish posts to support single gate leaf, or one leaf of a double-gate installation, according to ASTM F 900, sized as follows for steel and aluminum pipe posts:
  - 4. Steel posts for fabric height over 6 feet and gate leaf width:
    - a. Up to and Including 6 Feet: 2.875-inch OD pipe weighing at least 4.64 lb per ft.
    - b. Over 6 to 12 Feet: 4.000-inch OD pipe weighing at least 8.65 lb per ft.
- F. Coating: hot dipped galvanized.

### 2.3 FITTINGS AND ACCESSORIES

- A. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel to suit manufacturer's standards.
  - 1. Steel and Iron: Unless specified otherwise, hot-dip galvanize pressed steel or cast-iron fence fittings and accessories with at least 1.2 oz. zinc per sq. ft. as determined by ASTM A 90.
  - 2. Aluminum: Die cast conforming to ASTM B 26, aluminum-alloy 360 or sand cast conforming to ASTM B 85, aluminum-alloy 365, ZG61A, or Tenzalloy.
- B. Post and Line Caps: Provide weathertight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail.
- C. Post Brace Assembly: Manufacturer's standard adjustable brace. Use material specified below for brace, and truss to line posts with 3/8-inch-diameter rod and adjustable tightener. Provide manufacturer's standard galvanized-steel, cast-iron or cast-aluminum cap for each end.
  - 1. Round Steel: 1.660-inch OD Type I or II steel pipe.
- D. Bottom and Center Rail: Same material as top rail. Provide manufacturer's standard galvanized-steel, cast-iron or cast-aluminum cap for each end.

- E. Tension or Stretcher Bars: Hot-dip galvanized steel with a minimum length 2 inches less than the full height of fabric, a minimum cross section of 3/16 inch by 3/4 inch, and a minimum of 1.2 oz. of zinc coating per sq. ft. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into the post.
- F. Tension and Brace Bands: 3/4-inch-wide minimum hot-dip galvanized steel with a minimum of 1.2 oz. of zinc coating per sq. ft.
  - 1. Tension Bands: 0.074 inch thick (14 gage) minimum.
  - 2. Brace Bands: 0.105 inch thick (12 gage) minimum.
- G. Tension Wire: 7 GA. Coil spring galvanized tension wire attached to bottom of fabric with 12 1/2 GA Galvanized hog ring spaced 24" on center.
  - 1. Coating Type II zinc in the following class as determined by ASTM A 90.
    - a. Class 2, with a minimum coating weight of 1.20 oz. per sq. ft. of uncoated wire surface.
- H. Tie Wires: 8 1/4 inch 9 GA. Aluminum tie wire and 6 1/2 inch 9 GA Aluminum tie wire spaced 15 inches on center for line posts and 24 inches on center for rails or equal, to match fabric wire.

## 2.4 GATES

- A. Fabricate perimeter frames of gates from same material and finish as fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members maximum of 8 feet apart unless otherwise indicated.
  - 1. Fabric: Same as for fence unless otherwise indicated. Secure fabric at vertical edges with tension bars and bands and to top and bottom of frame with tie wires.
  - 2. Bracing: Install diagonal cross-bracing consisting of 5/16-inch-diameter adjustable-length truss rods on gates to ensure frame rigidity without sag or twist.
- B. Swing Gates: Comply with ASTM F 900.
  - 1. Steel: Gates up to 8 feet wide:
    - a. Up to 6 Feet High: Fabricate perimeter frames of 1.660-inch minimum OD Type I or II steel pipe or 1-1/2-inch-square galvanized-steel tubing weighing 1.84 lb per sq. ft.
    - b. Over 6 Feet High: Fabricate perimeter frames of 1.90-inch minimum OD Type I or II steel pipe or 2-inch-square galvanized-steel tubing weighing 2.52 lb per sq. ft.
  - 2. Gate Hardware: Provide galvanized hardware and accessories for each gate according to the following:
    - a. Hinges: Size and material to suit gate size, non-lift-off type, offset to permit 180-degree gate opening. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
    - b. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as an integral part of latch.
    - c. Keeper: Provide a keeper for vehicle gates that automatically engages gate leaf and holds it in the open position until manually released.

- d. Gate Stops: Provide gate stops for double gates consisting of mushroom-type flush plate with anchors, set in concrete, and designed to engage a center drop rod or plunger bar. Include a locking device and padlock eyes as an integral part of the latch, permitting both gate leaves to be locked with a single padlock.

## 2.5 CONCRETE

- A. Materials: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94/C 94M. Measure, batch, and mix Project-site-mixed concrete according to ASTM C 94/C 94M.
  1. Concrete Mixes: Normal-weight concrete[ air entrained] with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.
- B. Materials: Dry-packaged concrete mix complying with ASTM C 387 for normal-weight concrete mixed with potable water according to manufacturer's written instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.
  1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
  2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, and underground structures.

### 3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

### 3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
  1. If not indicated on Drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than four times the largest cross section of post.
  2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

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- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect above ground portion of posts from concrete splatter.
    - a. Exposed Concrete: Extend concrete 2 inches above grade; shape and smooth to shed water.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.
- D. Line Posts: Space line posts uniformly at 10 feet o.c.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.
1. Locate horizontal braces at midheight of fabric 6 feet or higher, on fences with top rail and at 2/3 fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric.
1. Top Tension Wire: Install tension wire through post cap loops.
  2. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Center Rails: Install center rails in one piece between posts and flush with post on fabric side, using rail ends and special offset fittings where necessary.
- I. Bottom Rails: Install, spanning between posts.
- J. Chain-Link Fabric: Apply fabric on security side of enclosing framework. Bottom selvage shall touch finished grade. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.
- L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

- M. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

### 3.5 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

### 3.6 ADJUSTING

- A. Gate: Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
  1. After repeated operation of completed installation equivalent to 3 days' use by normal traffic, readjust gates for optimum operating condition and safety. Lubricate gate hardware and clean exposed surfaces.

END OF SECTION 323113

## SECTION 323119 – DECORATIVE METAL FENCES AND GATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Ornamental fences and gates.

#### 1.3 SUBMITTALS

- A. Product Data: Material descriptions, construction details, dimensions of individual components and profiles, and finishes for the following:
  - 1. Fence and gate posts, rails, and fittings.
  - 2. Gates and hardware.
- B. Shop Drawings: Show locations of fences and gates, posts, rails, and details of other hardware and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage and attachment and bracing.
- C. Warranties: Special warranties specified in this Section.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed ornamental fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations for Ornamental Fences and Gates: Obtain each color, grade, finish, type, and variety of component for ornamental fences and gates from one source with resources to provide ornamental fences and gates of consistent quality in appearance and physical properties.

#### 1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for ornamental fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.6 WARRANTY

- A. Materials and Workmanship. Manufacturer to warrant the original purchaser of fence and gate systems to be free from defects in material and workmanship and all fabrications to be in accordance with NAAMM steel fabrication industry tolerances and standards. Manufacturer to supply written warranty information in accordance with specification requirements.
- B. Finish Warranty. Manufacturer's standard form in which manufacturer agrees to repair finish or replace fence and gate panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
  - 1. Ameristar Montage Plus – Majestic or approved equal.

2.2 MATERIALS

- A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft<sup>2</sup>, Coating Designation G-60.
  - 1. Material for pickets shall be 3/4" square x 18 Ga. tubing.
  - 2. The rails shall be steel channel, 1.5" x 1.4375" x 14 Ga.
    - a. Picket holes in the rail shall be spaced 4.675" o.c.
  - 3. Fence posts shall be 2.5" square x 16 Ga tubing.
  - 4. Gate posts shall meet the minimum size requirements indicated in the table below:

<b>Gate Leaf Length</b>	<b>Square Tubing Size and Wall Thickness</b>
Up to 4'	2-1/2" x 14 Ga.
4'1" to 6'	3" x 12 Ga.
6'1" to 10'	4" x 11 Ga.
10'1" to 16'	6" x 3/16" wall

2.3 ORNAMENTAL FENCE AND GATE FABRICATION

- A. Form ornamental fences and gates to required shapes and sizes, true to line and level with accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.

- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
- D. Provide weep holes where water may accumulate.
- E. Fabricate panels, posts, attachments, framing, fences and gates and all supplied components per detail shop drawings supplied by manufacturer.
- F. Pattern: Provide fence and gate design with configuration as indicated on Drawings.
- G. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Commercial weight fences under ASTM F2408.

## 2.4 FINISH

- A. The manufactured panels and posts shall be subjected to an inline electrode position coating (E-Coat) process consisting of a multi-stage pretreatment/wash, followed by a duplex application of an epoxy primer and an acrylic topcoat.
  - 1. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm).
  - 2. The coated panels and posts shall meet or exceed the coating performance criteria of ASTM F2408.
  - 3. The color shall be Black.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, and underground structures.

### 3.3 INSTALLATION - GENERAL

- A. General: Install fences and gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or

concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

- B. Fences and gates. Use sleeves, inserted to depth indicated on contract drawings within proper gate post concrete foundations. Block gate posts firmly in position and hang/install gate leafs on post hinge pins. Check/adjust for proper gate leaf clearance and function. When properly positioned and firmly blocked, remove gate leafs from post hinge pins and install permanent grout in fence post holes. Reinstall gate leafs after proper cure of grout.
- C. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces:
  - 1. Remove all metal shavings from cut area.
  - 2. Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry.
  - 3. Apply 2 coats of custom finish paint matching fence color.
  - 4. Use manufacturer's spray cans or paint pens (provided expressly for that purpose) to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray.

### 3.4 INSTALLATION – GATES

- A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

### 3.5 ADJUSTING

- A. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

### 3.6 CLEANING

- A. Clean the jobsite of excess materials.
  - 1. Excavated post-hole material shall be removed from the site.

END OF SECTION 323119

## SECTION 323223 - SEGMENTAL RETAINING WALLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes segmental retaining walls with and without soil reinforcement.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide segmental retaining walls capable of withstanding the effects of gravity loads due to soil pressures resulting from grades indicated, and determined according to NCMA's "Design Manual for Segmental Retaining Walls."
  - 1. Include the effects of sloped backfill as indicated on Drawings.
  - 2. Include the effects of superimposed loads (surcharge) as indicated on Drawings.
- B. Seismic Performance: Provide segmental retaining walls capable of withstanding the effects of earthquake motions determined according to NCMA's "Segmental Retaining Walls--Seismic Design Manual."
  - 1. Seismic Design Criteria: as required by Agencies having Jurisdiction.
- C. Drainage: Provide segmental retaining wall drainage system capable of preventing accumulation of groundwater in retained soils and in retaining wall foundation soils.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. For installed systems indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Samples for Verification: For each color and texture of concrete unit required. Submit sections of units not less than 3 inches square.
  - 1. Include one full-size unit for each type of concrete unit required.
- C. Qualification Data: For Installer and professional engineer.
- D. Preconstruction Test Reports: For segmental retaining wall system.

- E. Product Certificates: For segmental retaining wall units and soil reinforcement, signed by product manufacturer.
  - 1. Include test data for shear strength between segmental retaining wall units according to NCMA SRWU-2.
  - 2. Include test data for connection strength between segmental retaining wall units and soil reinforcement according to NCMA SRWU-1.

## 1.5 QUALITY ASSURANCE

- A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform the following preconstruction testing:
  - 1. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
  - 2. Test soil reinforcement and backfill materials for pullout behavior according to GRI GG5 or GRI GT6.
  - 3. Test soil reinforcement and backfill materials for coefficient of friction according to ASTM D 5321.
- B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects.
  - 1. Build mockups for each type of segmental retaining wall in sizes approximately 72 inches long by 36 inches high above finished grade at front of wall.
    - a. Include typical base and cap or finished top construction.
    - b. Include backfill to typical finished grades at both sides of wall.
    - c. Include typical end construction at one end of mockup.
    - d. Include 36-inch return at 1 end of mockup, with typical corner construction.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle concrete units and accessories to prevent deterioration or damage due to moisture, temperature changes, contaminants, breaking, chipping, or other causes.
- B. Store geosynthetics in manufacturer's original packaging with labels intact. Store on elevated platforms, protected from moisture, sunlight, chemicals, flames, temperatures above 160 deg F or below 32 deg F, and other conditions that might damage them. Verify identification of geosynthetics before using and examine them for defects as material is placed.

## PART 2 - PRODUCTS

### 2.1 SEGMENTAL RETAINING WALL UNITS

- A. Concrete Units: ASTM C 1372, Normal Weight, except that units shall not differ in height more than plus or minus 1/16 inch from specified dimension.

1. Provide units that comply with requirements for freeze-thaw durability.
  2. Provide units that interlock with courses above and below by means of integral lugs or lips, pins, or clips.
- B. Colors: As selected by Architect from manufacturer's full range.
- C. Shapes: Provide units of any basic shape and dimensions that will produce segmental retaining walls of dimensions and profiles indicated without interfering with other elements of the Work and as follows:
1. Exposed Face: Machine-split textured, shaped face with deeply beveled vertical edges.
  2. Batter: Provide units that offset from course below to provide at least 1:24 batter.
- D. Cap Units: Provide cap units of same shape as other units with smooth, as-cast top surfaces without holes or lugs.
- E. Special Units: Provide corner units, end units, and other shapes as needed to produce segmental retaining walls of dimensions and profiles indicated and to provide texture on exposed surfaces matching face.

## 2.2 INSTALLATION MATERIALS

- A. Pins: Product supplied by segmental retaining wall unit manufacturer for use with units provided, made from nondegrading polymer reinforced with glass fibers.
- B. Clips: Product supplied by segmental retaining wall unit manufacturer for use with units provided, made from nondegrading polymer reinforced with glass fibers.
- C. Cap Adhesive: Product supplied or recommended by segmental retaining wall unit manufacturer for adhering cap units to units below.
- D. Leveling Base: Comply with requirements in Division 2 Section "Subdrainage" for drainage fill.
- E. Drainage Fill: Comply with requirements in Division 2 Section "Subdrainage."
- F. Reinforced Soil Fill: Comply with requirements in Division 2 Section "Earthwork" for satisfactory soils.
- G. Nonreinforced Soil Fill: Comply with requirements in Division 2 Section "Earthwork" for satisfactory soils.
- H. Filter Fabric: Comply with requirements in Division 2 Section "Subdrainage."
- I. Drainage Pipe: Comply with requirements in Division 2 Section "Subdrainage."
- J. Soil Reinforcement: Product specifically manufactured for use as soil reinforcement and as follows:
1. Product Type: Molded geogrid made from high-density polyethylene.
  2. Physical Properties: As required for completed segmental retaining walls to comply with performance requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for excavation tolerances, condition of subgrades, and other conditions affecting performance of segmental retaining walls.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 RETAINING WALL INSTALLATION

- A. General: Place units according to NCMA's "Segmental Retaining Wall Installation Guide" and segmental retaining wall unit manufacturer's written instructions. Lay units in running bond.
  - 1. Form corners and ends by using special units.
- B. Leveling Base: Place and compact base material to thickness indicated and with not less than 95 percent maximum dry unit weight according to ASTM D 698.
- C. Leveling Course: Place unreinforced lean concrete over base course to thickness indicated; compact and screed to a smooth, level surface.
- D. First Course: Place first course of segmental retaining wall units on leveling base/course for full length of wall. Place units in firm contact with each other, properly aligned and level.
  - 1. Place and compact fill, either drainage or soil fill as indicated, to top of first course. Place fill on both sides of wall at same time without disturbing alignment of units. Fill voids between and within units with drainage fill.
- E. Subsequent Courses: Remove excess fill and debris from tops of units in course below. Place units in firm contact, properly aligned, and directly on course below.
  - 1. For units with lugs designed to fit into holes in adjacent units, lay units so lugs are accurately aligned with holes, and bedding surfaces are firmly seated on beds of units below.
  - 2. For units with lips at front of units, slide units as far forward as possible for firm contact with lips of units below.
  - 3. For units with pins, install pins and align units according to manufacturer's written instructions.
  - 4. For units with clips, install clips and align units according to manufacturer's written instructions.
  - 5. Place fill on both sides of wall at same time, where both sides are indicated to be filled.
  - 6. Fill voids between and within units with drainage fill.
- F. Cap Units: Place cap units and secure with cap adhesive according to manufacturer's written instructions.

### 3.3 FILL PLACEMENT

- A. General: Comply with requirements in Division 2 Section "Earthwork," NCMA's "Segmental Retaining Wall Installation Guide," and segmental retaining wall unit manufacturer's written instructions.

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- B. Place, spread, and compact fill in uniform lifts for full width and length of embankment as wall is laid. Begin at back of wall and place and spread fill toward embankment.
1. Use only hand-operated compaction equipment within 48 inches of wall, or one-half of height above bottom of wall, whichever is greater.
  2. Compact drainage fill to not less than 95 percent maximum dry unit weight according to ASTM D 698.
  3. Compact reinforced soil fill to not less than 95 percent maximum dry unit weight according to ASTM D 698.
    - a. In areas where only hand-operated compaction equipment is allowed, compact to not less than 90 percent maximum dry unit weight according to ASTM D 698.
  4. Compact nonreinforced soil fill to comply with Division 2 Section "Earthwork."
- C. Place filter fabric against back of wall and place layer of drainage fill at least 12 inches deep behind filter fabric to within 12 inches of finished grade. Place another layer of filter fabric between drainage fill and soil fill.
1. Wrap drainage pipe with filter fabric and place in drainage fill as indicated, sloped 1:50 to drain.
  2. Place impervious fill over top edge of drainage fill layer.
- D. Place soil reinforcement in horizontal joints of retaining wall where indicated and according to soil reinforcement manufacturer's written instructions. Embed reinforcement a minimum of 8 inches into retaining wall and stretch tight over compacted backfill. Anchor soil reinforcement before placing fill on it.
1. Place additional soil reinforcement at corners and curved walls to provide continuous reinforcement and to comply with manufacturer's written instructions.
  2. Place geosynthetics with seams, if any, oriented perpendicular to segmental retaining walls.
  3. Do not dump fill material directly from trucks onto geosynthetics.
  4. Place at least 6 inches of fill over reinforcement before compacting with tracked vehicles or 4 inches before compacting with rubber-tired vehicles.
  5. Do not turn vehicles on fill until first layer of fill is compacted and second layer is placed over each soil-reinforcement layer.

### 3.4 CONSTRUCTION TOLERANCES

- A. Variation from Level: For bed-joint lines along walls, do not exceed 1-1/4 inches in 10 feet, 3 inches maximum.
- B. Variation from Indicated Batter: For slope of wall face, do not vary from indicated slope by more than 1-1/4 inches in 10 feet.
- C. Variation from Indicated Wall Line: For walls indicated as straight, do not vary from straight line by more than 1-1/4 inches in 10 feet.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Comply with requirements in Division 2 Section "Earthwork" for in-place compaction testing.

1. In each compacted backfill layer, perform at least 1 field in-place compaction test for each 150 feet or less of segmental retaining wall length.

### 3.6 ADJUSTING AND CLEANING

A. Remove and replace segmental retaining wall construction of the following description:

1. Broken, chipped, stained, or otherwise damaged units. Units may be repaired if methods and results are approved by Architect.
2. Segmental retaining walls that do not match approved Samples and mockups.
3. Segmental retaining walls that do not comply with other requirements indicated.

B. Replace units so segmental retaining wall matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.

END OF SECTION 323223

## SECTION 328400 – IRRIGATION SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Underground irrigation system with piping, valves, heads, water source, pump, control equipment, and other items as indicated on the drawings.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Irrigation system shall be installed in accordance with the plans, details and notes prepared by Irrigation Consultant.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Qualification Data: For qualified Installer.
- C. Field quality-control reports.
- D. Record Drawings: Include the following, as required by authorities having jurisdiction, for use by surveyor in preparing record drawings:
  - 1. Designation, size and length of irrigation pipe.
  - 2. Designation and location of irrigation zones.
  - 3. Designation and location of irrigation sprinkler type.
- E. Operation and Maintenance Data: For sprinklers, controllers and automatic control valves to include in operation and maintenance manuals.
- F. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed projects of similar design and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for irrigation system shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

PART 2 - PRODUCTS (Refer to Plans, Details & Notes prepared by Irrigation Consultant)

PART 3 - EXECUTION (Refer to Plans, Details & Notes prepared by Irrigation Consultant)

END OF SECTION 328400

## SECTION 329200 - TURF AND GRASSES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Hydroseeding.
  - 2. Sodding.
  - 3. Planting soil and amendments.
  - 4. Erosion-control materials (turf related only)
  - 5. Grass paving.
  - 6. Maintenance.

#### 1.3 SUBMITTALS

- A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
    - 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.
  - B. Material Test Reports: Soil analysis report for existing in-place surface soil and/or imported topsoil.
    - 1. Report shall be provided at least 15 days prior to incorporation of soil amendments, delivery of offsite topsoil, or initiation of seeding or sodding as applicable.
    - 2. Report shall include, at a minimum, the following information at each sample location:
      - a. soil pH.
      - b. Organic content.
      - c. Gradation.
      - d. Presence of deleterious matter.
      - e. Presence of problem salts, minerals, or heavy metals.
      - f. Plant nutrient content.
      - g. Recommendations for amendments and/or corrective actions, for each sample location, to provide suitable topsoil for healthy growth of specified turf.
- 1) Report shall include detailed specifications for content, quantity, and quality of each required soil amendment, including but not limited to:
    - a) Inorganic soil amendments.
    - b) Organic soil amendments.
    - c) Fertilizers.

3. Soil testing laboratory shall oversee soil sampling with depth, location, and number of samples to be taken pre-approved by the Architect.
  - a. A minimum of three (3) representative samples shall be obtained for each athletic field site to be sodded (9 total samples).
  - b. A minimum of 5 additional samples shall be taken at random locations for other turf areas located outside of athletic field limits (hydroseed areas).
- C. Sod Installation Schedule: Provide schedule of installation dates for sod. Do not install dormant sod without prior approval of Architect.
- D. Minutes of preinstallation conference.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful turfgrass establishment.
  1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that soil preparation and grass planting is in progress.
  2. Professional Membership: Installer shall be a North Carolina Registered Landscape Contractor in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  3. Experience: Five years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
- B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Preinstallation Conference: Conduct conference at Project site.
- D. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.
- C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

D. Grass Paving Materials:

1. Protect grass paving units from damage during delivery. Store under tarp to protect from sunlight when time from delivery to installation exceeds one week.
2. Where applicable, store proprietary growth mediums provided with paving units in a dark and dry location.

1.6 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade, base course, or setting beds.
- B. Planting Restrictions: Hydroseed and/or install sod during normal planting seasons for type of lawn work required. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion. Contractor shall assure established lawn prior to Substantial Completion. Coordinate planting areas with overall project schedule accordingly.
- C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.7 MAINTENANCE SERVICE

- A. Maintenance Service: Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until Final Completion of project.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species as follows:
  1. Seed: as indicated on Plant Schedule.

## 2.2 TURFGRASS SOD

- A. Turfgrass Sod: Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
1. Turfgrass Species: as indicated on Plant Schedule.
  2. Sod shall be delivered to the project site within twenty four (24) hours after harvest at the nursery, and shall be sheltered from the sun and wind until planted by the Contractor.
  3. Contractor shall lay sod within thirty six (36) hours after harvest. Sod shall not be laid where the roots have dried due to exposure from the sun and wind, or has thinned for these or other reasons.

## 2.3 INORGANIC SOIL AMENDMENTS

- A. Provide inorganic soil amendments in quantities and proportions recommended by soil analysis report.

## 2.4 ORGANIC SOIL AMENDMENTS

- A. Provide organic soil amendments in quantities and proportions recommended by soil analysis report.

## 2.5 FERTILIZERS

- A. Provide fertilizers in quantities and proportions recommended by soil analysis report.

## 2.6 PLANTING SOILS

- A. At Contractor's option, provide one or more of the following planting soils. All soils used for planting shall be prepared as necessary using soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce satisfactory planting soil suitable for healthy, viable turf.
1. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
    - a. Supplement with another specified planting soil when quantities are insufficient.
    - b. Mix existing, native surface topsoil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.
  2. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.

3. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs, or marshes.
  - a. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes; grubs; or other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
  - b. Mix imported topsoil or manufactured topsoil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.

## 2.7 HYDROSEEDING MULCH

- A. Fiber Mulch: Biodegradable, non-dyed wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

## 2.8 PESTICIDES AND HERBICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

## 2.9 EROSION-CONTROL MATERIALS

- A. Turf Reinforcement Mat: Three dimensional, woven, highly UV resistant, polypropylene geotextile specifically designed for erosion control applications on steep slope and high velocity, vegetated waterway applications. Conforming to FHWA FP-03, Section 713.18. Include manufacturer's recommended installation anchor materials.

1. Products: Subject to compliance with requirements and approval of Architect.

## 2.10 GRASS-PAVING MATERIALS

- A. Grass Paving Units: Lightweight, injection-molded, non-biodegradable, plastic units designed to contain small areas of growth medium and to enhance the ability of turf to support vehicular and pedestrian traffic without rutting or significant compaction of the growth medium. Units shall be of manufacturer's standard nominal mat thickness. Include manufacturer's recommended anchorage system and any additional products supplied by manufacturer as an integral part of a complete installed system.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Invisible Structures, Inc.; GrassPave2.
- A. Sandy Gravel Base Course (SGBC): Specified in Division 31 Section "Earth Moving".
- B. Sand: Natural or manufactured sand in accordance with the gradation requirements for Fine Aggregate 2S or 2MS as defined in Section 1005 and 1006 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- C. Proprietary Growing Mix: Where applicable, as supplied by the manufacturer as an integral part of a complete installed system.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect adjacent and adjoining areas from hydroseeding overspray.
  - 2. Protect grade stakes set by others until directed to remove them.

- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  - 1. Apply fertilizer directly to subgrade before loosening.
  - 2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
    - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    - b. Mix lime with dry soil before mixing fertilizer.
  - 3. Spread planting soil to the depth indicated or to a min. depth of 8 inches, but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
    - a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.
    - b. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
  - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
  - 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
    - a. Apply fertilizer directly to surface soil before loosening.
  - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
  - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
  - 1. Athletic Fields: in addition to above seedbed and grade preparation, athletic fields shall have an additional requirement of smoothness. Finished grade (topsoil) at acceptance shall have no high or low spots greater than 1/2" in 10'.
    - a. Field areas located in unchanged or cut conditions shall have an additional excavation requirement of 18" below finished grade. Remove and replace top 18" of existing soil prior to completion of finished grade.

- E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

#### 3.4 TURF REINFORCEMENT MAT (TRM)

- A. Prepare area as specified in "Turf Area Preparation" Article.
- B. For turf reinforcement mat, install planting soil in two lifts, with second lift equal to thickness and on top of the mat.
- C. Install mat and fasten as instructed by material manufacturer.
- D. Fill cells of turf reinforcement mat with planting soil and compact before planting.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

#### 3.5 GRASS-PAVING SYSTEM

- A. Verify that the Sandy Gravel Base Course (SGBC) has been installed in accordance with the requirements of Division 31 Section "Earth Moving", and that its dry, at proper grade and cross-section, uncontaminated by soil deposits, and in suitable condition to begin paving.
  - 1. Do not proceed with installation of paving until unsatisfactory conditions have been corrected and SGBC has been approved.
- B. Install proprietary growing mix as instructed by paving-material manufacturer for site conditions; comply with details shown on Drawings. Compact according to paving-material manufacturer's written instructions.
- C. Install paving mat and fasten according to paving-material manufacturer's written instructions.
  - 1. Provide space for expansion as indicated or, where not indicated, as instructed by the manufacturer.
- D. Before planting, fill cells of paving mat with [sand] [sand/planting soil mix] as indicated on Drawings and compact according to manufacturer's written instructions.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Plant as indicated on Drawings, in other articles of this specification, and in accordance with grass paving material manufacturer's written instructions.

#### 3.6 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

### 3.7 SODDING

- A. Lay sod within 36 hours of harvesting. Do not lay sod if ground is frozen or muddy.
  1. Do not lay dormant sod without prior approval of Architect.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

### 3.8 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
- B. Watering
  1. Acceptable Watering Methods:
    - a. Water Truck
    - b. Irrigation
    - c. Other methods as approved by Owner
  2. Keep turf sufficiently watered throughout the maintenance period through the completion of the warranty period.
  3. Contractor to create a temporary watering schedule for turf establishment in areas where there is no irrigation installed.
  4. If irrigation is installed, plans for utilization of in-ground irrigation systems shall be submitted for approval prior to use.
  5. Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources to keep turf uniformly moist to a depth of 4 inches.
  6. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  7. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- C. Mowing: Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades

bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow bermudagrass to a height of 1/2 to 1 inch.

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

E. TOPDRESSING / SETTLEMENT

1. If lawn areas do not have the level of smoothness specified herein or turf areas have depressions, tire rutting, or rutting caused by mowers or other equipment stop dressing(s) will be required to correct the uneven grade at contractor's expense. Top dressing material will be sand as specified herein.
2. Maintain ground top surfaces to the finish grades shown on the drawings and deposit whatever top dressing may be required to correct any settlement or erosion that occurs prior to the date of Final Acceptance. The surface upon which additional topdressing is to be deposited shall be raked or otherwise satisfactorily prepared to ensure a proper bond. Fill depressions that develop from settling, tire rutting, or mowing to the finished elevations with topdressing material.

### 3.9 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

### 3.10 PESTICIDE AND HERBICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written instructions. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

### 3.11 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
  - 1. Unless otherwise instructed, do not permit traffic on grass paving areas until turf is established:
    - a. For a minimum of 8 weeks on seeded grass pavements.
    - b. For a minimum of 4 weeks on sodded grass pavements.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 329200

## SECTION 329300 - PLANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Plants.
  - 2. Planting soil and amendments
  - 3. Tree stabilization.
  - 4. Landscape edgings.
  - 5. Mulch.
  - 6. Maintenance.

#### 1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.
- D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.
- E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.
- H. Finish Grade: Elevation of finished surface of planting soil.

- 
- I. **Manufactured Topsoil:** Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
  - J. **Pesticide:** A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
  - K. **Pests:** Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
  - L. **Planting Area:** Areas to be planted.
  - M. **Planting Soil:** Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
  - N. **Plant; Plants; Plant Material:** These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
  - O. **Root Flare:** Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
  - P. **Stem Girdling Roots:** Roots that encircle the stems (trunks) of trees below the soil surface.
  - Q. **Subgrade:** Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
  - R. **Subsoil:** All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
  - S. **Surface Soil:** Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- 1.4 SUBMITTALS
- A. **Material Test Reports:** Soil Analysis Report.
  - B. **Warranty:** Sample of special warranty.
  - C. **Minutes of preinstallation conference.**
- 1.5 QUALITY ASSURANCE
- A. **Installer Qualifications:** A qualified landscape Installer whose work has resulted in successful establishment of plants.

- 
- B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
1. Report suitability of tested soil for plant growth.
    - a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.
- D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
- F. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
- G. Preinstallation Conference: Conduct conference at Project site.
- H. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.
- C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.
- D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- E. Handle planting stock by root ball.
- F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.
- G. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
  1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
  2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
  3. Do not remove container-grown stock from containers before time of planting.
  4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

#### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
  1. Notify Owner no fewer than two days in advance of proposed interruption of each service or utility.
  2. Do not proceed with interruption of services or utilities without Owner's written permission.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.
- C. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
  1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

## 1.8 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
    - b. Structural failures including plantings falling or blowing over.
  2. Warranty Periods from Date of Final Completion:
    - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
    - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
    - c. Annuals: Three months.
  3. Include the following remedial actions as a minimum:
    - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
    - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
    - c. Provide extended warranty for period equal to original warranty period, for replaced plant material

## 1.9 MAINTENANCE SERVICE

- A. Maintenance Service for Plants: Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until date of Final Completion.

## PART 2 - PRODUCTS

### 2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
  2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

- B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

## 2.2 INORGANIC SOIL AMENDMENTS

- A. Provide inorganic soil amendments in quantities and proportions recommended by soil analysis report.

## 2.3 ORGANIC SOIL AMENDMENTS

- A. Provide organic soil amendments in quantities and proportions recommended by soil analysis report.

## 2.4 FERTILIZERS

- A. Provide fertilizers in quantities and proportions recommended by soil analysis report.

## 2.5 PLANTING SOILS

- A. At Contractor's option, provide one or more of the following planting soils. All soils used for planting shall be prepared as necessary using soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce satisfactory planting soil suitable for healthy, viable plants.
  - 1. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.
  - 2. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
    - a. Supplement with another specified planting soil when quantities are insufficient.
    - b. Mix existing, native surface topsoil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.
  - 3. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.

4. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs, or marshes.
  - a. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes; grubs; or other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
  - b. Mix imported topsoil or manufactured topsoil with soil amendments and fertilizers in the quantities recommended in the soil analysis report to produce planting soil.

## 2.6 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
  1. Type: as indicated on Plant Schedule.
  2. Size Range for chipped or shredded mulch (where applicable): 3 inches maximum, 1/2 inch minimum.
  3. Color: Natural.

## 2.7 PESTICIDES AND HERBICIDES

- A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

## 2.8 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:
  1. Upright and Guy Stakes: Rough-sawn, sound, new wood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
  2. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.
  3. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.

- a. Products: Subject to compliance with requirements and approval of Architect.
- 4. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.
- 5. Proprietary Staking Devices: Proprietary stake and adjustable tie systems to secure each new planting by plant stem; sized as indicated and per manufacturer's written recommendations.
  - a. Products: Subject to compliance with requirements and approval of Architect.

## 2.9 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- B. Burlap: Non-synthetic, biodegradable.
- C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

- B. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

### 3.3 PLANTING AREA ESTABLISHMENT

- A. Loosen subgrade of planting areas to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them.
  - 1. Apply fertilizer and soil amendments after fine grading and mix thoroughly into upper 2 inches of soil.
  - 2. Fertilizer and other necessary soil amendments shall be applied at the rate recommended by the soil analysis.
- B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

### 3.4 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 60-degree angle. Excavations with vertical sides shall be avoided. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling.
  - 1. Excavate approximately three times as wide as root ball diameter.
  - 2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
  - 3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
  - 4. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
  - 5. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
- B. Subsoil and topsoil removed from excavations may be used as planting soil for individually planted trees that are not located within a prepared plant bed.
- C. Obstructions: Notify Owner if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

### 3.5 TREE, SHRUB, AND VINE PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
  - 1. Use excavated soil for backfill.
  - 2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
  - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
  - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
  - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
- D. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
  - 1. Use excavated soil for backfill.
  - 2. Carefully remove root ball from container without damaging root ball or plant.
  - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
  - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
  - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
- E. Set fabric bag-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
  - 1. Use excavated soil for backfill.
  - 2. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
  - 3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
  - 4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
  - 5. Continue backfilling process. Water again after placing and tamping final layer of soil.
- F. Set and support bare-root stock in center of planting pit or trench with root flare 2 inches above adjacent finish grade.

1. Use excavated soil for backfill.
  2. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots.
  3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside soil-covered roots about 1 inch from root tips; do not place tablets in bottom of the hole or touching the roots.
  4. Continue backfilling process. Water again after placing and tamping final layer of soil.
- G. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

### 3.6 MECHANIZED TREE SPADE PLANTING

- A. Trees may be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than the manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.
- B. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.
- C. Cut exposed roots cleanly during transplanting operations.
- D. Use the same tree spade to excavate the planting hole as was used to extract and transport the tree.
- E. Plant trees as shown on Drawings, following procedures in "Tree, Shrub, and Vine Planting" Article.
- F. Where possible, orient the tree in the same direction as in its original location.

### 3.7 TREE, SHRUB, AND VINE PRUNING

- A. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- B. Do not apply pruning paint to wounds.

### 3.8 TREE STABILIZATION

- A. Install trunk stabilization staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.9 GROUND COVER PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.
- E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING AREA MULCHING

- A. Mulch backfilled surfaces of planting areas and other areas indicated.
  - 1. Trees and Tree-like Shrubs in Turf Areas: Apply mulch ring of 3-inch average thickness, with 30-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks.
  - 2. Mulch in Planting Areas: Apply 3-inch average thickness of mulch as indicated on Drawings. Extend at least 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.11 EDGING INSTALLATION

- A. Shovel-Cut Edging: Separate mulched areas from turf areas with a 45-degree, 4- to 6-inch-deep, shovel-cut edge as shown on Drawings.

3.12 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

3.13 PESTICIDE AND HERBICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.
- C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.14 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.15 DISPOSAL

- A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them.

END OF SECTION 329300

## SECTION 331100 - WATER DISTRIBUTION SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes water-distribution piping and related components outside the buildings for water service and fire-service mains.
- B. The Section includes general requirements that will apply to all water systems. In addition, the operating utility (the authority having jurisdiction) has numerous specific requirements for materials and execution that are too varied to cover in this specification.
  - 1. For this Project, the operating utility is Two Rivers Utilities.
  - 2. Materials and execution requirements that are not covered in this Section shall comply with the requirements of the operating utility.
  - 3. Materials and execution requirements that are covered, but are in conflict with the requirements of the operating utility, shall comply with the higher quality or more restrictive requirement.
- C. Utility-furnished products include water meters that will be installed by the utility upon completion of utility required preparations by Contractor.

#### 1.3 DEFINITIONS

- A. CTS: Copper Tubing Size.
- B. DIP: Ductile iron pipe.
- C. EPDM: Ethylene propylene diene terpolymer rubber.
- D. HDPE: High density polyethylene pipe.
- E. LLDPE: Linear, low-density polyethylene plastic.
- F. NPS: Nominal pipe size.
- G. PE: Polyethylene plastic.
- H. PVC: Polyvinyl chloride plastic.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Ductile iron pipe.
  - 2. Polyvinyl chloride pipe.
  - 3. Tees, elbows, reducers and similar fittings.
  - 4. Joint restraint.
  - 5. Valves and valve boxes.
  - 6. Tapping sleeve assemblies.
  - 7. Fire hydrants.
  - 8. Backflow preventers.
  - 9. Service connection piping and fittings
  - 10. Corrosion-protection piping encasement.
- B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.
- C. Bacteriological test reports.
- D. Record Drawings: Include the following, as required by authorities having jurisdiction, for use by Owner's surveyor in preparing record drawings:
  - 1. Location of water mains from centerline of road or curb. Contractor shall coordinate with Owners surveyor to allow for location of water main prior to backfilling.
  - 2. Location of fire hydrants, valves, tees, elbows, reducers, and other fittings.
  - 3. Location and elevation of any other below ground appurtenances.
  - 4. Designation, size and length of water lines between fittings.
  - 5. Location and depth below finished grade of service connections.
- E. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  - 2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
  - 3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Preinstallation Conference: Conduct conference to comply with requirements in Division 01 Section "Project Management and Coordination."
  - 1. Review methods and procedures related to water system installation including, but not limited to, the following:
    - a. Review requirements of the operating utility.
    - b. Review site conditions and preparatory work.
    - c. Review requirements for protecting work.

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- d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - e. Review inspection schedule and procedures required to monitor and document quality assurance.
- C. Piping materials shall bear label, stamp, or other markings of specified testing agency.
  - D. Comply with ASTM F 645 for selection, design, and installation of thermoplastic (PVC and HDPE) water piping.
  - E. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.
  - F. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.
  - G. NSF Compliance: Comply with NSF 61 for materials for water-service piping and specialties for domestic water.
  - H. Lead Free Requirement: Section 1417 of the Federal Safe Drinking Water Act has mandated that "Any pipe, solder, or flux used after June 19, 1986, in the installation or repair of public water systems and plumbing used for drinking water must be "Lead Free". The act defines "Lead Free" as less than 0.2-percent lead in solder and flux and less than 8.0-percent lead in pipes and fittings.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:
    - 1. Ensure that valves are dry and internally protected against rust and corrosion.
    - 2. Protect valves against damage to threaded ends and flange faces.
    - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
  - B. During Storage: Use precautions for valves, including fire hydrants, according to the following:
    - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
    - 2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
  - C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use hand wheels or stems as lifting or rigging points.
  - D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
  - E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
  - F. Protect flanges, fittings, and specialties from moisture and dirt.
  - G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

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1.7 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:
1. Notify Architect, Owner, and Utility having jurisdiction no fewer than two days in advance of proposed interruption of service.
  2. Do not proceed with interruption of water-distribution service without Architect's written permission.

1.8 COORDINATION

- A. Where required, coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 STANDARDS OF OPERATING UTILITY

- A. See paragraph 1.2.B above for information regarding materials standards of the operating utility.

2.2 DUCTILE-IRON PIPE (DIP)

- A. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless mechanical joint or flanged ends are indicated on Drawings or required by operating utility.
1. Gaskets: AWWA C111, rubber. Use only non-toxic lubricants approved by the manufacturer and that will not support microbiological growth. Vegetable shortening shall not be used.
  2. Pressure class: Class 350 for NPS 3 to NPS 12; Class 250 for NPS 14 and larger.
  3. Cement mortar lining: AWWA C 104, standard thickness.
  4. Laying length: 18 feet-0 inches to 20 feet-0 inches.
  5. Pipe size: No metric sized pipe shall be permitted.
  6. Testing: All pipe lengths shall be tested to 500 psi working pressure prior to shipping.
  7. Marking: Clearly mark each joint of pipe at convenient intervals, as follows:
    - a. Manufacturer's name.
    - b. Nominal pipe size.
    - c. Letters "DI" or "Ductile".
    - d. Weight.
    - e. Pressure Class.
  8. Products: Subject to compliance with requirements, provide products by one of the following:
    - a. American-Cast Iron Pipe Co.
    - b. Griffin Pipe Co.
    - c. McWane Cast Iron Pipe Co..
    - d. U.S. Pipe Co.

- B. Flanged Joints: where indicated on Drawings or where required by operating utility and in accordance with standards of operating utility.
- C. Mechanical Joints: where indicated on Drawings or where required by operating utility and in accordance with standards of operating utility.

### 2.3 POLYVINYL CHLORIDE PLASTIC PIPE (PVC)

- A. PVC, AWWA Pipe: AWWA C900 (4" thru 12" NPS) or AWWA C905 (14" and larger NPS), Class 235, with bell end with gasket, and with spigot end.
  - 1. Gaskets: ASTM F 477, rubber. Use only non-toxic lubricants approved by the manufacturer and that will not support microbiological growth. Vegetable shortening shall not be used.
  - 2. Joints: ASTM D 3139.
  - 3. Laying length: 18 feet-0 inches to 20 feet-0 inches
  - 4. Pipe size: comply with outside diameter dimensions of DIP.
  - 5. Standard dimension ratio: SDR 18.
  - 6. Pipe color: blue.
  - 7. Comply with UL 1285 for fire-service mains if indicated.
  - 8. The use of solvent weld joints is prohibited.
  - 9. Marking: Clearly mark each joint of pipe at convenient intervals, as follows:
    - a. Manufacturer's name.
    - b. Nominal pipe size.
    - c. Pressure class.
    - d. Material designation.
    - e. National Sanitation Foundation (NSF) seal.

### 2.4 FITTINGS (NPS 3 AND LARGER)

- A. Mechanical-Joint, Ductile-Iron Fittings: For NPS 3 and larger, AWWA C110, ductile-iron standard pattern or AWWA C153, ductile-iron compact pattern. For NPS 2 and smaller see "Service Connections" article below.
  - 1. Glands and Gaskets: AWWA C111, ductile-iron glands, rubber gaskets. Use only non-toxic lubricants approved by the manufacturer and that will not support microbiological growth. Vegetable shortening shall not be used.
  - 2. Nuts and Bolts: 316 Stainless Steel, material shall be marked on nuts and bolts.
  - 3. Material: Cast iron fittings are not permitted.
  - 4. Pressure class: Class 250.
  - 5. Fitting size: Metric sized fittings are not permitted.
  - 6. Cement mortar lining: AWWA C 104, standard thickness.
  - 7. Products: Subject to compliance with requirements, provide products by one of the following:
    - a. American-Cast Iron Pipe Co.
    - b. Griffin Pipe Co.
    - c. McWane Cast Iron Pipe Co..
    - d. U.S. Pipe Co.

## 2.5 RESTRAINED JOINTS

- A. Push-on (DIP only) or mechanical joint type joint restraint where indicated on Drawings or where required by operating utility and in accordance with standards of operating utility.
1. Push-on Gaskets: AWWA C 111, for use on DIP only, approved for use on the pipe on which it is installed. Use only non-toxic lubricants approved by the manufacturer and that will not support microbiological growth. Vegetable shortening shall not be used.
  2. Mechanical Joint Glands, Gaskets and Bolts: AWWA C 111, the gland, gasket and bolts shall be part of an integral system by the same manufacturer and approved for use on the pipe on which it is installed. Installation shall require only standard mechanical joint assembly techniques. Bolts shall be 316 Stainless Steel. Use only non-toxic lubricants approved by the manufacturer and that will not support microbiological growth. Vegetable shortening shall not be used.
  3. DIP Pressure Rating: 350 psi.
  4. PVC Pressure Rating: rated at a 2:1 safety factor for the pipe on which it is installed.
  5. Products: Subject to compliance with requirements, provide products by one of the following:
    - a. American-Cast Iron Pipe Co.
    - b. Griffin Pipe Co.
    - c. McWane Cast Iron Pipe Co..
    - d. U.S. Pipe Co.
    - e. Ebba Iron Inc.
    - f. Ford Meter Box Co.
    - g. Sigma Corporation.

## 2.6 VALVES (NPS 3 AND LARGER)

- A. General:
1. For NPS 2 and smaller: see "Service Connections" article below.
  2. Available Manufacturers: Subject to compliance with these requirements and the standards of operating utility, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American AVK Co.; Valves & Fittings Div.
    - b. American Cast Iron Pipe Co.; American Flow Control Div.
    - c. Crane Co.; Crane Valve Group.
    - d. East Jordan Iron Works, Inc.
    - e. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
    - f. McWane, Inc.; Kennedy Valve Div.
    - g. McWane, Inc.; M & H Valve Company Div.
    - h. McWane, Inc.; Tyler Pipe Div.; Utilities Div.
    - i. Mueller Co.; Water Products Div.
    - j. U.S. Pipe and Foundry Company.
  3. Opening direction: As required by operating utility.
  4. Operating system: 2" square operating nut for below grade installation, wheel for above grade or vault installations.
  5. Exterior Nuts and Bolts: 316 stainless steel
  6. Interior Coating: Complying with AWWA C550.
- B. AWWA, Gate Valves:

1. Nonrising-Stem, Resilient-Seated Gate Valves:

a. Description: For NPS 3 to NPS 12, gray- or ductile-iron body and bonnet; with bronze or ductile-iron gate, resilient seats, bronze stem, and stem nut.

- 1) Standard: AWWA C509.
- 2) Minimum Pressure Rating: 250 psig.
- 3) End Connections: AWWA C 111, mechanical joint.

C. UL/FMG, Gate Valves:

1. OS&Y, Rising-Stem Gate Valves:

a. Description: Iron body and bonnet and bronze seating material.

- 1) Standards: UL 262 and FMG approved.
- 2) Minimum Pressure Rating: 175 psig.
- 3) End Connections: Flanged.

D. Tapping-Sleeve Assemblies:

1. Description: Sleeve and valve compatible with drilling machine.

- a. Standard: MSS SP-60.
- b. Tapping Sleeve: Ductile-iron or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
- c. Pressure Rating: 250 psig.
- d. Tapping Valve: AWWA C 509, cast or ductile-iron, nonrising-stem, resilient-seated gate valve.
- e. Valve End Connections: Flanged (ANSI B16.1) for end mating tapping-sleeve flange and mechanical joint (AWWA C111) for opposite end.

2.7 VALVE ACCESSORIES (NPS 3 AND LARGER)

A. Valve Boxes:

1. Material: Cast or ductile-iron, suitable for heavy traffic use and conforming to ASTM A-48, Class 20.

a. Available Manufacturers: Subject to compliance with these requirements and the standards of operating utility, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1) East Jordan Iron Works
- 2) Tyler Pipe
- 3) Bingham and Taylor.

- b. Model: as required by the operating utility.
- c. Elevation Adjustment: as required by operating utility.
- d. Inside Shaft Diameter: 5-1/4 inches.
- e. Coating: Asphaltic, not less than 1 mil thick.
- f. Cover: Heavy cast iron with the word WATER cast in raised letters.

- g. Base: Enlarged to enclose and protect valve operating nut without actually being in contact with pipe or valve.

B. Valve Box Protection Rings:

- 1. Material: Reinforced, precast 3,000 psi concrete.
  - a. Inside diameter: 9-1/4 inches.
  - b. Outside Diameter: 27 inches.
  - c. Thickness” 5 inches at inner diameter with top tapering to 2 inches at outer diameter.
  - d. Reinforcing: Two #3 rebar, one at 21 inch diameter and one at 24 inch diameter.
  - e. Min. Weight: 110 lbs.

2.8 FIRE HYDRANTS

A. Dry-Barrel Fire Hydrants:

- 1. Available Manufacturers: Subject to compliance with these requirements and the standards of authorities having jurisdiction, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. American AVK Co.; Valves & Fittings Div.
  - b. American Cast Iron Pipe Co.; American Flow Control Div.
  - c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - d. American Foundry Group, Inc.
  - e. East Jordan Iron Works, Inc.
  - f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
  - g. McWane, Inc.; Kennedy Valve Div.
  - h. McWane, Inc.; M & H Valve Company Div.
  - i. Mueller Co.; Water Products Div.
  - j. Troy Valve; a division of Penn-Troy Manufacturing, Inc.
  - k. U.S. Pipe and Foundry Company.
- 2. Description: Freestanding, with one NPS 4-1/2 and two NPS 2-1/2 outlets, 5-1/4-inch main valve, drain valve, and NPS 6 mechanical-joint inlet. Include interior coating according to AWWA C550. Hydrant shall have cast-iron body, compression-type valve opening against pressure and closing with pressure.
  - a. Standard: AWWA C502.
  - b. Pressure Rating: 150 psig minimum.
  - c. Outlet Threads: NFPA 1963, with external hose thread used by local fire department. Include cast-iron caps with steel chains.
  - d. Operating and Cap Nuts: Pentagon, 1-1/2 inches point to flat.
  - e. Direction of Opening: as required by authorities having jurisdiction.
  - f. Exterior Finish: Paint type and colors as required by authorities having jurisdiction.

2.9 WATER METERS

- A. See paragraph 1.2.C above regarding water meters.

## 2.10 BACKFLOW PREVENTERS

### A. Reduced-Pressure-Principle Backflow Preventers:

1. Available Manufacturers: Subject to compliance with these requirements and the standards of authorities having jurisdiction, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Flomatic Corporation.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Plumbing Products Group; Wilkins Water Control Products Div.
2. Standard: AWWA C511 and any other requirements of authorities having jurisdiction.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 12 psig maximum, through middle 1/3 of flow range.
5. Size: as indicated on Drawings.
6. Body: Cast iron with interior lining complying with AWWA C550.
7. End Connections: Flanged.
8. Configuration: Designed for horizontal, straight through flow.

### B. Reduced-Pressure-Detector, Fire-Protection Backflow Preventer Assemblies:

1. Available Manufacturers: Subject to compliance with these requirements and the standards of authorities having jurisdiction, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
  - b. Conbraco Industries, Inc.
  - c. FEBCO; SPX Valves & Controls.
  - d. Watts Water Technologies, Inc.
  - e. Zurn Plumbing Products Group; Wilkins Water Control Products Div.
2. Standards: ASSE 1047 and UL listed or FMG approved.
3. Operation: Continuous-pressure applications.
4. Size: as indicated on Drawings.
5. Body: Cast iron with interior lining complying with AWWA C550.
6. End Connections: Flanged.
7. Configuration: Designed for horizontal, straight through flow.

## 2.11 CONCRETE VAULTS

### A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858.

1. Access Hatch: of type and configuration required by operating utility.
  - a. Size: Sufficient to allow easy removal of equipment housed by vault.
  - b. Material: Aluminum.
  - c. Load Rating:
    - 1) 300 psf for hatches not subjected to traffic.

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- 2) AASHTO H-20 for hatches in traffic areas.
  - d. Available Manufacturers: Subject to compliance with these requirements and the standards of operating utility, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Bilco Co.
    - 2) US Foundry, Inc.
    - 3) Halliday Products, Inc.
  - 2. Drain: ASME A112.6.3, cast-iron floor drain with outlet of size indicated. Include body anchor flange, light-duty cast-iron grate, bottom outlet, and integral or field-installed bronze ball or clapper-type backwater valve.
- 2.12 SERVICE CONNECTIONS (NPS 3 AND SMALLER)
- A. Copper Tubing and Fittings
    - 1. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
      - a. Copper, Pressure-Seal Fittings: wrought-copper fitting with EPDM O-ring seal in each end.
      - b. Copper, Solder-Joint Fittings: Only acceptable where other connections will not work. ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
    - B. PVC Pipe: Schedule 40 in accordance with ASTM D 1785, with solvent cement joints in accordance with ASTM D 2564 and fitting in accordance with ASTM D 2466.
      - 1. Marking: Clearly mark each joint of pipe at convenient intervals, as follows:
        - a. Manufacturer's name.
        - b. Nominal pipe size.
        - c. Pressure class.
        - d. Material designation.
        - e. National Sanitation Foundation (NSF) seal.
  - C. Tapping Saddles and Sleeves: in accordance with standards of operating utility.
  - D. Corporation Stops: in accordance with standards of operating utility.
  - E. Curb Stops: in accordance with standards of operating utility.
  - F. Meter Boxes: in accordance with standards of operating utility.
  - G. Water Meters: see paragraph 1.2.C regarding water meters.
  - H. Miscellaneous Fittings: in accordance with standards of operating utility.
- 2.13 CORROSION-PROTECTION PIPING ENCASEMENT
- A. Encasement for Underground Metal Pipe, Fittings and Appurtenances:

1. Standards: ASTM A 674 or AWWA C105.
2. Form: Tube.
3. Material: LLDPE film of 0.008-inch minimum thickness.
4. Color: Blue.

#### 2.14 PIPE DETECTION MATERIALS

- A. Detectable Warning Tape: specified in Section titled "Earth Moving".
- B. Locator Wire In addition to warning tape where required by operating utility. Specified in Section titled "Earth Moving".

### PART 3 - EXECUTION

#### 3.1 STANDARDS OF OPERATING UTILITY

- A. See paragraph 1.2.B above for information regarding execution standards of the operating utility.

#### 3.2 EARTHWORK

- A. Refer to Section titled "Earth Moving" for excavating, trenching, and backfilling.
- B. Refer to Section titled "Earth Moving" for installation requirements of pipe detection materials.

#### 3.3 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
  1. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
  2. Do not use flanges or unions for underground piping.
  3. Flanges, unions, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
  4. Restrained joints shall be provided where required by the operating utility and where indicated on Drawings.
  5. Underground Water Main Piping NPS 3 and larger shall be the following, subject to approval by the operating utility and as indicated on the Drawings:
    - a. Ductile-iron, push-on-joint pipe with ductile-iron, mechanical-joint fittings and gasketed joints.
    - b. PVC, push-on-joint pipe with ductile-iron, mechanical-joint fittings and gasketed joints.
- B. Above Ground and Vault Water Main Piping NPS 3 and larger shall be ductile-iron, mechanical or flanged joint pipe and ductile-iron-pipe appurtenances; and gasketed, restrained joints.
- C. Underground Water-Service Piping NPS 3/4 to NPS 2 shall be the following, subject to approval by the operating utility:

1. Soft copper tubing with copper, pressure-seal fittings and pressure-sealed joints. Wrought-copper, solder-joint fittings only where other connections will not work.

### 3.4 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use flanged-end valves for installation above ground or in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation stops and curb stops with ends compatible with piping, for NPS 2 and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  1. Underground Valves for Water Mains: NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.
  2. Use the following for valves in vaults and above ground:
    - a. Gate Valves for Water Mains: NPS 3 and Larger: AWWA, cast iron, OS&Y rising stem, resilient seated.
    - b. Gate Valves for Fire Protection Lines: NPS 3 and Larger: UL/FMG, cast iron, OS&Y rising stem.

### 3.5 PIPING INSTALLATION

- A. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.
  1. Make connections larger than NPS 2 with tapping machine according to the following:
    - a. Install tapping sleeve and tapping valve according to MSS SP-60.
    - b. Install tapping sleeve on pipe to be tapped. Position flanged outlet for tapping valve.
    - c. Install tapping valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
    - d. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Extract bit and close valve. Remove tapping machine.
    - e. Slightly open valve briefly to flush out filings. Close valve and connect water-piping.
- B. Install ductile-iron pipe according to AWWA C600, AWWA M41 and the standards of the operating utility.
  1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- C. Install PVC, AWWA pipe according to ASTM F 645, AWWA M23 and the standards of the operating utility.
- D. Install copper tubing according to CDA's "Copper Tube Handbook" and the standards of the operating utility.
- E. Install Schedule 40 PVC according to ASTM D 2774, ASTM F 645 and the standards of the operating utility.

- F. Install fire-service-main piping according to NFPA 24 and standards of authorities having jurisdiction
  - 1. For DIP, install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- G. Bury piping with depth of cover over top at least 36 inches, with top at least 12 inches below level of maximum frost penetration.
- H. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.
- I. Install underground piping with restrained joints at horizontal and vertical changes in direction, at locations indicated on Drawings and where required by the operating utility. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports as accepted by the operating utility.

### 3.6 JOINT CONSTRUCTION

- A. Make pipe joints according to the following (as applicable):
  - 1. Ductile-Iron Piping, Gasketed Joints for Water Main Piping : AWWA C600, AWWA C111 AWWA M41 and standards of authorities having jurisdiction.
  - 2. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194 and standards of authorities having jurisdiction.
  - 3. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139, pipe manufacturer's written instructions and standards of authorities having jurisdiction.
  - 4. Copper-Tubing, Pressure-Sealed Joints: Use procedure recommended by copper, pressure-seal-fitting manufacturer.
  - 5. Schedule 40 PVC Piping: in accordance with ASTM D 2564 and standards of authorities having jurisdiction.
  - 6. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with correct OD, and with system working pressure at least equal to pipe. Install according to fitting manufacturer's written instructions

### 3.7 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water system piping with restrained joints at horizontal and vertical changes in direction, at locations indicated on Drawings, and where required by the operating utility. Subject to acceptance by the operating utility, anchorages and restrained-joint types that may be used include the following:
  - 1. Concrete thrust blocks.
  - 2. Set-screw mechanical retainer glands.
  - 3. Bolted flanged joints.
  - 4. Heat-fused joints.
  - 5. Pipe clamps and tie rods.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:

1. Gasketed-Joint, Ductile-Iron, Water- Piping: According to AWWA C600 and the standards of the operating utility.
  2. Gasketed-Joint, PVC Water- Piping: According to AWWA M23 and the standards of the operating utility.
  3. Fire-Service-Main Piping: According to NFPA 24 and the standards of jurisdictions having authority.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

### 3.8 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600, AWWA M44 and standards of the operating utility. Install each underground valve with stem pointing up and with valve box.
- B. UL/FMG, Gate Valves: Comply with NFPA 24 and standards of authorities having jurisdiction. Install each underground valve and valves in vaults with stem pointing up.
- C. Corporation and Curb Stops: Install according to the manufacturer's written instructions and to the standards of the operating utility with head pointed up and with service box.

### 3.9 FIRE HYDRANT INSTALLATION

- A. General: Install each fire hydrant with separate and adjoining gate valve in supply pipe, anchor with restrained joints or thrust blocks to standards of operating utility, and support in upright position.
- B. AWWA Fire Hydrants: Comply with AWWA M17, standards of operating utility, and standards of authorities having jurisdiction.

### 3.10 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties, according to standards of the operating utility, ready to receive water meter installation by utility.

### 3.11 WATER METER BOX INSTALLATION

- A. Install meter boxes according to the manufacturer's written instructions and the standards of the operating utility.
- B. Install water meter boxes in paved areas flush with surface.
- C. Install water meter boxes in grass or earth areas with top 2 inches above surface.

### 3.12 BACKFLOW PREVENTER INSTALLATION

- A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing health department and authorities having jurisdiction.

- B. Do not install backflow preventers that have relief drain in vault, or in other spaces subject to flooding, without adequate provisions for drainage.
- C. Do not install bypass piping around backflow preventers.
- D. Support NPS 2-1/2 and larger backflow preventers, valves, and piping near floor and on brick or concrete piers.

### 3.13 CONCRETE VAULT INSTALLATION

- A. Install precast concrete vaults according to ASTM C 891, the standards of the operating utility, and the standards of the authorities have jurisdiction.
- B. Install access hatch according to the manufacturer's written instructions, the standards of the operating utility, and the standards of the authorities have jurisdiction.

### 3.14 SERVICE CONNECTION INSTALLATION

- A. Extend water-service piping and connect to water meter and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.

### 3.15 PIPE DETECTION MATERIALS INSTALLATION

- A. Install continuous underground detectable warning tape and locator wire, where required by operating utility, during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping and according to standards of operating utility. Pipe detection materials are specified in Section titled "Earth Moving."

### 3.16 FIELD QUALITY CONTROL

- A. Hydrostatic Test: Conduct test according to AWWA C 600 or C 605, as applicable, and the standards of the authorities having jurisdiction.
  - 1. Pre-testing: The Contractor shall conduct his on pre-tests and confirm that the system is capable of passing prior to requesting the Architect's presence to witness the test.
    - a. Conduct pre-tests only after all installation is complete including joint restraint. Concrete thrust blocks shall have been in place long enough to have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
    - b. Leaks shall be immediately repaired and the test shall be repeated until acceptable results are obtained.
    - c. The Contractor shall notify the Architect at least 48 hours before the scheduled time of the official test. Passing test performed without the Architect present will be rejected. The Contractor will be required to retest, with the Architect present, without additional compensation.

2. Test Procedures: The line shall be slowly filled with water and all air expelled through air valves or other means. A suitable test pump, water meter and potable water source, furnished by the Contractor, shall be connected to the line by means of a tap (or other suitable means) in the line and the proper test pressure slowly applied to the line. The test pressure shall be maintained for at least two hours.
  - a. Test at not less than 150 psi or one-and-one-half times working pressure, whichever is larger, for two hours. If pressure falls more than 5 psi during the test, the pump shall be reactivated and the pressure restored to the starting pressure as often as necessary. At the end of two hours, the pressure shall be restored to the starting pressure a final time and the total quantity of water used (leakage) to maintain the pressure for two hours shall be read.
  - b. Open and close each valve within the system several times during the test period.
  - c. Service connections, if present, shall be subjected to the hydrostatic test concurrently with the main lines.
3. Allowable Leakage: Allowable leakage shall be determined by the following formula:
  - a.  $L = 0.000007SD\sqrt{P}$
  - b. Where:
  - c. L = allowable leakage in gallons per hour.
  - d. S = the total length of the pipe tested in feet.
  - e. D = the nominal diameter of the pipe in inches.
  - f. P = the average test pressure in psi gauge.
- B. Preliminary Inspection: Make arrangements with Architect to conduct preliminary final inspection.
  1. Pre-inspection: The Contractor shall conduct his own pre-inspection and confirm that the system is capable of passing prior to requesting the Architect's presence to witness the preliminary inspection.
    - a. Repair or remove and replace components where test results or pre-inspections indicate that they do not comply with specified requirements.
  2. Preliminary Inspection: The Contractor shall notify the Architect at least 48 hours before the scheduled time of the preliminary inspection.
    - a. Preliminary inspection shall include but shall not necessarily be limited to the following (as applicable):
      - 1) A visual inspection of fire hydrants: Requirements include: verification that hydrant is plumb and at correct elevation, verification that caps are in place and operational, verification that hydrant is operational and that no apparent leakage exists, verification that gate valve is in place and operational, verification that hydrant finish is adequate, verification that hydrant location is correct.
      - 2) A visual inspection of valves: Requirements include: verification that valves are operational, verification that valve boxes are centered, plumb, at correct elevation, and properly backfilled, verification that valve indicates that water line is at adequate depth, verification that valve location is correct, verification that valve protection rings are properly installed, and verification that any valve appurtenances are properly installed and functioning.
      - 3) A visual inspection of connections to existing water system: Requirements include: verification of adequacy of connection work, verification that

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- leakage does not exist, verification that connection valve is off, verification that safeguards are in place to prevent contamination of existing system by backflow from the new system.
- 4) A visual inspection of water meters, backflow preventers and other appurtenances to confirm proper installation.
- b. Repair or remove and replace components where test results or preliminary final inspections indicate that they do not comply with specified requirements.
  - c. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Final Inspection: Upon successful completion of the preliminary inspection and after any required documentation has been received and approved by the authorities having jurisdiction, the Contractor, Architect, representatives of the authorities having jurisdiction shall conduct a final inspection of the system.
- a. The Contractor shall notify the Architect at least 48 hours before the desired time of the pre-inspection. The Architect shall endeavor to schedule attendance by representatives of the authorities having jurisdiction at the desired time; however, the Architect provides no guarantee of availability at that time. If unavailable, the Architect will schedule the representative at the soonest reasonable time. Final inspections will not be held without the attendance of both the Architect and a representative of the authorities having jurisdiction.
  - b. Final inspection shall include but shall not necessarily be limited to the items listed for the pre-inspection.
  - c. Repair or remove and replace components where test results or final inspections indicate that they do not comply with specified requirements.
  - d. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Reports of Inspection Activities.
1. Where required, the Architect will provide final required documentation to authorities having jurisdiction for the purpose of obtaining a Permit to Operate. Promptly provide any documents required from Contractor. Once Permit to Operate is received, Architect will notify Contractor. Make final connections, when necessary, and place system in operation. Do NOT place system in operation before notification by Architect that Permit to Operate has been received.

### 3.17 DISINFECTION AND BACTERIOLOGICAL TESTING

- A. Clean and disinfect water-distribution piping as follows:
1. Purge and disinfect according to AWWA C 651 and standards of authorities having jurisdiction.
    - a. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
      - 1) Provide adequate openings to ensure that required flushing velocities are met.
      - 2) Where applicable, provide protective measures as required to ensure that flushing waters do not damage property or cause erosion or flooding.

- b. Fill lines to be disinfected with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for at least 24 hours.
- c. At end of retention time, perform concentration testing of solution at the extreme end of the lines to be disinfected. Solution shall contain not less than 25 ppm of chlorine. If residual chlorine is less than 25 ppm, repeat procedure.
- d. Once an acceptable residual chlorine count is obtained, flush system with clean, potable water until no chlorine remains in water coming from the system.

B. Bacteriological Testing:

- 1. Perform bacteriological testing according to AWWA C 651 and the standards of the authorities having jurisdiction.
  - a. Using methods acceptable to the Architect and authorities having jurisdiction, take two successive samples, at each dead-end line and at points deemed representative of the water in the newly constructed mains, at a period of at least 24 hours apart.
    - 1) A test for residual chlorine content must be performed within 15 minutes of the time that the sample is drawn. Residual chlorine must be below the level required by AWWA C 651 and the authorities having jurisdiction.
  - b. Perform tests, at an independent laboratory certified by the authorities having jurisdiction, for coliform growth, non-coliform growth and residual chlorine.
  - c. Should the test values exceed the maximum acceptable values permitted by the authorities having jurisdiction, repeat disinfection, flushing and testing until acceptable values are obtained (with the exception of residual chlorine, in which case the samples are considered invalid and system must be only be flushed and retested).
  - d. Prepare reports of purging, disinfecting, and testing activities, including water sample chain of custody and copies of passing bacteriological tests, and provide to Architect.
    - 1) No more than 30 days can have passed between the time that the first passing sample is drawn and the time the corresponding bacteriological test results are submitted, along with all other required water system closeout documents, to the authorities having jurisdiction.
  - e. After passing samples are obtained, make arrangements for follow-up samples to be taken by the authorities having jurisdiction.
  - f. As before, should the test values of the follow-up samples exceed maximum acceptable values, repeat disinfection, flushing and testing until acceptable values are obtained.

END OF SECTION 331100

## SECTION 333100 – GRAVITY FLOW SANITARY SEWERAGE SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes gravity sanitary sewer piping and related components outside the buildings.
- B. The Section includes general requirements that will apply to all gravity sanitary sewerage systems. In addition, the operating utility (the authority having jurisdiction) has numerous specific requirements for materials and execution that are too varied to cover in this specification.
  1. For this Project, the operating utility is Two Rivers Utilities.
  2. Materials and execution requirements that are not covered in this Section shall comply with the requirements of the operating utility.
  3. Materials and execution requirements that are covered, but are in conflict with the requirements of the operating utility, shall comply with the higher quality or more restrictive requirement.

#### 1.3 DEFINITIONS

- A. DIP: Ductile iron pipe.
- B. LLDPE: Linear, low-density polyethylene plastic.
- C. NPS: Nominal pipe size.
- D. PP: Polypropylene plastic.
- E. PVC: Polyvinyl chloride plastic.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
  1. Polyvinyl chloride pipe.
  2. Wyes, elbows, reducers and similar fittings.
  3. Precast concrete manholes, frame and covers, and related components.
  4. Cleanout caps and covers.
  5. Grease traps.

- B. Field quality-control test reports.
- C. Record Drawings: Include the following, as required by authorities having jurisdiction, for use by Owner's surveyor in preparing record drawings:
  - 1. Designation, size and length of sewer lines between manholes or cleanouts.
  - 2. Location and depth below finished grade of service connections to sewer main.
  - 3. Location and elevation of any other below ground appurtenances.
- D. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Comply with requirements of the authorities having jurisdiction.
  - 2. Comply with standards of operating utility for sanitary sewer-service piping, including materials, installation, and testing.
- B. Preinstallation Conference: Conduct conference to comply with requirements in Division 01 Section "Project Management and Coordination."
  - 1. Review methods and procedures related to sanitary sewerage installation including, but not limited to, the following:
    - a. Review requirements of the operating utility.
    - b. Review site conditions and preparatory work.
    - c. Review requirements for protecting work.
    - d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - e. Review inspection schedule and procedures required to monitor and document quality assurance.
- C. Piping materials shall bear label, stamp, or other markings of specified testing agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic materials in direct sunlight. Support to prevent sagging and bending.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes and precast concrete structures, according to manufacturer's written rigging instructions.

#### 1.7 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewer Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sanitary sewer service according to requirements indicated:
  - 1. Notify Architect, Owner, and Utility having jurisdiction no fewer than two days in advance of proposed interruption of service.

2. Do not proceed with interruption of water-distribution service without Architect's written permission.

## 1.8 COORDINATION

- A. Where required, coordinate connection to existing sewer lines with operating utility.

## PART 2 - PRODUCTS

### 2.1 STANDARDS OF OPERATING UTILITY

- A. See paragraph 1.2.B above for information regarding materials standards of the operating utility.

### 2.2 DUCTILE-IRON PIPE AND FITTINGS (DIP)

- A. Push-on-Joint, Ductile-Iron Pipe: ASTM A 746, with push-on-joint bell and plain spigot ends.
  1. Gaskets: AWWA C111, rubber. Use only lubricants approved by the manufacturer.
  2. Fittings: AWWA C110 or AWWA C153.
  3. Pressure class: Class 150 minimum or as required by agency having jurisdiction.
  4. Interior Lining: Ceramic Epoxy (Protecto 401 or approved equal), 40 mil thickness.
  5. Laying length: 18 feet-0 inches to 20 feet-0 inches.
  6. Pipe size: No metric sized pipe shall be permitted.
  7. Marking: Clearly mark each joint of pipe at convenient intervals, as follows:
    - a. Manufacturer's name.
    - b. Nominal pipe size.
    - c. Letters "DI" or "Ductile".
    - d. Weight.
    - e. Pressure Class.
  8. Products: Subject to compliance with requirements, provide products by one of the following:
    - a. American-Cast Iron Pipe Co.
    - b. Griffin Pipe Co.
    - c. McWane Cast Iron Pipe Co..
    - d. U.S. Pipe Co.

### 2.3 POLYVINYL CHLORIDE PLASTIC PIPE AND FITTINGS (PVC)

- A. PVC Sewer Pipe (ASTM): ASTM D 3034, Class 150, with bell end with gasket, and with spigot end.
  1. Gaskets: ASTM F 477, rubber. Use lubricants approved by the manufacturer.
  2. Fittings: ASTM D 3034. Use of saddle type fittings is prohibited.
  3. Joints: ASTM D 3212.
  4. Laying length: 18 feet-0 inches to 20 feet-0 inches
  5. Pipe size: comply with outside diameter dimensions of DIP.
  6. Standard dimension ratio: SDR 35, unless otherwise indicated on Drawings.

7. Pipe color: green.
8. The use of solvent weld joints is prohibited.
9. Marking: Clearly mark each joint of pipe at convenient intervals, as follows:
  - a. Manufacturer's name.
  - b. Nominal pipe size.
  - c. Pressure class.
  - d. Material designation.
  - e. National Sanitation Foundation (NSF) seal.

## 2.4 MANHOLES

- A. Standard Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
  1. Diameter: 48 inches minimum or as required to accommodate pipe size, unless otherwise indicated.
  2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  4. Inverts (channels and benches): See "Concrete" article below.
  5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
  6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
  8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
  9. Steps: Individual ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12 to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
  10. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and diameter matching manhole frame and cover. Include sealant recommended by ring manufacturer.
  11. Manhole Frames and Covers: Ferrous; 24 inch ID by 7 to 9 inch riser with 4 inch minimum width flange and 26 inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "SANITARY SEWER" shall be cast.
    - a. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise

## 2.5 FIELD INSTALLED PIPE TO MANHOLE CONNECTORS

- A. Resilient Pipe Connectors: ASTM C 923, design specifically for field installation, for each pipe connection.

## 2.6 CLEANOUTS

- A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.
  - 1. Manufacturers:
    - a. Canplas Inc.
    - b. IPS Corporation.
    - c. NDS Inc.
    - d. Plastic Oddities, Inc.
    - e. Sioux Chief Manufacturing Company, Inc.
    - f. Zurn Industries, Inc.; Zurn Light Commercial Specialty Plumbing Products.
- B. Frame and Cover: Traffic grade cast-iron according to the standards of the authorities having jurisdiction, as indicated or, where not indicated, in accordance with the following:
  - 1. Use medium-duty, top-loading classification cleanouts in landscaped and foot-traffic areas.
  - 2. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
  - 3. Use extra-heavy-duty, top-loading classification cleanouts in roads areas.
- C. Concrete Collar: Where not located as a casting embedded in pavement, provide cast-in-place concrete collar as indicated on Drawings or, where not indicated 18 by 18 by 12 inches deep.

## 2.7 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and stainless steel tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  - 1. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded Flexible Couplings: Elastomeric sleeve with stainless steel shear ring and stainless steel-metal tension band and tightening mechanism on each end.
  - 1. Manufacturers:
    - a. Dallas Specialty & Mfg. Co.
    - b. Fernco Inc.
    - c. Logan Clay Products Company (The).
    - d. Mission Rubber Company; a division of MCP Industries, Inc.
    - e. NDS Inc.
    - f. Plastic Oddities, Inc.
- D. Ring-Type Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.
  - 1. Manufacturers:
    - a. Fernco Inc.

- b. Logan Clay Products Company (The).
- c. Mission Rubber Company; a division of MCP Industries, Inc.

## 2.8 GREASE TRAPS

- A. Description: Precast, reinforced-concrete vault, designed for A-16 load designation according to ASTM C 857 and made according to ASTM C 858, with internal; grease trap configuration as indicated on Drawings.
  - 1. Dimensions: as indicated on Drawings.
  - 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  - 3. Riser Sections: ASTM C 478, precast, reinforced concrete, 4-inch minimum thickness, and lengths to provide depth indicated.
  - 4. Manhole Frames and Covers: Ferrous; 24 inch ID by 7 to 9 inch riser with 4 inch minimum width flange and 26 inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "SANITARY SEWER" shall be cast.
    - a. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise
  - 5. Internal Components: as indicated on Drawings.

## 2.9 CONCRETE

- A. General: Portland Cement Concrete in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
  - 1. Design Mix: 3000 psi minimum, with 0.45 maximum water-cementitious materials ratio.
  - 2. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 3. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.
- B. Manhole Channels and Benches: Field formed from concrete.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: Minimum of 1 percent or as required to provide uniform slope between invert elevations indicated on Drawings.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: 8 percent.
- C. Ballast and Pipe Supports: Field formed from concrete.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.10 CORROSION-PROTECTION PIPING ENCASUREMENT

- A. Encasement for Underground Metal Pipe, Fittings and Appurtenances:
1. Standards: ASTM A 674 or AWWA C105.
  2. Form: Tube.
  3. Material: LLDPE film of 0.008-inch minimum thickness.
  4. Color: Blue.

2.11 PIPE DETECTION MATERIALS

- A. Detectable Warning Tape: specified in Section titled "Earth Moving".
- B. Locator Wire In addition to warning tape where required by operating utility. Specified in Section titled "Earth Moving".

PART 3 - EXECUTION

3.1 STANDARDS OF OPERATING UTILITY

- A. See paragraph 1.2.B above for information regarding execution standards of the operating utility.

3.2 EARTHWORK

- A. Refer to Section titled "Earth Moving" for excavating, trenching, and backfilling.
- B. Refer to Section titled "Earth Moving" for installation requirements of pipe detection materials.

3.3 PIPING APPLICATIONS

- A. Flexible pipe couplings may be used in applications below, unless otherwise indicated.
1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping of different material type or size, unless otherwise indicated. No other use of flexible couplings will be permitted.
    - a. Unshielded flexible couplings for same or minor difference OD pipes.
    - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
- B. Gravity-Flow, Nonpressure Sewer Piping: Use the following pipe materials as indicated on the Drawings.
1. Ductile-iron, gravity sewer pipe; ductile-iron standard or compact fittings; gaskets; and gasketed joints.
  2. PVC sewer pipe and fittings, gaskets, and gasketed joints.

### 3.4 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, and other installation requirements.
- C. Install manholes for changes in direction, unless fittings are indicated. Use fittings for service branch connections, unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or combination of both.
- F. Install gravity-flow, nonpressure, sanitary sewerage piping according to the following:
  - 1. Install piping pitched down in direction of flow, at the slope indicated or, where not indicated, at a minimum slope of 1/2 percent.
  - 2. Install piping with 36-inch minimum cover unless otherwise indicated.
  - 3. Install ductile-iron, gravity sewer piping according to ASTM A 746 and the standards of the operating utility.
  - 4. Install ductile-iron and special fittings according to AWWA C600, AWWA M41 and the standards of the operating utility.
  - 5. Install PVC sewer piping according to ASTM D 2321, ASTM F 1668 and the standards of the operating utility.
- G. Install corrosion-protection piping encasement over ductile-iron pipe and fittings according to ASTM A 674 or AWWA C105 and the standards of the operating utility.
- H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

### 3.5 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure, sanitary sewerage piping according to the following:
  - 1. Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints and the standards of the operating utility.
  - 2. Join ductile-iron and special fittings according to AWWA C600, AWWA M41 and the standards of the operating utility.
  - 3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints and the standards of the operating utility.
  - 4. Join dissimilar pipe materials with nonpressure-type, flexible couplings in accordance with manufacturer's written instructions.

### 3.6 MANHOLE INSTALLATION

- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Form continuous concrete channels and benches between inlets and outlet.
- D. For manholes that occur in pavements, set tops of frames and covers flush with finished surface. Set tops 2 inches above finished surface elsewhere, unless otherwise indicated.

### 3.7 CONCRETE PLACEMENT

- A. Comply with the requirements of Section 825 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures for transporting and placing concrete

### 3.8 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use pipe fittings of same material as pipe at branches for cleanouts and PVC pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- B. Install cast-iron frames and covers.
  - 1. Use medium-duty, top-loading classification cleanouts in landscaped and foot-traffic areas.
  - 2. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
  - 3. Use extra-heavy-duty, top-loading classification cleanouts in roads areas.
  - 4. Set cleanout frames and covers located in earthen areas in cast-in-place concrete collar, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade
  - 5. Set cleanout frames and covers in pavement with tops flush with pavement surface.

### 3.9 SERVICE CONNECTION INSTALLATION

- A. Extend sanitary sewer-service piping and connect to building sanitary sewer system at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate sanitary sewer service piping at building wall until building sanitary sewer piping is installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building sanitary sewer piping systems when those systems are installed.

### 3.10 CONNECTIONS TO EXISTING SANITARY SEWER

- A. Where required by operating utility, connections to existing piping or manholes shall be made in the presence of an authorized inspector. Notify the Architect at least 48 hours before starting a connection.
- B. Where indicated, construct new manhole over existing gravity main by cutting upper half of existing pipe after base of manhole is completed so as not to obstruct flow of the existing pipe.

- C. Where indicated, make connections to existing piping using commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete.
- D. Where indicated, make connections to existing underground manholes as follows:
1. Core drill opening into existing manhole large enough to allow installation of resilient manhole connector.
  2. Install resilient manhole connector in manhole opening accordance with manufacturer's written instructions.
  3. Install pipe in resilient connector in accordance with manufacturer's written instructions.
  4. Cut end of connection pipe passing through manhole wall to be flush with inside wall, unless otherwise indicated.
  5. On outside of manhole wall, encase entering connection and pipe in 6 inches of concrete for minimum length of 12 inches to provide additional support of connector from connection to undisturbed ground.
  6. On inside of manhole wall, encase outside of pipe to flush with face of wall with grout. Form smooth invert channel transition to existing invert or complete installation of internal drop piping as applicable.
  7. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
- E. Protect piping and manholes to prevent concrete or debris from entering while making connections. Remove debris or other extraneous material that may accumulate.

### 3.11 PIPE DETECTION MATERIALS INSTALLATION

- A. Install continuous underground detectable warning tape and locator wire, where required by operating utility, during backfilling of trench for underground sanitary sewerage piping. Locate below finished grade, directly over piping and according to standards of operating utility. Pipe detection materials are specified in Section titled "Earth Moving."

### 3.12 FIELD QUALITY CONTROL

- A. During Installation: Inspect interior of piping, to determine whether line displacement or other damage has occurred, continuously during installation. Inspect after approximately 24 inches of backfill is in place, and again at completion of each section of piping between manholes.
1. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 95 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping or manholes.
    - d. Infiltration: Water leakage into piping or manholes.
    - e. Exfiltration: Water leakage from or around piping.
  2. Replace defective piping and manholes using new materials, and repeat inspections until defects are within allowances specified.

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- B. Testing: The Contractor shall notify the Architect at least 48 hours before the scheduled time of the official tests. Passing test performed without the Architect present will be rejected. The Contractor will be required to retest, with the Architect present, without additional compensation
1. Pipe deflection test: Each section of piping will be tested for internal diametric deflection by the use of a 5% mandrel.
    - a. The mandrel pull shall be performed according to the "Recommended Standards for Wastewater Facilities" by the Great Lakes - Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten State Standards)" and the standards of the operating utility.
    - b. The Contractor shall not use any mechanical device for the mandrel pull.
    - c. Deflections of greater than 5% shall be corrected.
  2. Low Pressure Air Tests: Test gravity sewer piping according to UNI-B-6, and the standards of operating utility.
    - a. Prior to performing test, system shall be backfilled to final grade and a waiting period, specified by the operating utility, shall have passed.
    - b. All service connections shall be in place prior to testing.
    - c. Leaks and loss in test pressure constitute defects that must be repaired.
    - d. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
- C. Preliminary Inspection: Make arrangements with Architect to conduct preliminary final inspection.
1. Pre-inspection: The Contractor shall conduct his own pre-inspection and confirm that the system is capable of passing prior to requesting the Architect's presence to witness the preliminary inspection.
    - a. Repair or remove and replace components where test results or pre-inspections indicate that they do not comply with specified requirements.
    - b. Remove all sand, dirt, brick, excess grout, and other foreign matter from manholes and piping. Material shall not be flushed into existing sewer lines
  2. Preliminary Inspection: The Contractor shall notify the Architect at least 48 hours before the scheduled time of the preliminary inspection.
    - a. Preliminary inspection shall include but shall not necessarily be limited to the following:
      - 1) A visual inspection of manholes. Requirements include: verification that manhole is plumb and at correct elevation; verification that frame and cover is properly installed, centered, grouted inside and out, and at proper elevation; verification that section joints are sealed watertight and properly grouted; verification that inverts and shelves are smooth, of correct slope, and properly formed; verification that steps are properly positioned, securely embedded, and undamaged; verification that drop manhole piping is properly installed and secure; verification that pipe openings are watertight, properly located, and properly grouted; verification that interior of manhole has been cleaned of dirt and construction debris and verification that grades in the vicinity of the manhole are properly established and well drained.

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- 2) A visual inspection of piping. Requirements include: verification that piping is clean and unobstructed; verification that piping is straight and not visually deflected from a circular cross-section (i.e.: full moon when flashed or lamped); verification that no infiltration or exfiltration is visually evident.
  - 3) Verification of proper elevations, slopes, and horizontal and vertical alignment (under no circumstances will a line be accepted which is below the minimum slope required by the authorities having jurisdiction for a given line size.
- b. Repair or remove and replace components where test results or preliminary inspections indicate that they do not comply with specified requirements.
  - c. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Final Inspection: Upon successful completion of the preliminary final inspection and after any required documentation has been received and approved by the authorities having jurisdiction, the Contractor, Architect, representatives of the authorities having jurisdiction shall conduct a final inspection of the system.
- a. The Contractor shall notify the Architect at least 48 hours before the desired time of the pre-inspection. The Architect shall endeavor to schedule attendance by representatives of the authorities having jurisdiction at the desired time; however, the Architect provides no guarantee of availability at that time. If unavailable, the Architect will schedule the representative at the soonest reasonable time. Final inspections will not be held without the attendance of both the Architect and a representative of the authorities having jurisdiction.
  - b. Final inspection shall include but shall not necessarily be limited to the items listed for the pre-inspection.
  - c. Repair or remove and replace components where test results or final inspections indicate that they do not comply with specified requirements.
  - d. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Video Documentation: Immediately after final approval of the completed system, complete a videotaped inspection of the completed piping system utilizing equipment made expressly for the purpose. Provide a written report, inspection logs, and a copy of the inspection videotape to the Architect.
- F. Reports of Inspection Activities.
1. Where required, the Architect will provide final required documentation to authorities having jurisdiction for the purpose of obtaining a Permit to Operate. Promptly provide any documents required from Contractor. Once Permit to Operate is received, Architect will notify Contractor. Make final connections, when necessary, and place system in operation. Do NOT place system in operation before notification by Architect that Permit to Operate has been received.

END OF SECTION 333100

## SECTION 334100 - STORM DRAINAGE SYSTEM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes gravity-flow, nonpressure storm drainage outside the building with the following components:
  - 1. Pipe culverts.
  - 2. Drainage structures.
  - 3. Channel drainage systems.
  - 4. Outlet protection.

#### 1.3 DEFINITIONS

- A. Drainage Structures: catch basins, curb inlets, junction boxes, weir inlets, pond outlet structures.
- B. NPS: Nominal pipe size
- C. PP: Polypropylene plastic.
- D. PVC: Polyvinyl chloride plastic.
- E. SRCP: Reinforced Concrete Pipe (sealant joints)

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: Pipe joints shall be at least silt-tight, unless otherwise indicated.

#### 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Channel drainage systems.
- B. Shop Drawings: Include plans, elevations, sections, details, and frames and covers for the following:
  - 1. Drainage structures.

- C. Field quality-control test reports.

## 1.6 QUALITY ASSURANCE

- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.

- 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

- a. For locations within areas of DOT jurisdiction, perform all work, testing, and inspections in accordance with applicable DOT standards and procedures.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic materials in direct sunlight. Support to prevent sagging and bending.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes, drainage structures and pipe culverts according to manufacturer's written rigging instructions.

## 1.8 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

- 1. Notify Architect no fewer than two days in advance of proposed interruption of service.
- 2. Do not proceed with interruption of service without Architect's written permission.

## PART 2 - PRODUCTS

### 2.1 POLYVINYL CHLORIDE PLASTIC PIPE AND FITTINGS (PVC)

- A. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 26, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

- 1. Finished joint system shall meet the requirements of ASTM D 3212.

### 2.2 CONCRETE PIPE

- A. Reinforced-Concrete Sewer Pipe: AASHTO M 170 (ASTM C 76), with bell-and-spigot or groove and tongue ends.

- 1. Class III, Wall B.
- 2. Joints shall be as follows:

- a. Where indicated as SRCP on Drawings: sealant joints with AASHTO M 198 (ASTM C 990), bitumen or butyl-rubber sealant.
3. For locations within NCDOT jurisdiction, only use products from manufacturer's that are included on NCDOT's approved list.

## 2.3 GEOTEXTILES

- A. Pipe Joint Wrap Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
  1. Width: Min. 18" or sufficient to extend beyond the joint and base of pipe bell at least 6 inches on each side.
  2. Length: One continuous piece of sufficient length to extend around the entire pipe circumference with a 12" overlap.
  3. Type 1 as defined in Table 1056-1, Section 1056 of NCDOT Standard Specs.
  4. Grab Tensile Strength: 90 lbf; ASTM D 4632.
  5. Puncture Strength: 60 lbf; ASTM D 4833.
  6. Trapezoidal Tear: 40 lbf; ASTM D-4533
  7. Apparent Opening Size: No. 70 sieve, maximum; ASTM D 4751.
  8. Permittivity: 2.2 second-1, minimum; ASTM D 4491.
  9. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355.
  10. Water Flow Rate: 150 gal/min/ft<sup>2</sup>; ASTM D-4491

## 2.4 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and stainless steel tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  1. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded Flexible Couplings: Elastomeric sleeve with stainless steel shear ring and stainless steel-metal tension band and tightening mechanism on each end.
  1. Manufacturers:
    - a. Dallas Specialty & Mfg. Co.
    - b. Fernco Inc.
    - c. Logan Clay Products Company (The).
    - d. Mission Rubber Company; a division of MCP Industries, Inc.
    - e. NDS Inc.
    - f. Plastic Oddities, Inc.
- D. Ring-Type Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.
  1. Manufacturers:

- a. Fernco Inc.
- b. Logan Clay Products Company (The).
- c. Mission Rubber Company; a division of MCP Industries, Inc.

## 2.5 CONCRETE

- A. General: A Class Portland Cement Concrete in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- B. Portland Cement Design Mix: 3000 psi minimum, with 0.488 maximum water-cementitious materials ratio.
  1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

## 2.6 POLYMER-CONCRETE, CHANNEL DRAINAGE SYSTEMS

- A. Description, General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total lengths indicated.
- B. Manufacturers:
  1. ABT, Inc.
  2. ACO Polymer Products, Inc.
  3. Innovative Plastics Products, Inc.
  4. Mea-Josam Div.; Josam Company.
  5. Strongwell; Lenoir City Div.
- C. Sloped-Invert, Polymer-Concrete Systems: Include the following components:
  1. Channel Sections: Interlocking-joint, precast, modular units with end caps. Include 4-inch inside width and deep, rounded bottom, with built-in invert slope of 0.6 percent and with outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.
    - a. Frame: Include gray-iron or steel frame for grate.
  2. Grates with manufacturer's designation "Heavy Duty," with slots or perforations that fit recesses in channels.
    - a. Material: Gray iron.
  3. Covers: Solid gray iron, if indicated.
  4. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.
- D. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
- E. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

## 2.7 PLASTIC, CHANNEL DRAINAGE SYSTEMS

- A. Description, General: Modular system of plastic channel sections, grates, and appurtenances; designed so grates fit into frames without rocking or rattling. Include number of units required to form total lengths indicated.
- B. Manufacturers:
1. ACO Polymer Prod.
  2. MultiDrain Corp.
  3. NDS Inc.
  4. Tuf-Tite, Inc.
  5. Zurn Industries, Inc.; Zurn Light Commercial Specialty Plumbing Products.
- C. PE Systems: Include the following components:
1. Channel Sections: Interlocking-joint, PE modular units, 4 inches wide, with end caps. Include rounded bottom, with level invert and with outlets in number, sizes, and locations indicated.
  2. Grates: PE, ladder shaped; with stainless-steel screws.
  3. Color: Gray, unless otherwise indicated.
  4. Drainage Specialties: Include the following PE components:
    - a. Drains: 4-inch square, slotted top; with NPS 3 bottom outlet.
    - b. Catch Basins: 12-inch square plastic body, with outlets in number and sizes indicated. Include PE slotted grate 11-3/4 inches square by 1-1/8 inches thick.
- D. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
- E. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

## 2.8 CONCRETE DRAINAGE STRUCTURES

- A. Drainage Structure Boxes: Precast reinforced concrete in accordance with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Design: ASTM C 913, designed according to ASTM C 890 for A-16 (ASSHTO HS20-44), heavy-traffic, structural loading.
  2. Configuration: as indicated on North Carolina Department of Transportation Standard Drawing #'s 840.45 or 840.46 as applicable for traffic loading.
  3. Depth and Size: as indicated on Drawings.
  4. Pipe Openings: as required for pipe size and location.
    - a. Must be integral to design and provided at time of original casting.
    - b. Where possible, orient structure so pipes enter through walls. Pipes may enter through corners provided a minimum of 6" wall space is provided to top and other openings.
  5. Risers: Precast reinforced concrete as indicated on North Carolina Department of Transportation Standard Drawing 840.45 or 840.46 as applicable for traffic loading..
  6. Steps: per NCDOT Standard Detail #840.66, Individual ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, Polypropylene plastic wide enough to allow worker to place both feet on 1 step and designed to prevent lateral

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- slippage off of step. Cast or anchor steps into sidewalls at 12 inch intervals. Omit steps if total depth from floor of box to finished grade is less than 54 inches.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
  8. Mortar and Grout: Comply with ASTM C 270, Type M or S.
- B. Catch Basins (CB): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Transitional Top Slabs (where required): At a minimum, as indicated on North Carolina Department of Transportation Standard Drawing #'s 840.02 and 840.03 with additional reinforcing as required for opening.
  2. Frames and Grates: as indicated on Drawings or as required by agency having authority.
    - a. Covers for use in areas of NCDOT jurisdiction shall be per NCDOT Standard Detail #840.03.
    - b. Cast Iron: conforming to AASHTO M 105, Class 35B.
    - c. All finished frames and grates shall conform to the alternate load test of AASHTO M 306.
- C. Junction Boxes (JB): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Top Slabs: At a minimum, as indicated on North Carolina Department of Transportation Standard Drawing 840.31 with additional reinforcing as required for opening.
  2. Frames and Covers: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange and 26-inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "STORM SEWER" shall be cast.
    - a. Covers for use in areas of NCDOT jurisdiction shall be per NCDOT Standard Detail #840.54.
    - b. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - c. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise noted.
- D. Open Throat Catch Basins (CB-OT): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Top Slabs and Throats: As indicated on Drawings and conforming to North Carolina Department of Transportation Standard Drawing #840.04 as applicable.
  2. Throat Transitions to Curb: Cast-in-place concrete, hand formed to provide smooth transition to adjoining curb. Finish to match adjoining curb.
  3. Frames and Covers (if indicated): Ferrous; 24 inch ID. Frame designed to be embedded in concrete with top flush to concrete surface. 2-1/2 inch minimum width flange and 24 inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "STORM SEWER" shall be cast.
    - a. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise noted.

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- E. Drop Inlets (DI): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Transitional Top Slabs: At a minimum, as indicated on North Carolina Department of Transportation Standard Drawing #840.14 with additional reinforcing as required for opening.
  2. Frames and Grates: as indicated on Drawings or as required by agency having authority.
    - a. Frame and Grates for use in areas of NCDOT jurisdiction shall be per NCDOT Standard Detail #840.16.
    - b. Cast Iron: conforming to AASHTO M 105, Class 35B.
    - c. Steel Tubing: conforming to ASTM A 53, Schedule 80.
    - d. All finished frames and grates shall conform to the alternate load test of AASHTO M 306.
- F. Slab Type Catch Basins (CB-ST): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Top Slabs: At a minimum, as indicated on North Carolina Department of Transportation Standard Drawing 840.04 with additional reinforcing as required for opening.
  2. Frames and Covers (if indicated): Ferrous; 24 inch ID. Frame designed to be embedded in concrete with top flush to concrete surface. 2-1/2 inch minimum width flange and 24 inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "STORM SEWER" shall be cast.
    - a. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise noted.
- G. Pond Outlet Control Structures (OCS): Conforming with applicable portions of Sections 840 and 1077 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
1. Top Slabs: At a minimum, as indicated on North Carolina Department of Transportation Standard Drawing 840.04 with additional reinforcing as required for opening.
  2. Frames and Covers (where indicated): Ferrous; 24 inch ID. Frame designed to be embedded in concrete with top flush to concrete surface. 2-1/2 inch minimum width flange and 24 inch diameter cover. Include indented top design with lettering cast into cover, using wording or design required by agency having authority. Where no specific wording or design is required by agency, wording equivalent to "STORM SEWER" shall be cast.
    - a. Material: ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    - b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 10-mil minimum thickness applied to all surfaces, unless otherwise noted.
  3. Frames and Grates (where indicated): as indicated on Drawings or as required by agency having authority.
    - a. Cast Iron: conforming to AASHTO M 105, Class 35B.
    - b. Steel Tubing: conforming to ASTM A 53, Schedule 80.
    - c. Plastic: HDPE

4. Fastenings: Stainless steel, as recommended by manufacturer.

## 2.9 PVC DRAINAGE STRUCTURES (Yard Inlets – YI)

- A. Drain Basins: Nyloplast type or approved equal, manufactured from PVC pipe stock meeting the requirements of ASTM D 3034. Fabrication shall utilize a thermo-molding process to reform the pipe stock to the required configuration. The pipe connection stubs shall be manufactured from PVC pipe stock and formed to provide a watertight connection with the indicated pipe material. Finished joint system shall meet the requirements of ASTM D 3212.

1. Grates: Configuration as indicated. Ductile Iron meeting the requirements or ASTM A 536, Grade 70-50-05.

- a. Furnished by the same manufacturer as part of an integral system.
- b. Shall be capable of supporting ASSHTO H-25 loading.
- c. Protective Coating: Foundry-applied black paint.

2. Manufacturers:

- a. Advanced Drainage Systems, Inc.
- b. Hancor, Inc.

- B. Inline Drains: Nyloplast type or approved equal, manufactured from PVC pipe stock meeting the requirements of ASTM D 3034. Fabrication shall utilize a thermo-molding process to reform the pipe stock to the required configuration. The pipe connection stubs shall be manufactured from PVC pipe stock and formed to provide a watertight connection with the indicated pipe material. Finished joint system shall meet the requirements of ASTM D 3212.

1. Grates: Ductile Iron meeting the requirements or ASTM A 536, Grade 70-50-05.

- a. Furnished by the same manufacturer as part of an integral system.
- b. Shall be capable of supporting ASSHTO H-25 loading.
- c. Protective Coating: Foundry-applied black paint.

2. Manufacturers:

- a. Advanced Drainage Systems, Inc.
- b. Hancor, Inc.

## 2.10 PIPE INLETS AND OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.

- B. Beveled Pipe Ends (BPE)

1. Manufactured, flared and beveled pipe end sections. Made of the same material and by the same manufacturer as standard pipe sections.

- a. Specifically manufactured for use to provide smooth slope transitions at beginning and end of pipe runs.
- b. Field cut tapered ends, made by cutting end of a standard pipe section at an angle will not be accepted.

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- C. Riprap: Broken, irregular size and shape, graded stone conforming to Section 1042 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
    - 1. Gradation: Class B.
  - D. Turf Reinforcement Mat: Three dimensional, woven, highly UV resistant, polypropylene geotextile specifically designed for erosion control applications on steep slope and high velocity, vegetated waterway applications. Conforming to FHWA FP-03, Section 713.18. Include manufacturer's recommended installation anchor materials.
    - 1. Manufacturers:
      - a. Propex Geosynthetics: (Pyramat)
      - b. North American Green: (P550)
      - c. American Excelsior Co.: (Recyclex)

### PART 3 - EXECUTION

#### 3.1 NCDOT JURISDICTION

- A. For drainage culverts and structures located within areas of NCDOT jurisdiction, installation shall be in accordance with applicable portions of Sections 300, 414, 840, 858 and 859 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

#### 3.2 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section titled "Earth Moving."
- B. Protect and maintain erosion and sedimentation controls, which are specified in Section titled "Site Clearing," during earthwork operations.

#### 3.3 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes or drainage structures for changes in direction unless fittings are indicated. Use manholes or drainage structures for branch connections unless direct connection into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

- E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.
- F. Install gravity-flow, nonpressure drainage piping according to the following as applicable:
  - 1. Install piping pitched down in direction of flow, at minimum slope of 0.20 percent, unless otherwise indicated.
  - 2. Install piping below frost line.
  - 3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
  - 4. Install reinforced-concrete sewer piping, elliptical concrete pipe, and concrete box culverts according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

### 3.4 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following as applicable:
  - 1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
  - 2. Join reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasket, bitumen, or butyl-rubber sealant joints as applicable.
  - 3. Join dissimilar pipe materials with nonpressure-type flexible couplings.
- B. Wrap pipe joints with pipe joint wrap geotextile at least 18 inches in width. For larger pipe diameters where an 18 inch width is insufficient to completely cover the pipe bell, use a width sufficient to cover and extend beyond the bell at least 6 inches.

### 3.5 CONCRETE DRAINAGE STRUCTURE INSTALLATION

- A. General: Install drainage structures, complete with appurtenances and accessories indicated.
- B. Install precast concrete drainage structure sections according to ASTM C 891.
  - 1. For drainage structures located within areas of NCDOT jurisdiction, installation shall be in accordance with applicable portions of Section 840, of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.
- C. Set tops, frames, grates and covers to elevations indicated.
- D. Fabricate inlet throats to shape and elevations indicated.
- E. Seal and grout all opening around pipe penetrations watertight.

### 3.6 PVC DRAINAGE STRUCTURE INSTALLATION

- A. Install manufactured, PVC drainage structures, complete with appurtenances and accessories indicated, according to manufacturer's written instructions and the following:
  - 1. Install PVC drainage structures according to ASTM D 2321 and ASTM F 1668.
  - 2. Join piping to structure according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
  - 3. Finished joint system shall meet the requirements of ASTM D 3212.

- B. Set frames, grates and covers to elevations indicated.

### 3.7 PIPE INLET AND OUTLET INSTALLATION

- A. Construct inlet and outlet head walls, aprons, and sides of reinforced concrete, as indicated.
  - 1. Comply with the requirements of Sections 300, 420, 838 and 840 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures as applicable for measuring, mixing, transporting, and placing concrete.
- B. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
- C. Construct riprap of broken stone, as indicated.
- D. Install turf reinforcement mat as indicated and in accordance with manufacturer's written instructions.

### 3.8 CONCRETE PLACEMENT

- 1. Install reinforcing and cast-in-place concrete in accordance with applicable requirements of Sections 420, 425, 838 and 840 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

### 3.9 CHANNEL DRAINAGE SYSTEM INSTALLATION

- A. Assemble and install components according to manufacturer's written instructions.
- B. Install with top surfaces of components, except piping, flush with finished surface.
- C. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- D. Embed channel sections and drainage specialties in 4 inch minimum concrete around bottom and sides.
- E. Fasten grates to channel sections if indicated.

### 3.10 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
  - 1. Submit separate reports for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 95 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.

- e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Reinspect and repeat procedure until results are satisfactory.
  - B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
    - 1. Do not enclose, cover, or put into service before inspection and approval.
    - 2. Test completed piping systems according to authorities having jurisdiction.
    - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
    - 4. Submit separate report for each test.
  - C. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
  - D. Video Documentation: Upon completion and prior to final inspection, complete a videotaped documentation of the completed piping system, along its interior length, utilizing equipment made expressly for the purpose. Provide a written report, inspection logs, and a copy of the inspection videotape to the Architect.
- 3.11 CLEANING
- A. Clean interior of piping of dirt and superfluous materials. Collect flushed materials in sediment trapping devices: do not flush into downstream drainage systems or receiving waterbodies.

END OF SECTION 334100

## SECTION 334600 – SUBDRAINAGE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes subdrainage (underdrain) systems for the following:
  - 1. Pavement subgrades.
  - 2. Retaining walls.
  - 3. Landscaped areas.

#### 1.3 DEFINITIONS

- A. PE: Polyethylene plastic.
- B. PVC: Polyvinyl chloride plastic.
- C. Subdrainage: Drainage system that collects and removes subsurface or seepage water.

#### 1.4 QUALITY ASSURANCE

- A. Authorities Having Jurisdiction: Conform to requirements of all authorities having jurisdiction.
  - 1. Where conflicts exist between the requirements of the Contract Documents and those of authorities having jurisdiction, the higher quality or more restrictive requirement shall apply.

### PART 2 - PRODUCTS

#### 2.1 PERFORATED-WALL PIPES AND FITTINGS

- A. Perforated PE Pipe and Fittings:
  - 1. NPS 6 and Smaller: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.
  - 2. Couplings: Manufacturer's standard, band type.

## 2.2 SOLID-WALL PIPES AND FITTINGS

- A. PE Drainage Tubing and Fittings: AASHTO M 252, Type S, corrugated, with smooth waterway, for coupled joints.
  - 1. Couplings: AASHTO M 252, corrugated, band type, matching tubing and fittings.

## 2.3 PIPE TO DRAINAGE STRUCTURE CONNECTORS

- A. Resilient Pipe Connectors: ASTM C 923, cast into manhole wall at time of manufacture or fitted into walls in the field, for each pipe connection.
  - 1. Fittings shall be specifically designed for integral casting or field installation as applicable.

## 2.4 AGGREGATE MATERIALS

- A. Filter Aggregate: specified in Section titled "Earth Moving."

## 2.5 SOIL MATERIALS

- A. Backfill: Satisfactory Soil specified in Section titled "Earth Moving."

## 2.6 GEOTEXTILES

- A. Subsurface Drainage Geotextile specified in Section titled "Earth Moving."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.
- B. Locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section titled "Earth Moving."

### 3.3 PIPING APPLICATIONS

- A. Subdrainage Piping:

1. Perforated PE pipe and fittings, couplings, and coupled joints.

B. Header Piping:

1. PE drainage pipe or tubing, as applicable, and fittings, couplings, and coupled joints.

3.4 PEFORATED PIPE SUBDRAINAGE INSTALLATION

- A. For locations within areas of DOT jurisdiction, perform all work, testing, and inspections in accordance with applicable DOT details, standards and procedures.
- B. Provide trench width as indicated or, where not indicated, of sufficient width for subdrainage pipe and required distance between pipe and trench walls. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.
- C. Line trench with geotextile. Roll of geotextile shall be extended longitudinally along the trench in order to minimize joints. Roll width shall be sufficient to cover bottom, sides, and top of trench, with at a 6 inch overlap, without joints. Where a joint is required for a new roll of geotextile, overlap 6 inches.
- D. Place supporting layer of filter aggregate over compacted subgrade to compacted depth of not less than 4 inches.
- E. Install subdrainage pipe as indicated in Part 3 "Piping Installation" Article for basic subdrainage with horizontal distance as indicated on drawings or, where not indicated, of at least 9 inches between pipe and trench walls.
- F. Add filter aggregate to top of subdrainage pipe.
- G. After satisfactory testing, cover subdrainage pipe with filter aggregate to compacted depth indicated or, where not indicated, to within 12 inches of finish grade.
- H. Place filter aggregate in layers not exceeding 3 inches in loose depth; compact each layer as placed.
- I. Fold sides of geotextile fabric over top of filter aggregate, overlapping longitudinal edges a distance of 6 inches.
- J. Fill to Grade: Place satisfactory soil fill material over filter fabric. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Fill to finish grade.

3.5 RETAINING-WALL SUBDRAINAGE INSTALLATION (PERFORATED PIPE TYPE)

- A. Place supporting layer of filter aggregate over compacted subgrade to compacted depth of not less than 4 inches. Place against wall to a width sufficient for subdrainage pipe and required distance between pipe and outside edge of filter aggregate.
- B. Install subdrainage pipe as indicated on drawings and in Part 3 "Piping Installation" Article for retaining-wall subdrainage.
- C. Add filter aggregate to width indicated on drawings or, where not indicated, of sufficient width to provide at least 9 inches between outside wall of pipe and outside edge of filter aggregate. Fill to a level 9 inches above top of pipe to perform tests.

- D. After satisfactory testing, place additional filter aggregate against wall to width of at least 12 inches to within 12 inches of finish grade.
- E. Place filter aggregate in layers not exceeding 3 inches in loose depth; compact each layer as placed.
- F. Place layer of flat-style geotextile filter fabric, of sufficient width to cover filter aggregate surface, over top of filter aggregate. Where required, overlap longitudinal edges at least 4 inches.
- G. Fill to Grade: Place satisfactory soil fill material over filter fabric. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Fill to finish grade.

### 3.6 RETAINING-WALL SUBDRAINAGE INSTALLATION (WEEP HOLE TYPE)

- A. Provide weep holes in retaining wall as indicated on drawings. Where not indicated, bottom of weep holes shall be located 1 inch above finished grade on exposed face of wall, shall be located at intervals not to exceed 6 feet, and shall be between 3/8 and 1 inch in diameter. For masonry walls, weep holes provide by voids in mortar shall be 3/8 inch wide and one course high.
- B. Place filter aggregate over compacted subgrade against wall to width of at least 12 inches to a level 12 inches above top of weep holes to perform tests.
- C. After satisfactory testing, place additional filter aggregate against wall to width of at least 12 inches to within 12 inches of finish grade.
- D. Place filter aggregate in layers not exceeding 3 inches in loose depth; compact each layer as placed.
- E. Place layer of flat-style geotextile filter fabric, of sufficient width to cover filter aggregate surface, over top of filter aggregate. Where required, overlap longitudinal edges at least 4 inches.
- F. Fill to Grade: Place satisfactory soil fill material over filter fabric. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Fill to finish grade.

### 3.7 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering aggregate. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
  - 1. Perforated Pipe Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches, unless otherwise indicated.
  - 2. Retaining-Wall Subdrainage (Perforated Pipe Type): When water discharges at end of wall into stormwater piping system, install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches, unless otherwise indicated. However, when water discharges through wall at regular intervals, pipe may be installed with a minimum slope of zero percent.
  - 3. Lay perforated pipe with perforations down.

- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install PE piping according to ASTM D 2321.

### 3.8 PIPE JOINT CONSTRUCTION

- A. Join perforated, PE pipe and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties"; or according to ASTM D 2321.
- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

### 3.9 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect low elevations of subdrainage system to solid-wall-piping storm drainage system at concrete drainage structures as follows:
  - 1. Where resilient connector is not installed at time of drainage structure manufacture,
    - a. Core drill opening into structure large enough to allow installation of resilient manhole connector.
    - b. Install resilient manhole connector in accordance with manufacturer's written instructions.
  - 2. Install pipe in resilient connector in accordance with manufacturer's written instructions.
  - 3. Cut end of connection pipe passing through structure wall to be flush with inside wall, unless otherwise indicated.
  - 4. On inside of structure wall, encase outside of pipe to flush with face of wall with grout.
  - 5. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  - 6. Protect piping and structures to prevent concrete or debris from entering while making connections. Remove debris or other extraneous material that may accumulate.

### 3.10 FIELD QUALITY CONTROL

- A. Inspection: Before placing drainage course around and above pipe, inspect pipe to confirm that: it is not crushed or damaged; that joints are sound and properly made; that interior of pipe is unobstructed and free flowing; that pipe is properly aligned and at indicated elevation and grade; and that connections to drainage structures are properly made, sound, and water-tight. As drainage course and backfill is installed, monitor operations to ensure that pipe is not damaged or displaced by placement or compaction operations.

3.11 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600

## Attachment: RFIs and answers for Addendum 3

### Notes to all Bidders:

- Not all questions have been answered. You are encouraged to look for the answers in the drawings sets and project specifications
- Addendum 3 should cover all door hardware related unanswered questions from Addendum 1 and Addendum 2

**RFI 1:** Please identify door type DD. As seen on page A-602 Door Schedule

**Answer:** See revised sheet A-602

**RFI 2:** None of the Civil drawings or enlarged detail on C7.4 show concrete under the bleachers by the track. Enlarged plan A-420 shows concrete under the bleachers. We had concrete under the bleachers at Belmont. Please note that concrete should be under the bleachers on the Civil drawings.

**Answer:** Yes, add concrete pad underneath the bleachers. See revised civil drawings

**RFI 3:** Parapet coping is showing steel angle all around the building. Is this the intent?

**Answer:** We would like to eliminate steel angle at parapet coping detail. See revise sheet A-510

**RFI 4:** In looking at the new sewer line that reroutes the sewer from the existing school building through the current baseball field – this new line is above the existing grade. This line must be installed before grading on the football field can commence. Can these lines be lowered to allow for installation ASAP to allow grading to commence?

**Answer:** The new sewer line has been lowered below existing grade to allow for installation as soon as possible. Temporary grading shown in erosion control plans has been adjusted accordingly.

**RFI 5:** Plumber asks if Sch 40 PVC will be acceptable underground to 1' above slab for Sanitary Sewer (not Grease waste). That was what was used on Belmont Middle School.

**Answer:** Yes, that is acceptable.

**RFI 6:** Have you identified what model or type of Paxton Proximity Door Readers you would like to use on this project? Can not find any model specified or listed on the Door schedules or any other drawings.

**Answer:** Card readers shall be "Multiclass & OSDP".

**RFI 7:** Edison Foard fence questions

A. What is the athletic running track surface:

**Answer:** Install an impermeable polyurethane synthetic track system comprised of a base layer of polyurethane bound SBR rubber granules, BEYPUR 200, an impermeable layer (seal coat) of a two-component urethane, and topped with BEYPUR, a spray-applied coating of single-component polyurethane, and EPDM granules.

B. Can you provide paint layout?

**Answer:** Layout and paint all track lines and event markings as required and specified by current IAAF and NCAA rules.

**RFI 8:** New Atlantic questions about spec section 012300 – Alternates

1. The description of Alternate 1 (par. 3.1-A for Baseball and Softball Fields) states "Base Bid: Provide grass field with conduit only ..." and "Alternate: Provide field lights at Baseball and Softball fields ...",

**Answer:** Base bid: grass filed, conduit only; Alternate: wiring, light poles, lighting

2. The description of Alternate 2 (par. 3.1-B for the Football Field) states “Base Bid: Provide grass field with conduit only ...” and “Alternate: Provide field lights at Football field ...”

**Answer: Base bid: grass filed, conduit only; Alternate: wiring, light poles, lighting**

3. Question: Is it your intent that, for the Base Bid, those three athletic field are to be fully constructed (with earthwork, storm drainage, turf, infield mixes, fencing, backstops, dugouts, athletic equipment, concrete walkways, bleachers and grandstands, comfort station buildings, etc. -- basically all entities shown on the drawings) with the exception of sports field lighting (wiring, controls, poles, lighting fixtures, and lighting bulbs)?

**Answer: Correct! Only alternate is field lighting**

**RFI 9:** Beam’s acoustic ceiling and wall acoustic panel questions

1. Finish schedule on sheet A-712 calls for ACT-1, ACT2, ACT3 & ACT4 to be a square edge tile. The room finish schedule on sheet A/713 calls for tegular tile in these areas: 001C Corridor, 100 Vestibule & Corridor, 105C Corridor, 110C Corridor, 120C Corridor, 297 Corridor, 298 Corridor, 100A Lobby, B001 Vestibule, D100 Cafeteria, G002 Vestibule, G003 Lobby, G004 Corridor just making sure the architect wants tegular acoustic tiles in these areas and square edge acoustic tile in all other areas. Please confirm tegular tile is desired in the areas noted.

**Answer; All ACT to be square edge.**

2. The Room Finish Schedule on A-713 calls for ACT-1 & ACT-4 in D100 Cafeteria. Reflective Ceiling Plans show ACT- 4 & ACT-2 can you have the architect clarify which material is correct. Please clarify.

**Answer: ACT -1 and ACT-4. See revision in Addendum 3.**

3. Interior elevations (A-700 to A-710) show AWP-1/AWP-2/AWP-3/AWP-4/AWP-2B and the finish schedule (A-712) shows AWP-1/AWP-1A/AWP-1B. Can you provide what AWP-2/AWP-3/AWP-4/AWP-2B are to be as these are not shown on the finish schedule?

**Answer: See revision in Addendum 3.**

**RFI 10:** On Drawing A-101A and Enlarged Plan B1/A-415 in Professional Library M105, there appear to be bookshelf units along the East and West walls, but these units are identified by a unit reference number. Are they to be F60.2 / WS1 / 36x84x12 units similar to the Media Center M100 units (South wall) just outside this room? If not, please provide the appropriate unit identification number for these units.

**Answer: These are B35 36”x42”x12”.**

**RFI 11:** New Atlantic’s questions regarding Plumbing systems

1. Lab Connection Note 2 on Drawing P-001 itemizes the Plumber’s responsibilities regarding the various types of Lab piping (air, vacuum, acid waste/vent, compresses air, and various Lab gasses, etc.) and we are directed to “Lab Equipment Drawings” for additional requirements. However, there are no Lab Equipment Drawings (other than Lab Casework Drawing A-407, which provides no additional requirements or details). Please provide additional drawings or information providing specific requirements for lab-related plumbing work.

**Answer: Please disregard note #2. There is not any lab gas piping for this project.**

2. Drawing P-001, P-002, and Details 7/P-602 and 8/P-602 state that acid waste piping must be installed between the lab sink outlets and the neutralization trap using fire-retardant Schedule 40 polypropylene piping and fittings. Specification 220503 (paragraphs 2.2 and 2.3) also tell us what material is to be used for the acid waste system. Is there a certain distance beyond the neutralization trap before we can change from acid piping to sanitary waste piping? Can we change piping types at the neutralization trap outlets?

**Answer: Acid waste piping is only required between the sink and the acid neutralization tank. Piping downstream of the neutralization tank can be standard sanitary drainage piping.**

3. The Plumbing Specialties Schedule on Drawing P-002 and Detail 6/P-602 indicate HB-4 Roof Hose Bibbs, but there are none shown anywhere on the other Plumbing Drawings. Please advise as to whether any are required for the project and, if so, identify the locations.

**Answer: Please disregard HB-4 specification. The roof mounted hose bibb was replaced by a wall type hose bibb nearby.**

4. Key Note 11 for the Kitchen D108 hand sinks calls for thermostatic mixing valves MV2, but the Drawing P-002 Specialties Schedule does not include these MV2 mixing valves. Please advise as to what these MV2's are to be.

**Answer: This is a typo, the mixing valve reference should be for MV1 which is AMERICAN STANDARD 605XTMV1070, NSF 61 CERTIFIED, WITH INTEGRAL CHECK VALVES AND SCREENS ON INLETS.**

5. There are several notes within the Plumbing Drawings referring to NG (natural gas) hook-ups for the Mechanical equipment. Please clarify whether the Plumbing contractor or the Mechanical contractor is responsible for providing the NG Regulators at these mechanical equipment hook-ups.

**Answer: Response: The mechanical contractor is responsible for connections to the HVAC equipment. Plumbing contractor is responsible for all other final connections including the emergency generator and gas laundry dryer.**

**RFI 12:** New Atlantic's questions regarding the Electrical system, as follows:

1. The Electrical Drawings and Specifications require copper electrical power service feeders. Can aluminum service feeders be used (for 100 amp and larger feeders) in lieu of copper in this project?

**Answer: Aluminum is not approved for this project.**

2. Will MC cable be allowable for use above concealed ceilings and within metal stud-framed walls in this project?

**Answer: 6' fixture whips only.**

**RFI 13:** Edison Foard's site questions

1. Please send us the 2<sup>nd</sup> geotechnical report, dated January 11, 2022, that is referenced in specification section 312000.

**Answer: Spec included in Addendum 3**

**RFI 14:** New Atlantic's acoustic panels questions

1. Numerous Interior Elevations refer to Acoustical Wall Panels as "AWP2", "AWP-3", and "AWP4", but the Division 11 Equipment Schedule on Finish Legend Drawing A-712 lists "AWP-1", "AWP-1A", and "AWP-1B". Please clarify which elevation numbers (AWP2, 3, and 4) match the finish legend numbers (AWP1, 1A, and 1B).

**Answer: Addressed in addendum 3 on finish legend.**

2. The Enlarged RCP Plan A1/A-412 at Chorus A105 and Band A106 indicate 4' x 4' ACT-6 (convex ceiling diffusers), but the Finish Legend on Drawing A-712 refers to these Convex Diffuser Panels as "APC-44". Please confirm that these "ACT-6" and "APC-44" products are the same items.

**Answer: Yes, those are the same products.**

**RFI 15:** The finish legend sheet A712 calls for Acoustic Metal Panels in Gym Need location nothing shows the location of the Metal wall panels. Also Acoustical Wrapped Panels states in Dining / Music / Band / Fitness / Gym need location for where these are to go as well.

I have checked the building sections /the Finish plan and the Finish schedule nothing is showing the location / of these panels. Please advise or send updated plans.

Answer: The metal wall panel locations for the gym are located on A-709 and A-710. The Acoustical wrapped panel are located on the interior elevation and finish legend sheets. The new sheets for addenda 3 have updated tags for acoustical wrapped panels.

**RFI 16:** Will it be acceptable to use pro-press copper fittings for 2-1/2" to 4" copper pipe inside the building?

**Answer: Yes, Pro-press fitting are acceptable.**

**RFI 17:** Beam's questions

1. A522 – calls for stainless steel top rail on a regular steel guard rail. These are dissimilar materials and will need to be made with a mechanical bracket – they cannot be welded together for a smooth transition. Please confirm a mechanical bracket is acceptable.

**Answer: Lobby A100A is terrazzo with a terrazzo tread and Corridor 001C is rubber, same as the other stairs.**

2. A101-C Outdoor Art Classroom 63 – there is a "Stamped Concrete" note on this area – this is not called out anywhere else. Is this stamped concrete or just a concrete pad?

**Answer: no stamped concrete in this project**

**RFI 18:** Cleveland's site questions

1. Specification 31200 Earthwork section 3.16 D.1 states to Compact soil materials to not less than the following percentages of maximum dry density according to ASTM D 698: Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill soil material at 100 percent. To what depth is this required? Typically it's the top foot or 18" that need to be 100%.

**Answer: The compaction spec referenced in 3.16 refers to placed fill materials (not undisturbed in-situ soil) and it is intended that all fill material is placed and compacted in 8" maximum lifts with each lift compacted to the specified level.**

**See Table below from Geotech report dated 11/4/21 regarding compaction requirements:**

STRUCTURAL FILL INDEX PROPERTIES	
Subject	Property
Building and Pavement Areas	LL < 50, PI < 30
Maximum Particle Size	4 inches
Maximum Organic Content	5% by dry weight
Minimum Dry Unit Weight (ASTM D698)	90 pounds per cubic foot

STRUCTURAL FILL COMPACTION REQUIREMENTS	
Subject	Requirement
Compaction Standard	Standard Proctor, ASTM D698
Required Compaction (greater than 24 inches below finished soil subgrade)	95% of Maximum Dry Density
Required Compaction (within 24 inches of finished soil subgrade)	100% of Maximum Dry Density
Moisture Content	-3 to +3 % points of the soil's optimum value
Loose Thickness (maximum)*	8 inches prior to compaction

\*Note: Thinner loose lifts may be necessary depending on the compaction equipment utilized.

Specification 31200 Earthwork section 3.17 B states to finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch. 2. Walks and Pavements: Plus or minus 1/2 inch. Could these be adjusted to the Industry standard of +/- .10'?

**Answer: Lawn or unpaved areas can be plus or minus 0.10'. Walks and Pavements in paved areas can be plus or minus 0.10' except for ADA walks and paths to be plus or minus 1/2". Specs have been updated to address this for all bidders.**

**RFI 19:** Beam's questions

1. Concrete Paving
  - a. Spec 321312-2, section 2.3.A.1 & 2.8.B.1 calls for 3,500psi
  - b. Spec 321400-2, section 2.2.A calls for 4,500psi
  - c. Please clarify which is correct

**Answer: to be clarified later**

2. C3.0, the fence around the existing BMP on the Schiele property calls to be removed. The Site plan does not show it being replaced,
  - a. Please clarify if the fence is to be reinstalled.

**Answer: Assume fence is not reinstalled.**
3. C3.2

- a. The north end of the Schiele parking lot (just west of the relocated BMP), shows added parking, curb, and also what appears to be a retaining wall, but there is no BW or TW elevations called out.

**Answer: Only Schiele museum improvements that should be incorporated into this bid set is the proposed driveway connection between Schiele and Grier as well as the relocation of the existing BMP and any associated infrastructure updates for the BMP relocation. Additional full Schiele improvements will be shown in a separate CD Package.**

- i. Please clarify what the intent is and also the following:

- 1. What is the extent of the paving to be replaced?
- 2. Is vehicular guard rail to be provided due to the height of this wall?
- 3. This is in the stream buffer, there is no erosion control shown?
- 4. Provide BW & TW elevations

- b. The entrance of the Schiele from Garrison appears to be reworked and widened in this phase including a new walk beside their sign. Is this work a part of the Grier project since it is located on property not owned by Gaston County Schools?

**Answer: Scope by Garrison Blvd. to be included with separate set of CD's. Sidewalk connection and stairs from Schiele site to Grier site is included in this scope.**

- i. Please clarify what the intent is and also the following:

- 1. What is the extent of the paving to be replaced?
- 2. How much sidewalk is to be replaced against the building?
- 3. How much of the striping is to be redone?
- 4. What happens with the existing bollard lights?
- 5. What happens to the existing timber retaining wall that the drive widening will encroach on?
- 6. Is the pedestrian cross walk striping to be provided?
- 7. In this same location where the sidewalk is shown to connect from the GMS property to the Schiele property, there is currently a timber retaining wall here that is not shown to be removed, nor is any grading shown to be done in this area.



- a. 1/C7.3

- a. Notes 2 & 3 refer to "add alternates 1 & 2" for synthetic turf on the baseball field. These alternates are not listed in spec section 012300

- i. Please clarify the intent.

**Answer: We are coordinating to send synthetic turf spec.**

- 5. 2/C7.2

- a. There is still a note that says "Track Surfacing see detail 4". I think this was supposed to be removed in add. 2 according to note J listed under Addendum 2 on sheet C1.1 that was reissued in add. 2.

- i. Please clarify.

**Answer: Detail 2/C7.2 has been updated.**

- 6. Division 31, 32, & 33 in the spec's all have the incorrect project name at the top of the page ("TRANSPORTATION & MAINTENANCE BUILDING RUTHERFORD CO. SCHOOLS")

- a. Please advise if these spec's still pertain to this project.

**Answer: Spec headers have been updated.**

- 7. The architectural drawings show a concrete pad under the bleachers at the football stadium. There are no details for thickness of the pad or size of the pad. There are no details on the C drawings that show a pad being there at all. Please provide the size and thickness of the pad as well as the concrete strength for this.

**Answer: Site plan has been updated to show concrete pad under football bleachers. Coordination needed with architecture and structural on required concrete pad thickness based on spectator load.**

8. The C drawings do not show where slope matting is required. There are some fairly steep banks on the site. Please have the site engineer address where slope matting is needed to avoid erosion issues on these banks.  
**Answer: Assume slope matting to be used in areas with 3:1 fill slope.**
9. Addendum 2 added a note to the two sets of concrete stairs at the gym. It calls for these to be masonry walls. These walls and the stair details are on the structural drawings and are shown as cast in place concrete. Should they be built per the detail on the C drawings or per the structural drawing?  
**Answer: per structural dwgs**
10. Sidewalks – please provide the concrete strength to be used for sidewalks. The structural drawings note – all other concrete to be 4000 psi. Does this apply to sidewalks?  
**Answer: to be clarified later**
11. Please have the site engineer clarify what striping is to be thermoplastic. One not on the bus parking lot shows that cross hatching is thermoplastic and the parking lines for the busses are not noted as thermoplastic. Are the arrows and stop bars on the road way into and around the site to be thermoplastic or regular parking lot striping. Are parking spaces to be thermoplastic or regular parking lot paint?  
**Answer: All parking lot and roadway striping to be thermoplastic.**
12. A101C – calls out “Aluminum fence” with a double gate between Building A and C. This not identified on the site plan like all of the other fencing. Is this required? If so, please designate what type of fence it is – height, ornamental, and special hardware on the gates?  
**Answer: regular chain link fence, no special gate hardware required**
13. Are water and sewer tap fees to be in the contract or paid by the owner?  
**Answer: Water and sewer tap fees to be in contract paid by contractor per note on Sheet C8.0.**
14. A404 shows some markings that could be benches in the Locker rooms. Please advise what these are – if benches provide width and length as there are different sizes drawn.  
**Answer: yes, these are benches. Drawings are in scale**
15. A404 what type of base are these lockers built on? We cannot find a detail to see if they sit on the floor or are on a concrete base. Please provide a detail.  
**Answer: no base**

**RFI 20:** Edison FDoard’s questions:

1. Spec section 064116 Plastic Laminate Architectural Cabinets
  1. Please confirm you WILL require actual certificates for this project, or does it just have to be a company that is AWI certified? The certificates cost and require field coordination.  
**Answer: Certified is fine.**
  2. 2.1 G 2 – Would our standard drawer construction be acceptable. Please see the attached document and notice the testing results in the bottom right corner.
  3. 2.1 I 1 – can we please use dowel construction for our drawers? Again, see attached and our test results with our standard construction.  
**Answer: This is allowed in the spec section.**
  4. 2.3 B – We highly recommend the use of 5 knuckle hinges in school environments because concealed hinges naturally/eventually can come out of alignment in high use environments. If 5 knuckle hinges are not acceptable, may we use our standard 120-degree hinge in lieu of 135 degree?  
**Answer: Concealed is desired.**
  5. 2.3 E & F – Would you consider using a 5-disc tumbler lock in lieu of a deadbolt lock for the casework. It would save a good amount of money. We find the 5-disc tumbler usually meets our school client’s needs.  
**Answer: yes**

6. 2.3 H – calls for metal standards. The industry standard is 32 mm drilling. Would you please consider allowing 32mm shelf drilling which is better quality and cost less.
7. 2.3 J 1 – calls for satin stainless steel for the finish. Can we provide epoxy powder coated hardware in lieu of stainless?  
**Answer: Yes**
2. Spec section 123553 Laboratory Casework
  1. 1.1A 5 – is data required in the casework anywhere? We do not see any on the drawings.
  2. 2.1 A 2 – Campbell Rhea changed their name to ICI many years back. Please update your records.  
**Answer: noted**
  3. 2.5 A calls for lipped overlay design. 2.5B calls for a vertical grain match. To achieve the vertical grain match, we would need to change to full flush overlay design. This is 95% of what we sell so you can achieve the vertical grain match. Please advise if this is acceptable.  
**Answer: Yes**
  4. 2.4 E calls for full extension slides. Would the  $\frac{3}{4}$  extension be acceptable? It would save you money.  
**Answer: Full Extension slides is desired.**
  5. 2.4 F – are label holders really required on all drawers?  
**Answer: no**
  6. 2.4 G – may we use 5-disc tumbler locks in lieu of 5 pin?  
**Answer: yes**
  7. 2.9 B, C, D, & E – We don't see any of these on the plans. Are they required? If so, please provide more details.
21. RFI 21: A713 Lobby A100A and Corridor 001C – do not call out any stair treads for the stairs that are in these areas. Please advise if stair treads are required for these 3 stairs.  
**Answer: Lobby A100A is terrazzo with a terrazzo tread and Corridor 001C is rubber, same as the other stairs.**

# GRIER MIDDLE SCHOOL REPLACEMENT

GASTONIA, NC

PIN# 3555646402

GASTON COUNTY SCHOOLS



GRIER MIDDLE SCHOOL REPLACEMENT



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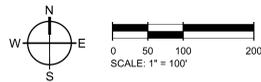
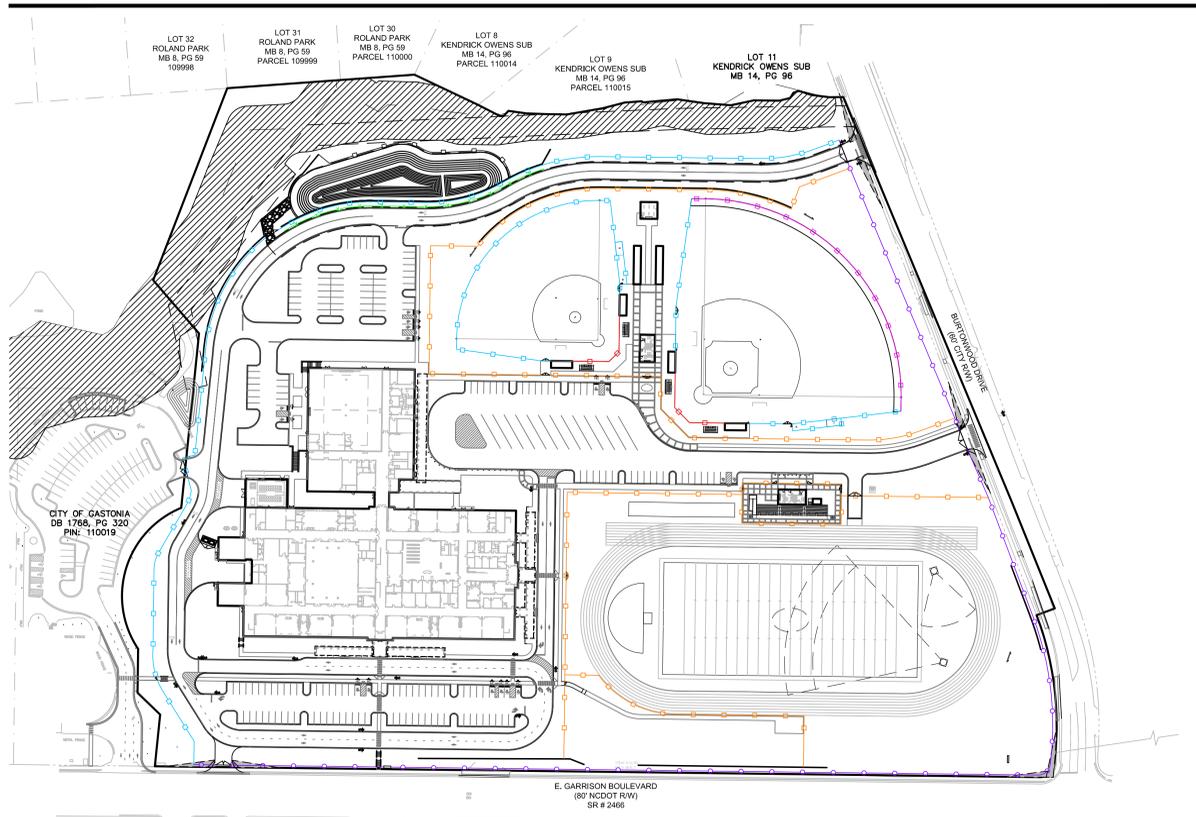
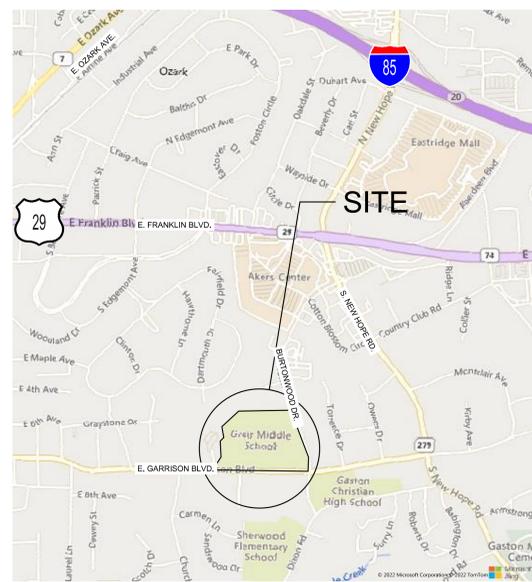
No.	Description	Date
1	AGENCY REVIEW	11.11.2022
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: MEM  
CHECKED BY: TNC

TITLESHEET

C1.0

VICINITY MAP (NTS)



SHEET INDEX

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C7.4	SITE DETAILS
C7.5	SITE DETAILS
C8.0	WATER & SEWER PLAN
C8.1	SEWER PROFILES
C8.2	UTILITY DETAILS
C8.3	UTILITY DETAILS
L1.0	LANDSCAPE PLAN
L1.1	TREE PRESERVATION PLAN
L1.2	LANDSCAPE SCHEDULE, DETAILS & NOTES
L2.0	IRRIGATION LAYOUT
L2.1	IRRIGATION LAYOUT

PROJECT DESCRIPTION

GASTON COUNTY SCHOOL DISTRICT IS PROPOSING TO REPLACE THE EXISTING GRIER MIDDLE SCHOOL AND SPORTS FIELDS ON PIN# 3555646402 IN GASTONIA, NORTH CAROLINA.

GENERAL NOTES

PROJECT SURVEY INFORMATION AND CONTRACTOR VERIFICATION REQUIREMENTS

- BOUNDARY, TOPOGRAPHIC, TREE, AND OTHER EXISTING CONDITIONS SHOWN ARE FROM SURVEY PREPARED BY R.B. PHARR & ASSOCIATES, P.A. SURVEYING COMPANY DATED NOVEMBER 28, 2022.
- PER REFERENCE SURVEY, ALL ELEVATIONS ARE BASED ON NAVD88 VERTICAL DATUM. HORIZONTAL DATUM IS STATE PLANE (NC NAD 83).
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PERIMETER BOUNDARY PROPERTY CORNERS AND VERIFYING BOUNDARY DATA AGAINST CONSTRUCTION PLANS AND/OR ELECTRONIC FILE INFORMATION PROVIDED TO THE CONTRACTOR.
- PRIOR TO STARTING CONSTRUCTION, INCLUDING LAND DISTURBING ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO TOPOGRAPHIC, TREE, STORM DRAINAGE FACILITIES, AND ALL UTILITIES. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ENGINEER. THEREFORE, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UTILITIES. ANY DISCREPANCIES OR CONFLICTS IDENTIFIED DURING VERIFICATION OF EXISTING CONDITIONS AND UTILITIES SHALL BE REPORTED TO THE OWNER AND ENGINEER. ANY COSTS ASSOCIATED WITH CORRECTIVE WORK OR DAMAGES THAT ARE A RESULT OF THE CONTRACTOR NOT VERIFYING EXISTING CONDITIONS AND THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.

PROJECT CONTACTS

OWNER:  
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943 OSCEOLA STREET  
GASTONIA, NC 28054  
CONTACT: PAUL NAULT

ARCHITECT:  
LS3P  
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CIVIL ENGINEER & LANDSCAPE ARCHITECT:  
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CONTACT: MARC MEDDAUGH  
PHONE: 980-312-5450 X 308

SURVEYOR:  
R.B. PHARR & ASSOCIATES, P.A.  
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CHARLOTTE, NC 28204  
CONTACT: DARYL KASEMAN



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REVISIONS:

No.	Description	Date
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

LEGEND & REVISION NOTES

C1.1

# DRAWING LEGEND

NOTE: THIS LEGEND DOES NOT APPLY TO EXISTING CONDITIONS' SHEET(S). THOSE ARE SHOWN IN THE ORIGINAL FORMAT AS RECEIVED BY THE SURVEYOR

OBJECTS AND SYMBOLS	EXISTING	NEW	OBJECTS AND SYMBOLS	EXISTING	NEW	ABBREVIATIONS	EXISTING	NEW	SWPP PLAN LEGEND
Right of Way	---	---	Benchmark	⊕	N/A	Sewer Easement	Ex. S.E.	S.E.	Turf Reinforcement Mat (TR)
Lot Line	---	---	Sanitary Sewer Manhole	⊕	⊕	Storm Easement	Ex. W.E.	W.E.	Sodding (S)
Centerline	---	---	Sanitary Sewer Manhole ID #	⊕	⊕	Drainage Easement	Ex. D.E.	D.E.	Surface Roughening (SR)
Centerline (Same as Existing)	---	---	Sanitary Sewer Cleanout	⊕	⊕	General Utility Easement	Ex. G.U.E.	G.U.E.	Temporary Seeding (TS)
Easement	---	---	Double Sanitary Sewer Service (Residential Only)	⊕	⊕	Access Easement	Ex. A.E.	A.E.	Permanent Seeding (PS)
Setback	---	---	Single Sanitary Sewer Service (Residential Only)	⊕	⊕	Ingress/Egress Easement	Ex. I.E.E.	I.E.E.	Mulching (M)
Sanitary Sewer (Gravity)	ES	ES	TYPE 1 Storm Drainage Structure (CB)	⊕	⊕	Pond Maintenance Easement	Ex. P.M.E.	P.M.E.	Typical Lot Erosion Control Plan (LE)
Sanitary Sewer (Force Main)	FM	FM	TYPE 16 Storm Drainage Structure (CI-16)	⊕	⊕	Water Surface Elevation	Ex. W.S.E.	W.S.E.	Flexible Growth Medium (FG)
Water Line	EW	EW	TYPE 17 Storm Drainage Structure (Right) (CI-17)	⊕	⊕	Polymer Chloride Pipe	Ex. PVC	PVC	Erosion Control Blanket (EC)
Curb & Gutter (Straight)	---	---	TYPE 18 Storm Drainage Structure (Left) (CI-17)	⊕	⊕	Reinforced Concrete Pipe	Ex. RCP	RCP	Dust Control (DC)
Curb & Gutter (Roll)	---	---	TYPE 18 Storm Drainage Structure (CI-16)	⊕	⊕	High Density Polyethylene Pipe	Ex. HDPE	HDPE	Bonded Fiber Mats (BF)
Previous Phase Storm Drain Pipe	---	---	Drop Inlet (DI)	⊕	⊕	Ductile Iron Pipe	Ex. DIP	DIP	Concrete Washout Basin (CW)
Storm Drain Pipe	SD	SD	Isolation Box (IB)	⊕	⊕	Corrugated Metal Pipe	Ex. CMP	CMP	Portable Toilet (PT)
Drainage Flow Arrow	N/A	---	Yard Inlet (YI)	⊕	⊕	Home Owner's Association	Ex. HOA	HOA	Block & Stone Inlet Protection (BS)
Roof Drain	RD	RD	Control Structure (CS)	⊕	⊕	Property Owners Association	Ex. POA	POA	Temp. Sediment Control Tube (ST)
Subsurface Drainage	UD	UD	Storm Drainage Structure ID #	⊕	⊕				Temp. Rock Ditch Checks (RC)
Silt Fence, Standard	SF	SF	Telephone Box	⊕	N/A				Turf Reinforcement Mat Outlet Protection (TM)
Silt Fence, Reinforced	RSF	RSF	Telephone Manhole	⊕	N/A				Filter Fabric Inlet Protection (FF)
Phase Line	N/A	N/A	Electrical Box	⊕	N/A				Temp. Curb Inlet Weep Filter (CF)
Drainage Basin Limits	N/A	N/A	Electrical Manhole	⊕	N/A				Curb Inlet Sediment Filter (CS)
Flood Zone	---	---	Power Pole	⊕	N/A				Both Curb Inlet Filters (BI)
Conduit	C	C	Light Pole	⊕	N/A				Construction Entrance (CE)
Natural Gas	G	G	Fire Hydrant Assembly	⊕	N/A				Dandy Sack or Gate Gator Inlet Protection (DS)
Overhead Electrical	EP	EP	Water Blowoff	⊕	N/A				
Underground Electrical	UP	UP	Water Line Bends, Angle Valves	⊕	N/A				
Underground Telephone	UT	UT	Water Line Valve	⊕	N/A				
Underground Cable	UC	UC	Water Line Reducer	⊕	N/A				
Underground Fiber Optic	UFO	UFO	Single Water Service (Residential Only)	⊕	N/A				
Fence	F	F	Double Water Service (Residential Only)	⊕	N/A				
Elevation Contour	---	---	ADA Accessible Parking Space	⊕	N/A				
Revision Cloud (Encloses Revision)	N/A	---	Spot Elevation	⊕	N/A				
			Drainage Basin Area	⊕	N/A				
			Keynote	⊕	N/A				
			Parking Count ID #	⊕	N/A				
			Lot #	⊕	N/A				
			Revision ID #	⊕	N/A				
			Rip Rap at Pipe Outlet	⊕	N/A				

## REVISION LOG

- ADDENDUM 1 - 1.31.2023**
- A. SHEET C3.0 - E&SC PHASE 1: Make the following revisions:
    - Relocate existing BMP serving Schiele Museum and adjust silt fence, diversion ditch, LOD.
    - Add inlet protection around existing CMP outlet pipe in existing BMP.
    - Demolish existing fence on Schiele property.
    - Revisions to temporary and permanent sewer mains and manholes as indicated.
    - Revise construction sequence.
  - B. SHEET C3.1 - E&SC PHASE 2: Make the following revisions:
    - Show permanent relocated BMP serving Schiele Museum, adjust silt fence.
    - Add diversion ditch and inlet protection for temporary pipe as indicated.
    - Add temporary storm pipe under construction drive
    - Revise construction sequence.
  - C. SHEET C3.2 - E&SC PHASE 3: Make the following revisions:
    - Remove Temporary Skimmer Sediment Basin #2B
    - Revise Basin #2A to Temporary Sediment Basin, and make revisions as indicated.
    - Connect Temp Structure A2 to Structure A30.
    - Add silt fence on west side of site as indicated
    - Revise construction sequence
  - D. SHEET C3.3 - E&SC PHASE 4: Make the following revisions:
    - Revise construction fencing and silt fence as shown
    - Temporary Sediment Basin #2A revised
    - Revise construction sequence
  - E. SHEET C3.4 - E&SC PHASE 5: Make the following revisions:
    - Permanent seeding revised in areas indicated
    - Revise construction sequence
  - F. SHEET C3.6 - E&SC DETAILS
    - Added Details 1.0 and 7.1
  - G. SHEET C4.0 - SITE PLAN: Make the following revisions:
    - Added sight triangle hatch on legend
    - Separated ornamental fence and chain link fence line type on legend
    - Added 10'x10' and 10'x70' sight triangles to entrances and corner of Garrison Blvd and Burtonwood
    - Changed landscape buffer to 10'
    - Revised football/track concession layout
    - Added stairs with cheek wall and sidewalk connection to Schiele Museum property
    - Added road connection to Schiele Museum and updated retaining wall
    - Added BMP Access Easement
    - Added label for 30" Sewer G.U.E. Easement
  - H. SHEET C4.1 - FIRE PROTECTION PLAN: Make the following revisions:
    - Added "200" hose stretch to all sides of all buildings (radius measurement) label to circle indicating that minimum requirement is met
  - I. SHEET C4.2 - ADA ACCESSIBILITY ROUTE PLAN
    - Added FFE to all buildings and concessions
    - Updated accessibility routes that changed
  - J. SHEET C5.0 - DRAINAGE PLAN: Make the following revisions:
    - Emergency spillway shifted to the right, away from retaining wall
    - CB added to storm sewer line between CBs A2 & A3.1 to avoid conflicts with trees
    - Storm pipe between B14.1 - B5.1 removed, and storm pipe added between B14 - B5. Storm pipe size increased (B5 - B5.1)
    - Inlet drainage areas removed and exhibited in drainage report
    - Storm structure A18 rotated
    - Labels added to following storm structures: B5.1, A31, B28, and storm pipe A15-A31
    - Property line type made continuous
  - K. SHEET C5.1 - STORM DRAINAGE PROFILES: Make the following revisions:
    - Storm pipe run A1-A29 shallowed
    - Updates to profile labels
  - L. SHEET C5.2 - STORM DRAINAGE PROFILES: Make the following revisions:
    - HGL's revised
    - Water crossings added to profiles
    - Updates to profile labels
  - M. SHEET C5.3 - STORM DRAINAGE PROFILES: Make the following revisions:
    - Storm pipe run B1-B11 shallowed
    - Water crossings added to profiles
  - N. SHEET C5.4 - STORM DRAINAGE PROFILES: Make the following revisions:
    - Sewer crossings added to profiles
  - O. SHEET C5.7 - WET POND DETAILS: Make the following revisions:
    - Revise outlet pipe downstream invert and slope
    - Shift emergency spillway location
  - P. ADD SHEET C5.8 - ROOF DRAINAGE PLAN
    - Roof drainage revised and sizes added at main school building
    - Roof drainage added at football concession, baseball/softball concession, and metal building
  - Q. SHEET 6.0 - OVERALL GRADING PLAN: Make the following revisions:
    - Relocate existing BMP serving Schiele Museum.
    - Update retaining walls along driveway plan East of site to accommodate relocated BMP
    - Add a driveway connection between the site and Schiele Museum property.
    - Flatten loading dock and adjust concrete ramp grades.
    - Add stairs to sidewalk connection to Schiele Museum property.
    - Adjust grades around the concrete pad plan south of proposed track.
    - Adjust grades along driveway connection to Burtonwood Drive plan north of site.
  - R. SHEET C6.3 - ENLARGED GRADING PLAN: Make the following revisions:
    - Relocate existing BMP serving Schiele Museum.
    - Update retaining walls along driveway plan East of site to accommodate relocated BMP
    - Add a driveway connection between the site and Schiele Museum property.
    - Add callout to concrete band surrounding buildings.
  - S. SHEET C6.2 - ENLARGED GRADING PLAN: Make the following revisions:
    - Flatten loading dock and adjust concrete ramp grades.
    - Add stairs to sidewalk connection to Schiele Museum property.
    - Add callout to concrete band surrounding buildings.

- T. SHEET C6.3 - ENLARGED GRADING PLAN: Make the following revisions:
  - Adjust grades along driveway connection to Burtonwood Drive plan north of site.
- U. SHEET C6.4 - ENLARGED GRADING PLAN: Make the following revisions:
  - Adjust grades around the concrete pad plan south of proposed track.
- V. SHEET C7.1 - SITE DETAILS: Make the following revisions:
  - Revised handrail detail on Details 9 and 10
- W. SHEET C7.2 - SITE DETAILS: Make the following revisions:
  - Added note to Detail 1
- X. SHEET C7.3 - SITE DETAILS: Make the following revisions:
  - Revised Baseball/Softball concession building and fence layout on Detail 1
- Y. SHEET C7.4 - SITE DETAILS: Make the following revisions:
  - Removed Detail 4 which was a tree grate detail
- Z. SHEET C8.0 - WATER & SEWER PLAN: Make the following revisions:
  - Updated Sewer layout
  - Updated Water layout
  - Updates to callouts and notes
  - Grease Trap updated to match MEP Plans
- AA. SHEET C8.1 - SEWER PROFILES: Make the following revisions:
  - Updated Vertical design of Sewer
  - Added Drop Manholes to the plan
- AB. SHEET L1.0 - LANDSCAPE PLAN: Make the following revisions:
  - Added 10'x10' and 10'x70' sight triangles to entrances and corner of Garrison Boulevard and Burtonwood Drive
  - Changed landscape buffer to 10'
  - Revised perimeter buffer calculations
  - Revised landscape around backflow preventers
  - Revised landscape around sidewalk connection to Schiele Museum
  - Revised landscape around road connection to Schiele Museum
  - Revised landscape around Football/Track concession building
  - Revised landscape around Baseball/Softball concession building
- AC. SHEET L1.2 - LANDSCAPE SCHEDULE, DETAILS, & NOTES: Make the following revisions:
  - Updated plant schedule for tree sizes
  - Updated plant schedule for quantities

## ADDENDUM 2 - 2.7.2023

- A. SHEET C3.0 - E&SC PHASE 1: Make the following revisions:
  - Remove temporary fill over sewer
- B. SHEET C3.1 - E&SC PHASE 2: Make the following revisions:
  - Adjust surface grade at sewer manholes as indicated.
- C. SHEET C3.2 - E&SC PHASE 3: Make the following revisions:
  - Update label to reflect new survey information (2 water meters found in same vault).
  - Adjust surface grade at sewer manholes as indicated.
- D. SHEET C3.3 - E&SC PHASE 4: Make the following revisions:
  - Update label to reflect new survey information (2 water meters found in same vault).
- E. SHEET C4.0 - SITE PLAN: Make the following revisions:
  - Service Yard updated to be heavy duty concrete.
  - Stair west of the basement updated to extend retaining wall.
  - Stair at NW of basement removed stairs and reduced retaining wall.
  - Removed 2 flag poles. Only 1 flag pole remaining.
- F. SHEET C6.0 - OVERALL GRADING PLAN: Make the following revisions:
  - Specify types of retaining walls
- G. SHEET C6.1 - ENLARGED GRADING PLAN: Make the following revisions:
  - Specify types of retaining walls
  - Add top of wall and bottom of wall spot elevations to 2 sets of stairs at gymnasium
- H. SHEET C6.2 - ENLARGED GRADING PLAN: Make the following revisions:
  - Specify types of retaining walls
  - Revise bottom of wall spot elevation.
- I. SHEET C6.4 - ENLARGED GRADING PLAN: Make the following revisions:
  - Specify types of retaining walls
- J. SHEET C7.2 - SITE DETAILS: Make the following revisions:
  - Detail #2 was revised to remove aluminum curb and remove detail callout on Track Surfacing note.
- K. SHEET C7.4 - SITE DETAILS:
  - Add Detail #9, 18" Ribbon Curb
  - Add Detail #9, 35" Flag Pole
- L. ADD SHEET C7.5 - SITE DETAILS
  - Typical retaining wall details for reference only
- M. SHEET C8.0 - WATER & SEWER PLAN: Make the following revisions:
  - Update label to reflect new survey information (2 water meters found in same vault).

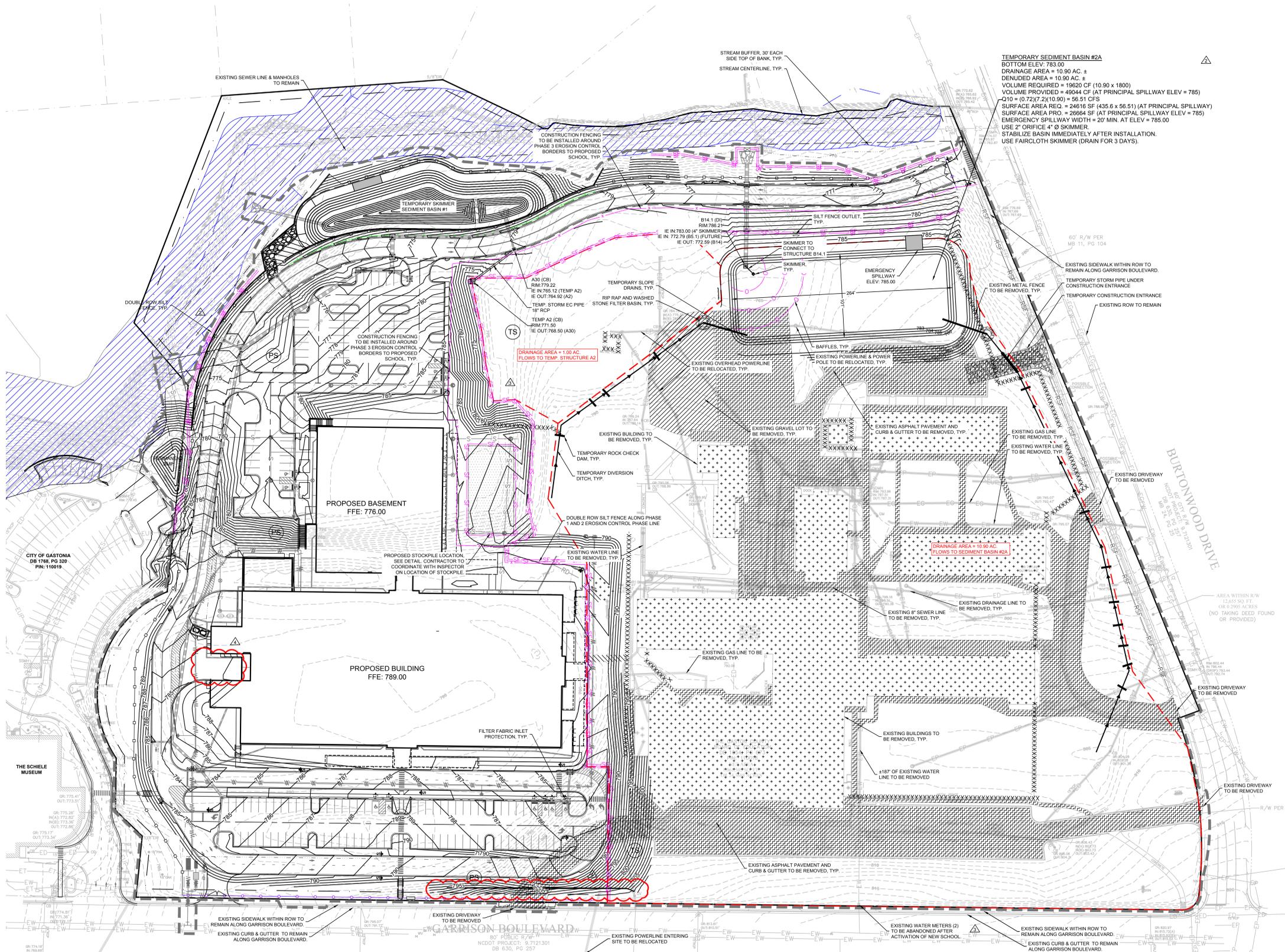
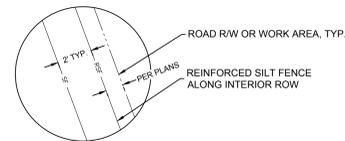
## ADDENDUM 3 - 2.14.2023

- A. SHEET C3.2 - E&SC PHASE 3: Make the following revisions:
  - Show updated grading of wall along E Garrison and the truck loading dock area.
- B. SHEET C3.3 - E&SC PHASE 4: Make the following revisions:
  - Show updated grading of wall along E Garrison and the truck loading dock area.
- C. SHEET C3.4 - E&SC PHASE 5: Make the following revisions:
  - Show grading changes on an overall scale (Wall Adjustment and Loading Dock)
- D. SHEET C4.0 - SITE PLAN: Make the following revisions:
  - Landscape buffer label updated remove fence.
  - Add concrete pad under football bleacher.
  - Updated hatch for football stadium visitor site concrete pad to be heavy duty concrete to be coordinated with structural engineer.
  - Retaining wall along Garrison Boulevard shifted.
  - Legend updated with color coordinated linetypes for fence types and heights.
- E. SHEET C5.0 - DRAINAGE PLAN: Make the following revisions:
  - Show updated callouts for trench drains and update connection points for the track trench drain
- F. SHEET C5.7 - STORM DRAINAGE DETAILS: Make the following revisions:
  - Sheet created and additional details added.
- G. SHEET C5.8 - STORM DRAINAGE DETAILS: Make the following revisions:
  - Sheet created and additional details added.
- H. SHEET C5.10 - ROOF DRAINAGE PLAN: Make the following revisions:
  - Show additional roof drainage pipes to pickup canopy drainage.
- I. SHEET C6.0 - OVERALL GRADING PLAN: Make the following revisions:
  - Show grading changes on an overall scale (Wall Adjustment and Loading Dock)
- J. SHEET C6.2 - ENLARGED GRADING PLAN: Make the following revisions:
  - Updated grading of proposed retaining wall located along E Garrison.
  - Updated grading of proposed truck loading dock area.
- K. SHEET C7.1 - SITE DETAILS: Make the following revisions:
  - Updated Detail 1 to show dumpster enclosure wall and gate height.
  - Removed Detail 3.
- L. SHEET C7.3 - SITE DETAILS: Make the following revisions:
  - Updated Detail 1 to clarify fence types and heights.
- M. SHEET L1.0 - LANDSCAPE PLAN: Make the following revisions:
  - Revised canopy and understory tree locations by shifted retaining wall along Garrison Boulevard.
  - Seed hatch updated to go up to retaining wall.
- N. SHEET L1.1 - LANDSCAPE SCHEDULE, DETAILS, & NOTES: Make the following revisions:
  - Updated plant schedule for seeding.

**EROSION CONTROL SEQUENCE OF CONSTRUCTION:**

1. ONCE CONTRACTOR HAS MET WITH EROSION CONTROL INSPECTOR AND HAS DEEMED PHASE 2 OF CONSTRUCTION AS STABILIZED, THE CONTRACTOR CAN THEN PROCEED WITH PHASE 3 OF EROSION CONTROL.
2. THE NEW SCHOOL SHOULD BE FULLY FUNCTIONING AND SERVICEABLE BEFORE MOVING FORWARD WITH PHASE 3 OF CONSTRUCTION.
3. REAR ACCESS DRIVE AND RETAINING WALL TO BE INSTALLED AND STABILIZED. WESTERN EDGE OF ACCESS ROAD TO BE BUILT FIRST AND TEMPORARY DIVERSION DITCH MOVED TO THE TOP OF THE ROAD TO ENSURE DRAINAGE IS CONVEYED TO BASIN #1 DURING ROAD AND WALL CONSTRUCTION.
4. STRAW WATTLES SHOULD BE UTILIZED BETWEEN THE FILL SLOPES AND RETAINING WALL INSTALLATION AND THE NEARBY BUFFER IN AREAS WHERE SILT FENCE DOES NOT EXIST.
5. SKIMMER SEDIMENT BASIN #1 TO REMAIN THROUGH THIS PHASE. BASIN SHALL NOT BE CONVERTED INTO PERMANENT BMP UNTIL ALL UPGRADIENT AREAS HAVE BEEN STABILIZED.
6. CONTRACTOR SHALL INSTALL CONSTRUCTION FENCING AROUND PHASE 3 OF CONSTRUCTION TO KEEP UNWANTED PEDESTRIAN TRAFFIC OUT OF THE AREA.
7. CONTRACTOR SHALL INSTALL PERIMETER CONTROLS AND ALL OTHER EROSION CONTROL FEATURES PRIOR TO BUILDING DEMOLITION.
8. CONTRACTOR TO COORDINATE WITH EROSION CONTROL INSPECTOR THROUGHOUT DEMOLITION OF SCHOOL AND EXISTING STORM DRAINS TO ENSURE CONVEYANCE OF RUNOFF TO SEDIMENT BASINS.
9. STABILIZE SITE AS AREAS ARE BROUGHT TO FINISHED GRADE.
10. COORDINATE WITH EROSION CONTROL INSPECTOR PRIOR TO REMOVAL OF EROSION CONTROL MEASURES.
11. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, U.S. DEPT. OF AGRICULTURE, GASTONIA EROSION CONTROL ORDINANCE, AND THE GASTONIA UDO.

**DOUBLE ROW SILT FENCE BLOWUP (NTS.)**



**TEMPORARY SEDIMENT BASIN #2A**  
 BOTTOM ELEV. 783.00  
 DRAINAGE AREA = 10.90 AC. ±  
 DENUDE AREA = 10.90 AC. ±  
 VOLUME REQUIRED = 19820 CF (AT PRINCIPAL SPILLWAY ELEV = 785)  
 VOLUME PROVIDED = 49044 CF (AT PRINCIPAL SPILLWAY ELEV = 785)  
 $Q_{10} = (0.72)(7.2)(10.90) = 56.51$  CFS  
 SURFACE AREA REQ. = 24616 SF (455.6' x 56.51') (AT PRINCIPAL SPILLWAY)  
 SURFACE AREA PRO. = 26664 SF (AT PRINCIPAL SPILLWAY ELEV = 785)  
 EMERGENCY SPILLWAY WIDTH = 20' MIN. AT ELEV = 785.00  
 USE 2" ORIFICE 4" Ø SKIMMER.  
 STABILIZE BASIN IMMEDIATELY AFTER INSTALLATION.  
 USE FAIRCLOTH SKIMMER (DRAIN FOR 3 DAYS).

**STABILIZATION NOTE:**  
 SEE LANDSCAPE PLAN FOR DIRECTION ON FINAL STABILIZATION (BUILDINGS, SOG, SEED, ETC.). ANY DISTURBED AREAS NOT EXPLICITLY DESCRIBED ON THE LANDSCAPE PLAN SHALL BE PERMANENT SEED PER THE SCHEDULE PROVIDED IN DETAILS.

**E&SC PLAN LEGEND**

Erosion Control Mat (NCEG STD. 6.17)	EM
Seeding (NCEG STD. 6.12)	S
Surface Roughening (NCEG STD. 6.03)	SR
Temporary Seeding (NCEG STD. 6.10)	TS
Permanent Seeding (NCEG STD. 6.11)	PS
Mulching (NCEG STD. 6.14)	M
Dist Control (NCEG STD. 6.84)	DC
Filter Fabric Inlet Protection (See Detail)	IFP
Inlet Protection with Sediment Tube (See Detail)	IST
Temp. Rock Dam (NCEG STD. 6.03)	TRD
RIPRAP Outlet Protection (NCEG STD. 6.41)	ROP
Construction Entrance (See Detail)	CE
Stone Outlet, Standard	SO
Silt Fence, Standard (NCEG STD. 6.62)	SF
Silt Fence, Reinforced	RSF
Construction Documents Phase Line	CL
Drainage Area Delineation	DA
Limits of Disturbance	LD

**DEMOLITION LEGEND**

DEMO EXISTING GRAVEL	[Pattern]
DEMO EXISTING BUILDING	[Pattern]
DEMOLISH EXISTING SITE FEATURE	XXXXXXXXXX
DEMO EXISTING CONCRETE / PAVEMENT	[Pattern]

- NOTES:**
1. DIVERSION SWALES SHOWN ON PLANS TO APPROXIMATE LOCATION TO SHOW INTENT. CONTRACTOR SHALL REFERENCE PLANS AND DETAILS TO INSTALL DIVERSION SWALES TO MEET THE INTENT OF THE PLANS.
  2. PROVIDE APPROPRIATE INLET PROTECTION FOR VARIOUS PHASES OF THE CONSTRUCTION. HARDWARE CLOTH & GRAVEL PROTECTION SHALL BE PROVIDED FOR INLETS IN NON-PAVED AREAS. SILT BAG INLET PROTECTION SHALL BE PROVIDED FOR INLETS IN PAVED AREAS.
  3. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NCEG EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, THE US DEPARTMENT OF AGRICULTURE, US SOIL CONSERVATION SERVICE, NCEG, AND GASTON COUNTY.
  4. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFF-SITE GRADING, THE CONTRACTOR MUST CONTACT AND HAVE WRITTEN PERMISSION FROM THE APPROPRIATE PROPERTY OWNERS BEFORE PROCEEDING.
  5. IF BORROW OR WASTE MATERIAL IS REQUIRED OR GENERATED DURING GRADING OPERATIONS, AN APPROVED EROSION AND SEDIMENT CONTROL PERMIT MUST BE SECURED FOR THE BORROW OR WASTE MATERIAL SITE PRIOR TO INITIATION OF ANY LAND DISTURBING ACTIVITY.
  6. NPDES INSPECTION RECORDS TO BE MAINTAINED ON SITE.
  7. SOIL TEST TO DETERMINE FERTILIZER TYPE AND APPLICATION RATES.



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW SEAMONWHITESIDE**  
 MOUNT PLEASANT, SC 843.884.1667  
 GREENVILLE, SC 864.298.0534  
 SUMMERVILLE, SC 843.972.0710  
 SPARTANBURG, SC 864.272.1272  
 CHARLOTTE, NC 980.312.5450  
 WWW.SEAMONWHITESIDE.COM



227 WEST TRADE STREET SUITE 700  
 CHARLOTTE, NORTH CAROLINA 28202  
 TEL. 704.333.6666 FAX 704.333.2926  
 WWW.LS3P.COM



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**REVISIONS:**

No.	Description	Date
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

**E&SC PHASE 3**  
**C3.2**

REVISIONS:

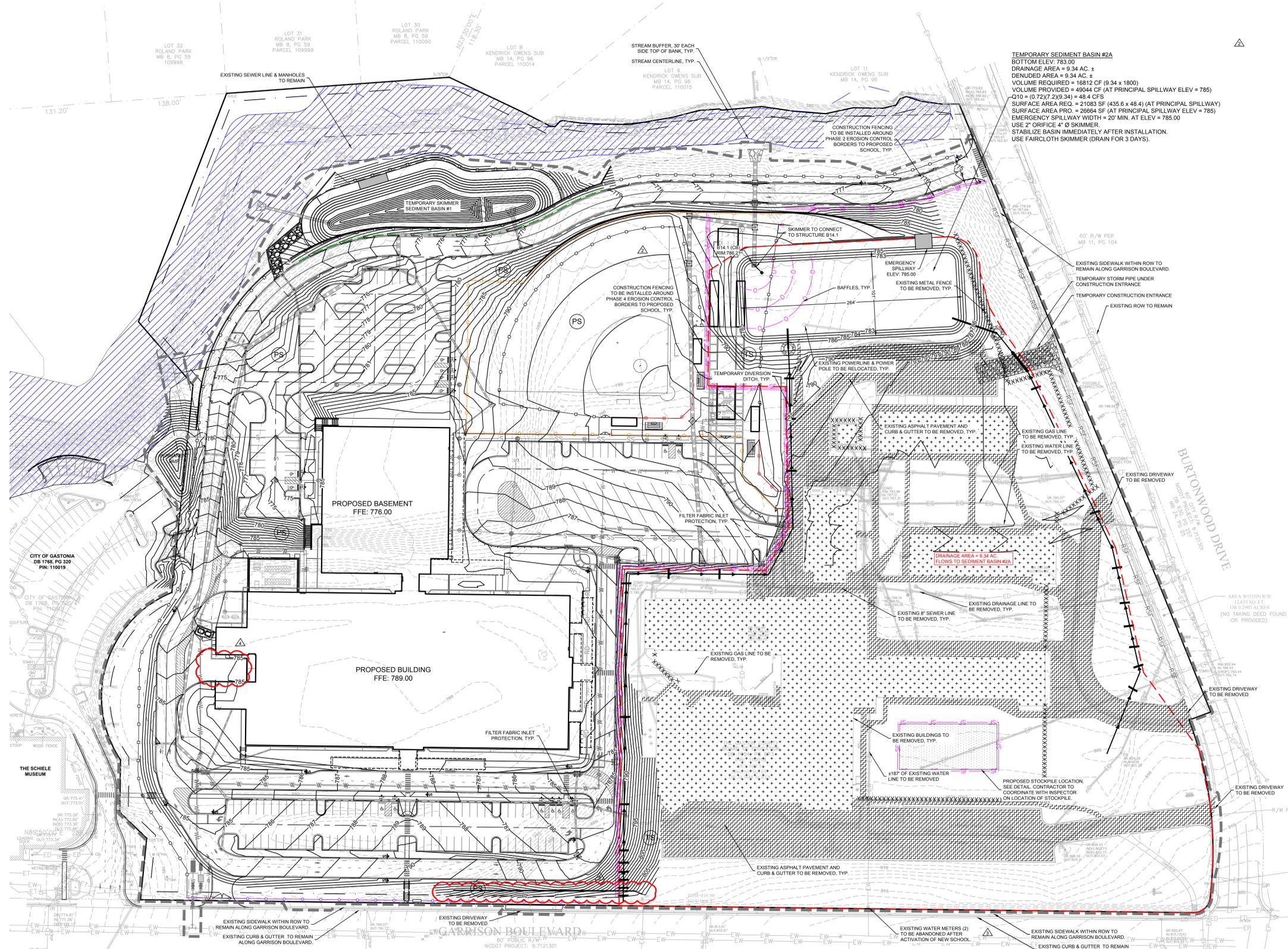
No.	Description	Date
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

**EROSION CONTROL SEQUENCE OF CONSTRUCTION:**

1. CONTRACTOR SHALL INSTALL CONSTRUCTION FENCING AROUND PHASE 4 OF CONSTRUCTION TO KEEP UNWANTED PEDESTRIAN TRAFFIC OUT OF THE AREA.
2. SKIMMER SEDIMENT BASIN #1 TO REMAIN THROUGH THIS PHASE. BASIN SHALL NOT BE CONVERTED INTO PERMANENT BMP UNTIL ALL UPGRADIENT AREAS HAVE BEEN STABILIZED.
3. CONTRACTOR TO COORDINATE WITH EROSION CONTROL INSPECTOR THROUGHOUT DEMOLITION OF SCHOOL AND EXISTING STORM DRAINS TO ENSURE CONVEYANCE OF RUNOFF TO SEDIMENT BASINS.
4. PERMANENTLY STABILIZE SITE AS AREAS ARE BROUGHT TO FINISHED GRADE.
5. BUS PARKING, DRIVE AISLES AND BASEBALL FIELD INSTALLED IN THIS PHASE ARE TO BE IN THEIR FINAL CONDITION AND OPERATIONAL (PAVED, CURB AND GUTTER, PERMANENTLY STABILIZED) TO ENSURE CLEAN WATER DRAINING INTO PERMANENT STORM DRAINAGE SYSTEM.
6. INLET PROTECTION TO REMAIN ON INLETS ADJACENT TO CONSTRUCTION PHASE LINE THROUGHOUT THIS PHASE.
7. COORDINATE WITH EROSION CONTROL INSPECTOR PRIOR TO REMOVAL OF EROSION CONTROL MEASURES.
8. PHASE 4 OF CONSTRUCTION TO BE COMPLETED PRIOR TO THE START OF THE SCHOOL YEAR.
9. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, U.S. DEPT. OF AGRICULTURE, GASTONIA EROSION CONTROL ORDINANCE, AND THE GASTONIA UDA.

**STABILIZATION NOTE:**  
 SEE LANDSCAPE PLAN FOR DIRECTION ON FINAL STABILIZATION (BUILDINGS, SOD, SEED, ETC.). ANY DISTURBED AREAS NOT EXPLICITLY DESCRIBED ON THE LANDSCAPE PLAN SHALL BE PERMANENT SEEDDED PER THE SCHEDULE PROVIDED IN DETAILS.



**TEMPORARY SEDIMENT BASIN #2A**  
 BOTTOM ELEV. 783.00  
 DRAINAGE AREA = 9.34 AC. ±  
 DENUDED AREA = 9.34 AC. ±  
 VOLUME REQUIRED = 16812 CF (9.34 x 1800)  
 VOLUME PROVIDED = 49044 CF (AT PRINCIPAL SPILLWAY ELEV = 785)  
 Q10 = (0.72)(7.2)(9.34) = 48.4 CFS  
 SURFACE AREA REQ. = 21083 SF (435.6 x 48.4) (AT PRINCIPAL SPILLWAY)  
 SURFACE AREA PRO. = 26984 SF (AT PRINCIPAL SPILLWAY ELEV = 785)  
 EMERGENCY SPILLWAY WIDTH = 20' MIN. AT ELEV = 785.00  
 USE 2" ORIFICE 4" Ø SKIMMER.  
 STABILIZE BASIN IMMEDIATELY AFTER INSTALLATION.  
 USE FAIRCLOTH SKIMMER (DRAIN FOR 3 DAYS).

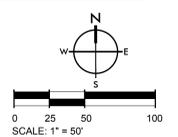
**E&S C PLAN LEGEND**

Erosion Control Mat (NCEQ STD. 6.17)	EM
Seeding (NCEQ STD. 6.12)	S
Surface Roughening (NCEQ STD. 6.03)	SR
Temporary Seeding (NCEQ STD. 6.10)	TS
Permanent Seeding (NCEQ STD. 6.11)	PS
Mulching (NCEQ STD. 6.14)	M
Dust Control (NCEQ STD. 6.94)	DC
Filter Fabric Inlet Protection (See Detail)	IF
Inlet Protection with Sediment Tube (See Detail)	IS
Temp. Rock Dam (NCEQ STD. 6.03)	RD
RIPRAP Outlet Protection (NCEQ STD. 6.41)	RO
Construction Entrance (See Detail)	CE
Stone Outlet, Standard	SO
Silt Fence, Standard (NCEQ STD. 6.02)	SF
Silt Fence, Reinforced (See Detail)	RSF
Construction Documents Phase Line	CL
Drainage Area Delineation	DA
Limits of Disturbance	LD

**DEMOLITION LEGEND**

DEMO EXISTING GRAVEL	[Pattern]
DEMO EXISTING BUILDING	[Pattern]
DEMOLISH EXISTING SITE FEATURE	XXXXXXXXXX
DEMO EXISTING CONCRETE / PAVEMENT	[Pattern]

- NOTES:**
1. DIVERSION SWALES SHOWN ON PLANS TO APPROXIMATE LOCATION TO SHOW INTENT. CONTRACTOR SHALL REFERENCE PLANS AND DETAILS TO INSTALL DIVERSION SWALES TO MEET THE INTENT OF THE PLANS.
  2. PROVIDE APPROPRIATE INLET PROTECTION FOR VARIOUS PHASES OF THE CONSTRUCTION. HARDWARE CLOTH & GRAVEL PROTECTION SHALL BE PROVIDED FOR INLETS IN NON-PAVED AREAS. SILTY BAG INLET PROTECTION SHALL BE PROVIDED FOR INLETS IN PAVED AREAS.
  3. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NCEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, THE US DEPARTMENT OF AGRICULTURE, US SOIL CONSERVATION SERVICE, NCEQ, AND GASTON COUNTY.
  4. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFFSITE GRADING, THE CONTRACTOR MUST CONTACT AND HAVE WRITTEN PERMISSION FROM THE APPROPRIATE PROPERTY OWNERS BEFORE PROCEEDING.
  5. IF BORROW OR WASTE MATERIAL IS REQUIRED OR GENERATED DURING GRADING OPERATIONS, AN APPROVED EROSION AND SEDIMENT CONTROL PERMIT MUST BE SECURED FOR THE BORROW OR WASTE MATERIAL SITE PRIOR TO INITIATION OF ANY LAND DISTURBING ACTIVITY.
  6. NPDES INSPECTION RECORDS TO BE MAINTAINED ON SITE.
  7. SOIL TEST TO DETERMINE FERTILIZER TYPE AND APPLICATION RATES.



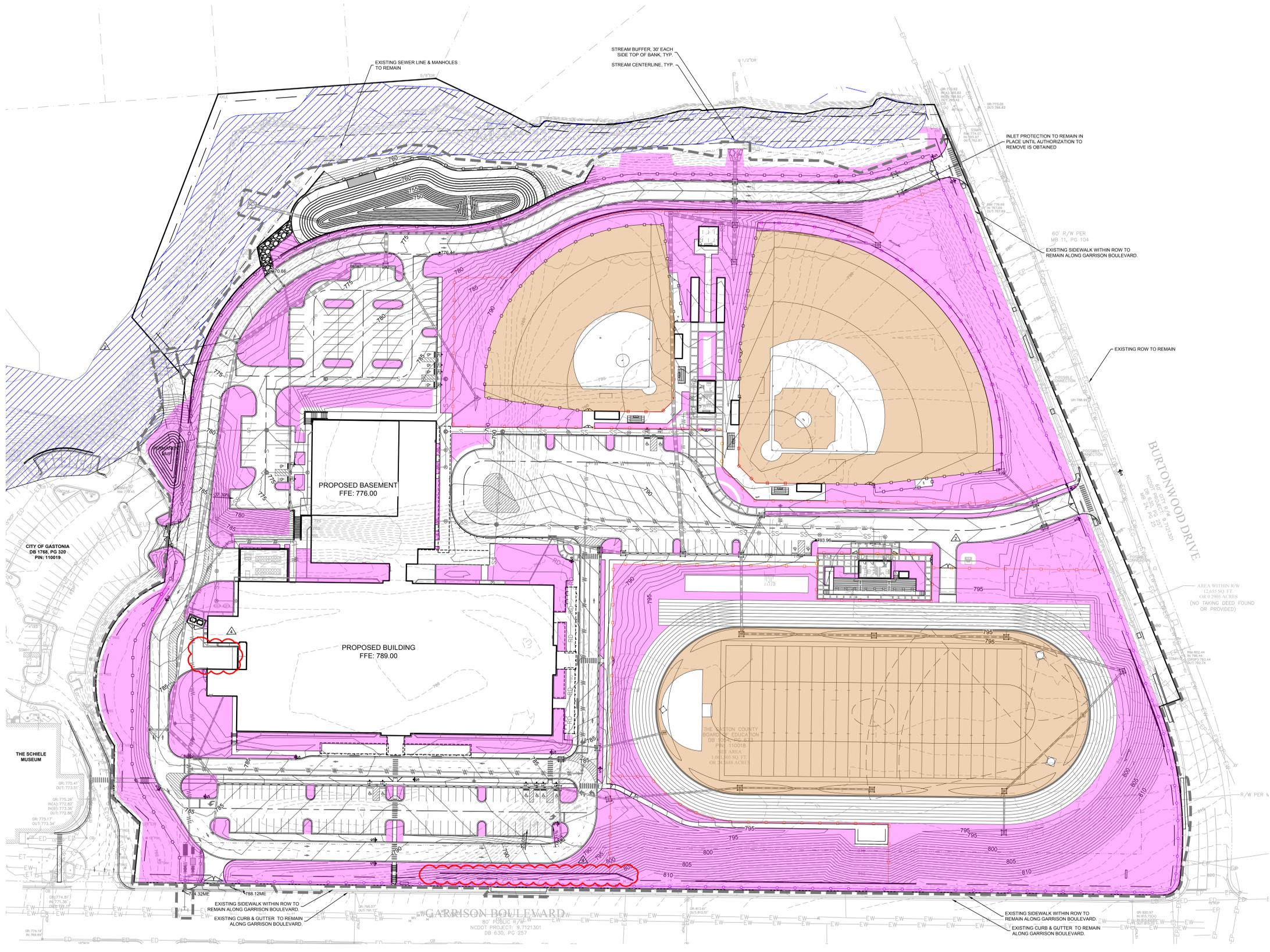
TOTAL LAND DISTURBANCE = 25 AC.

E  
D  
C  
B  
A

1 2 3 4 5 6

**EROSION CONTROL SEQUENCE OF CONSTRUCTION:**

1. THE CONTRACTOR SHALL DILIGENTLY & CONTINUOUSLY MAINTAIN ALL EROSION CONTROL MEASURES, STRUCTURES, STORM SEWERS AND DEVICES TO MINIMIZE EROSION. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH THE NCEQ NATURAL RESOURCES INSPECTOR SO THAT PERIODIC INSPECTIONS CAN BE PERFORMED AT APPROPRIATE STAGES OF CONSTRUCTION.
2. INSTALL REMAINDER OF SITE IMPROVEMENTS (BUILDINGS, PAVEMENT, ETC.)
3. WHEN ALL PROPOSED GRADES ARE ESTABLISHED & COMPLETE, STABILIZE ALL DISTURBED AREAS, AND CONTACT EROSION CONTROL INSPECTOR FOR FINAL INSPECTION.
4. CONTRACTOR TO REMOVE SKIMMER SEDIMENT BASIN #2A AND CONVERT SKIMMER SEDIMENT BASIN #1 TO PERMANENT BMP AFTER EACH DRAINAGE AREA HAS BEEN STABILIZED. SKIMMER SEDIMENT BASINS MUST NOT BE DECOMMISSIONED UNTIL THE DRAINAGE AREAS TO THESE MEASURES HAVE BEEN STABILIZED. ENSURE WEIR IS CUT INTO OOS E2 PER DRAINAGE PLANS.
5. REMOVE REMAINING EROSION CONTROL DEVICES AND IMMEDIATELY PERMANENTLY STABILIZE ONLY AFTER THE INSTALLATION OF STORM SEWER PIPES, STRUCTURES AND INLET PROTECTIONS.
6. UPON COMPLETION OF GRADING OPERATIONS, PROVIDE SEEDING AND EROSION CONTROL MATTING AS NECESSARY.
7. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, U.S. DEPT. OF AGRICULTURE, GASTONIA EROSION CONTROL ORDINANCE, AND THE GASTONIA UDC.



**STABILIZATION NOTE:**  
SEE LANDSCAPE PLAN FOR DIRECTION ON FINAL STABILIZATION (BUILDINGS, SOD, SEED, ETC.). ANY DISTURBED AREAS NOT EXPLICITLY DESCRIBED ON THE LANDSCAPE PLAN SHALL BE PERMANENTLY SEEDED PER THE SCHEDULE PROVIDED IN DETAILS.

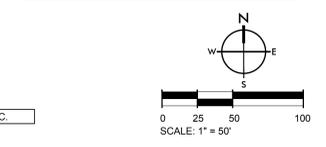
**E&S PLAN LEGEND**

Erosion Control Mat (NCEQ STD. 6.17)	EM
Sodding (NCEQ STD. 6.12)	S
Surface Roughening (NCEQ STD. 6.03)	SR
Temporary Seeding (NCEQ STD. 6.10)	TS
Permanent Seeding (NCEQ STD. 6.11)	PS
Mulching (NCEQ STD. 6.14)	M
Dust Control (NCEQ STD. 6.84)	DC
Filter Fabric Inlet Protection (See Detail)	[Symbol]
Inlet Protection with Sediment Tube (See Detail)	[Symbol]
Temp. Rock Dam (NCEQ STD. 6.03)	[Symbol]
RIPRAP Outlet Protection (NCEQ STD. 6.41)	[Symbol]
Construction Entrance (See Detail)	[Symbol]
Stone Outlet, Standard	[Symbol]
Silt Fence, Standard (NCEQ STD. 6.62)	SF
Silt Fence, Reinforced (See Detail)	RSF
Construction Documents Phase Line	[Symbol]
Drainage Area Delineation	[Symbol]
Limits of Disturbance	[Symbol]

**DEMOLITION LEGEND**

DEMO EXISTING GRAVEL	[Symbol]
DEMO EXISTING BUILDING	[Symbol]
DEMOLISH EXISTING SITE FEATURE	XXXXXXXXXX
DEMO EXISTING CONCRETE / PAVEMENT	[Symbol]
SEEDING HATCH	[Symbol]
SOD HATCH	[Symbol]

- NOTES:**
1. DIVERSION SWALES SHOWN ON PLANS TO APPROXIMATE LOCATION TO SHOW INTENT. CONTRACTOR SHALL REFERENCE PLANS AND DETAILS TO INSTALL DIVERSION SWALES TO MEET THE INTENT OF THE PLANS.
  2. PROVIDE APPROPRIATE INLET PROTECTION FOR VARIOUS PHASES OF THE CONSTRUCTION. HARDWARE CLOTH & GRAVEL PROTECTION SHALL BE PROVIDED FOR INLETS IN NON-PAVED AREAS. SILT BAG INLET PROTECTION SHALL BE PROVIDED FOR INLETS IN PAVED AREAS.
  3. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NCEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, THE US DEPARTMENT OF AGRICULTURE, US SOIL CONSERVATION SERVICE, NCEQ, AND GASTON COUNTY.
  4. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFFSITE GRADING, THE CONTRACTOR MUST CONTACT AND HAVE WRITTEN PERMISSION FROM THE APPROPRIATE PROPERTY OWNERS BEFORE PROCEEDING.
  5. IF BORROW OR WASTE MATERIAL IS REQUIRED OR GENERATED DURING GRADING OPERATIONS, AN APPROVED EROSION AND SEDIMENT CONTROL PERMIT MUST BE SECURED FOR THE BORROW OR WASTE MATERIAL SITE PRIOR TO INITIATION OF ANY LAND DISTURBING ACTIVITY.
  6. NPDES INSPECTION RECORDS TO BE MAINTAINED ON SITE.
  7. SOIL TEST TO DETERMINE FERTILIZER TYPE AND APPLICATION RATES.



TOTAL LAND DISTURBANCE = 25 AC.



**GRIER MIDDLE SCHOOL REPLACEMENT**

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**REVISIONS:**

No.	Description	Date
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: MEM  
CHECKED BY: TNC

**E&S PHASE 5**

**C3.4**

REVISIONS:

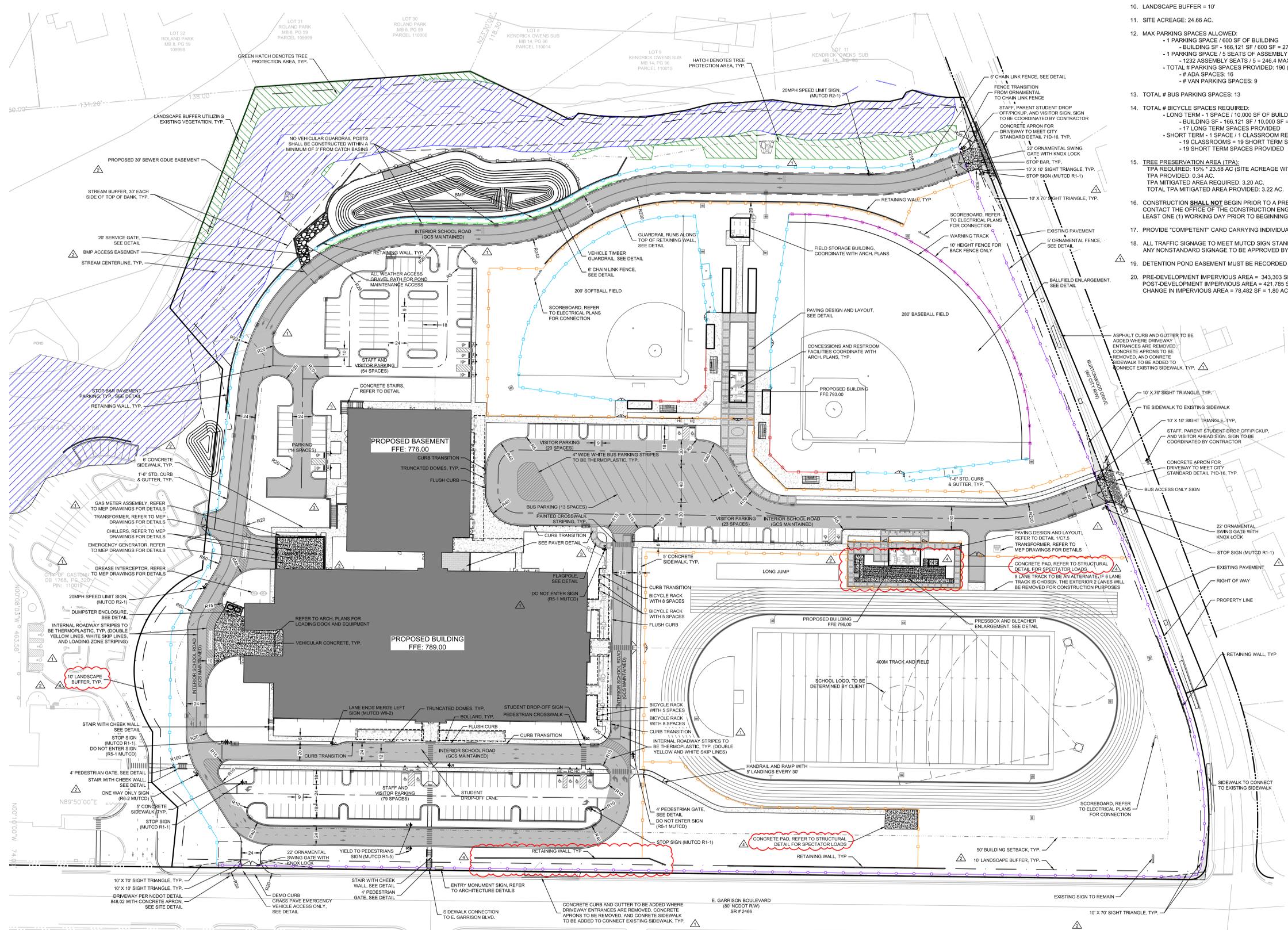
No.	Description	Date
1	AGENCY REVIEW	11.11.2022
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

**SITE PLAN**

**C4.0**

- NOTES:**
- BOUNDARY, TOPOGRAPHIC, AND OTHER EXISTING CONDITIONS SHOWN ARE FROM SURVEY PREPARED BY R.B. PHARR & ASSOCIATES, P.A., DATED NOVEMBER 28, 2022.
  - TOPOGRAPHIC DATUM IS NAD83/NAVD88.
  - ANYTHING SHOWN OUTSIDE OF THE BOUNDARY OF THIS PROJECT IS FOR DESCRIPTIVE PURPOSES ONLY.
  - THIS PROPERTY IS SHOWN ON TAX MAP TMS# 355664602.
  - PROJECT IS LOCATED IN ZONE X PER F.E.M.A. MAP COMMUNITY PANEL NO. 371035500J, EFFECTIVE 9/28/2007.
  - TWO RIVER'S UTILITIES IS THE WATER SYSTEM AND SANITARY SEWER SYSTEM PROVIDER.
  - CURRENT ZONING: RS-12
  - CURRENT AND PROPOSED LAND USE: MIDDLE SCHOOL
  - BUILDING SETBACK = 50'
  - LANDSCAPE BUFFER = 10'
  - SITE ACREAGE: 24.66 AC.
  - MAX PARKING SPACES ALLOWED:
    - 1 PARKING SPACE / 600 SF OF BUILDING
    - BUILDING SF = 166,121 SF / 600 SF = 276.9 MAX PARKING SPACES ALLOWED
    - 1 PARKING SPACE / 5 SEATS OF ASSEMBLY
    - 1232 ASSEMBLY SEATS / 5 = 246.4 MAX PARKING SPACES ALLOWED
    - TOTAL # PARKING SPACES PROVIDED: 190 (NOT INCLUDING BUS PARKING)
    - # ADA SPACES: 16
    - # VAN PARKING SPACES: 9
  - TOTAL # BUS PARKING SPACES: 13
  - TOTAL # BICYCLE SPACES REQUIRED:
    - LONG TERM - 1 SPACE / 10,000 SF OF BUILDING SF REQUIRED
    - BUILDING SF = 166,121 SF / 10,000 SF = 16.6(17) LONG TERM SPACES REQUIRED
    - 17 LONG TERM SPACES PROVIDED
    - SHORT TERM - 1 SPACE / 1 CLASSROOM REQUIRED
    - 19 CLASSROOMS = 19 SHORT TERM SPACES REQUIRED
    - 19 SHORT TERM SPACES PROVIDED
  - CONSTRUCTION SHALL NOT BEGIN PRIOR TO A PRELIMINARY CONSTRUCTION INSPECTION OF THE SITE. CONTACT THE OFFICE OF THE CONSTRUCTION ENGINEER/RIGHT-OF-WAY ADMINISTRATOR AT (704) 866-6015 AT LEAST ONE (1) WORKING DAY PRIOR TO BEGINNING CONSTRUCTION FOR INSPECTION.
  - PROVIDE "COMPETENT" CARD CARRYING INDIVIDUALS FOR OSHA REGULATIONS.
  - ALL TRAFFIC SIGNAGE TO MEET MUTCD SIGN STANDARDS. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ANY NONSTANDARD SIGNAGE TO BE APPROVED BY LANDSCAPE ARCHITECT.
  - DETENTION POND EASEMENT MUST BE RECORDED BEFORE RELEASE OF THE CERTIFICATE OF OCCUPANCY.
  - PRE-DEVELOPMENT IMPERVIOUS AREA = 343,303 SF = 7.88 AC  
 POST-DEVELOPMENT IMPERVIOUS AREA = 421,785 SF = 9.68 AC  
 CHANGE IN IMPERVIOUS AREA = 78,482 SF = 1.80 AC

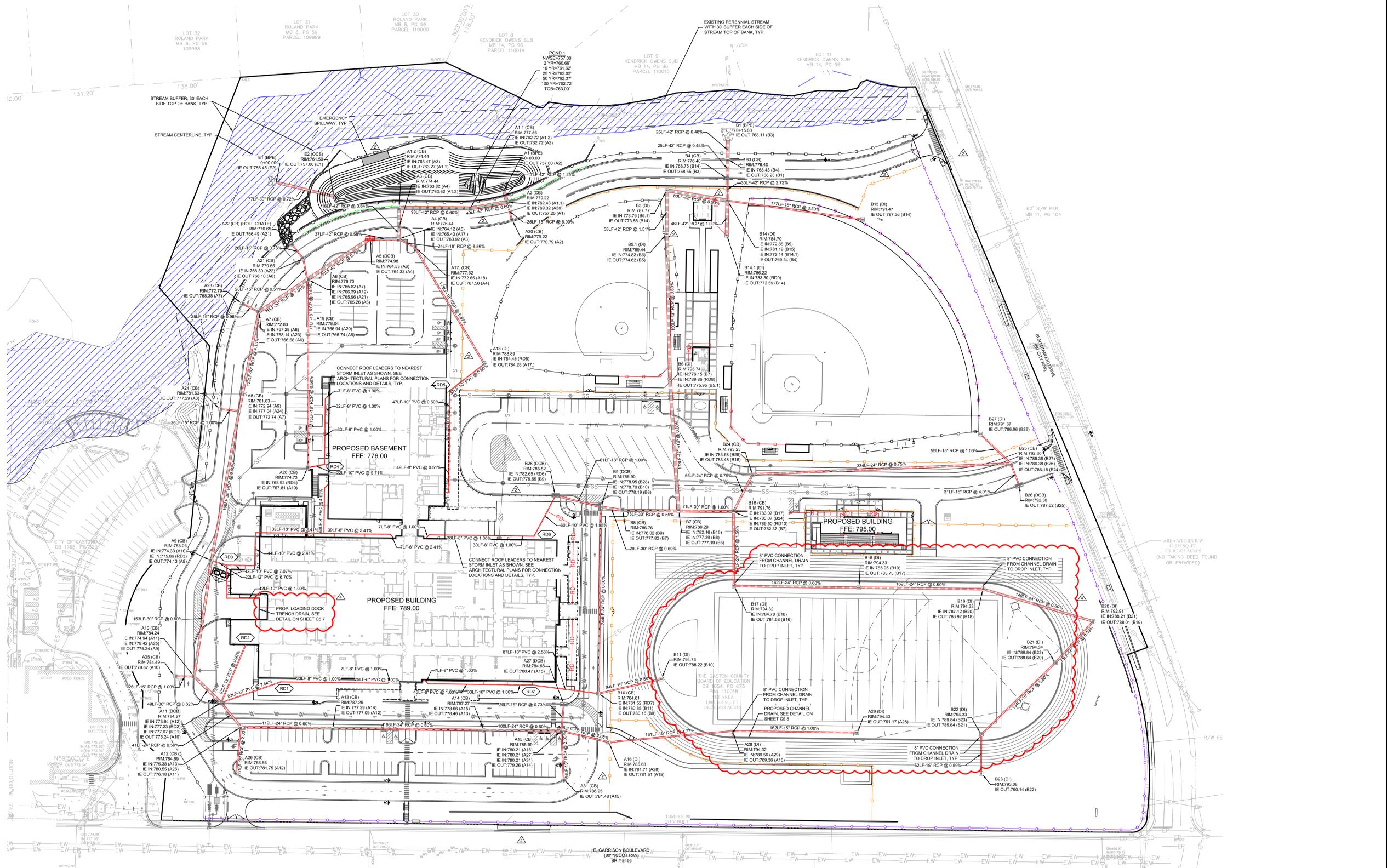


**MATERIAL LEGEND**

[Symbol]	ASPHALT PAVEMENT "STANDARD DUTY"
[Symbol]	ASPHALT PAVEMENT "HEAVY DUTY"
[Symbol]	VEHICULAR GRADE CONCRETE PAVEMENT
[Symbol]	CONCRETE SIDEWALK
[Symbol]	BUILDING HATCH
[Symbol]	HERRINGBONE PAVEMENT PATTERN
[Symbol]	SIGHT TRIANGLE
[Symbol]	VEHICULAR TIMBER GUARDRAIL, REFER TO PLAN
[Symbol]	5' HT. ORNAMENTAL FENCE, REFER TO PLAN
[Symbol]	4' HT. CHAIN LINK FENCE, REFER TO PLAN
[Symbol]	6' HT. CHAIN LINK FENCE, REFER TO PLAN
[Symbol]	10' HT. CHAIN LINK FENCE, REFER TO PLAN
[Symbol]	20' HT. CHAIN LINK FENCE, REFER TO PLAN
[Symbol]	TRAFFIC SIGN, REFER TO PLAN FOR SIGNAGE TYPE
[Symbol]	HANDICAP SIGN

**STANDARD DRAINAGE PLAN NOTES**

- FOR PROJECT SURVEY INFORMATION INCLUDING VERTICAL DATUM AND BENCHMARK LOCATIONS, SEE "PROJECT SURVEY INFORMATION AND CONTRACTOR VERIFICATION REQUIREMENTS" ON SHEET C1.0.
- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO TOPOGRAPHIC, TREE, STORM DRAINAGE FACILITIES, AND ALL UTILITIES. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ENGINEER. THEREFORE, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UTILITIES. ANY DISCREPANCIES OR CONFLICTS IDENTIFIED DURING VERIFICATION OF EXISTING CONDITIONS AND UTILITIES SHALL BE REPORTED TO THE OWNER AND ENGINEER. ANY COSTS ASSOCIATED WITH CORRECTIVE WORK OR DAMAGES THAT ARE A RESULT OF THE CONTRACTOR NOT VERIFYING EXISTING CONDITIONS AND THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- REFER TO DRAINAGE PROFILE SHEETS, ROADWAY PLAN & PROFILE SHEETS, GRADING PLAN SHEETS, AND ROADWAY & DRAINAGE DETAIL SHEETS FOR ADDITIONAL DRAINAGE AND GRADING INFORMATION AND REQUIREMENTS.
- DRAINAGE PIPE LENGTHS PROVIDED REPRESENT DISTANCES FROM CENTER OF BOX TO CENTER OF BOX. DRAINAGE PIPES ARE TO TERMINATE INSIDE THE DRAINAGE STRUCTURES IN ACCORDANCE WITH GOVERNING AUTHORITY REQUIREMENTS.
- ANY NECESSARY UNDERCUTTING OR MUCK AND FILL OPERATIONS ARE TO BE COORDINATED WITH THE OWNER AND THE PROJECT GEOTECHNICAL CONSULTANT PRIOR TO EXECUTING THE WORK.
- PRIOR TO BEGINNING WORK WITHIN ANY PUBLIC RIGHT-OF-WAY OR EASEMENT, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE ENCROACHMENT PERMITS FROM THE OWNER OR ENGINEER AND IS RESPONSIBLE FOR FOLLOWING ALL REQUIREMENTS SPECIFIED IN THESE PERMITS.
- REFER TO DRAINAGE PROFILE SHEETS FOR ADDITIONAL RIM ELEVATION INFORMATION.
- SEE ROADWAY & DRAINAGE DETAILS FOR UNDERDRAIN DETAIL & REQUIREMENTS.



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW**  
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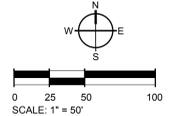
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REVISIONS:

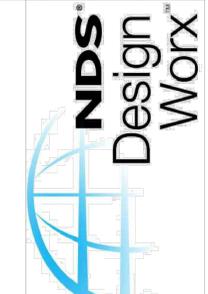
No.	Description	Date
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: MEM  
CHECKED BY: TNC

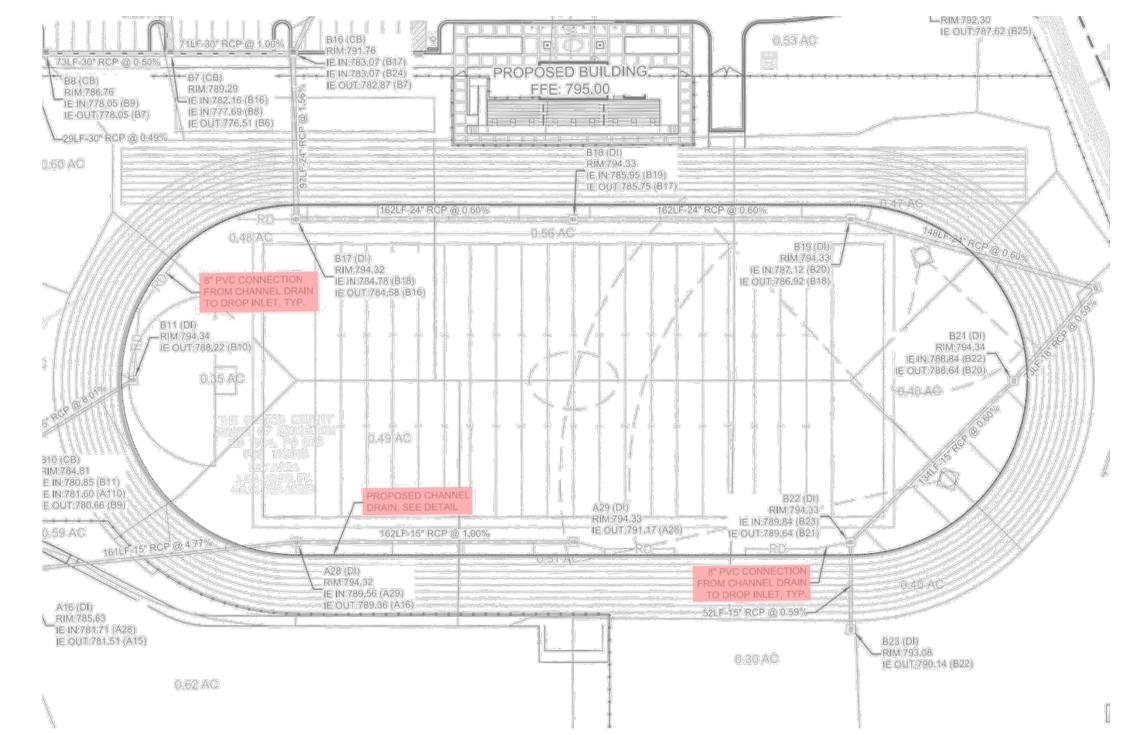
**DRAINAGE PLAN**  
**C5.0**







KEY SITE PLAN - OVERALL TRENCH DRAIN LAYOUT



**MATERIALS LIST**

PART NO.	QTY.
DS-090N	8
DS-091	8
DS-091N	8
DS-092	8
DS-093	8
DS-094	8
DS-094N	12
DS-095	8
DS-096	8
DS-097	8
DS-097N	16
DS-098	8
DS-099	8
DS-100	8
DS-100N	16
DS-101	8
DS-102	8
DS-103	8
DS-103N	16
DS-104	8
DS-105	8
DS-106	8
DS-106N	16
DS-107	8
DS-108	8
DS-109	8
DS-109N	16
DS-110	8
DS-111	8
DS-112	8
DS-112N	16
DS-113	8
DS-114	8
DSRC	158
1888	4
DS-240	4
DS-340	4
GRATES & SCREWS:	
DS-661LG	632
DS-661LGM	158

NDS DESIGN WORX  
DESIGNWORX@NDSPRO.COM  
GASTON COUNTY, SC

DRAWN BY: DATE: BO HOLLADAY 02-02-2023  
DWG. # TO: 003857 SHEET 1 OF 4  
DRAWING SCALE: NTS  
REV. DATE:

PROJECT NAME: FILE # TS\_DS\_RADIUS COUPLING GRATE\_ADA

**TECHNICAL SPECIFICATION**

**DURA SLOPE GRATE**  
RADIUS COUPLING GRATE

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # TS\_DS\_RADIUS COUPLING\_DSRC\_ADA\_LOAD B

**TECHNICAL SPECIFICATION**

DURA SLOPE RADIUS COUPLING-DSRC

**DURA SLOPE RADIUS COUPLING**  
DSRC

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # TS\_DS\_ACCESSORIES

**TECHNICAL SPECIFICATION**

**DURA SLOPE ACCESSORIES**

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # ID\_DS\_REBAR SUSPENSION

**INSTALLATION DETAIL**

**DURA SLOPE TRENCH DRAIN SYSTEM-GRATE TOP**  
REBAR SUSPENSION METHOD

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # TS\_DS\_CHANNEL DATA\_FLOW RATES

**TECHNICAL SPECIFICATION**

NDS-DURA SLOPE™ 6" WIDE X 48" LONG  
LOAD CLASS A - D\*

**DURA SLOPE™ TRENCH DRAIN**  
6" WIDE HDPE CHANNEL DRAIN—48" LONG, LOAD CLASS A-D\*

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # TS\_DS\_CHANNEL DATA\_FLOW RATES

**TECHNICAL SPECIFICATION**

NDS-DURA SLOPE™ 6" WIDE X 48" LONG  
LOAD CLASS A - D\*

**DURA SLOPE™ TRENCH DRAIN**  
6" WIDE HDPE CHANNEL DRAIN—48" LONG, LOAD CLASS A-D\*

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # TS\_DS\_POLY SLOTTED\_ADA\_LOAD B

**TECHNICAL SPECIFICATION**

DURA SLOPE POLY SLOTTED GRATE

**DURA SLOPE GRATE**  
POLY SLOTTED

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

PROJECT NAME: FILE # ID\_DS\_REBAR SUSPENSION

**INSTALLATION DETAIL**

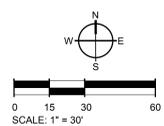
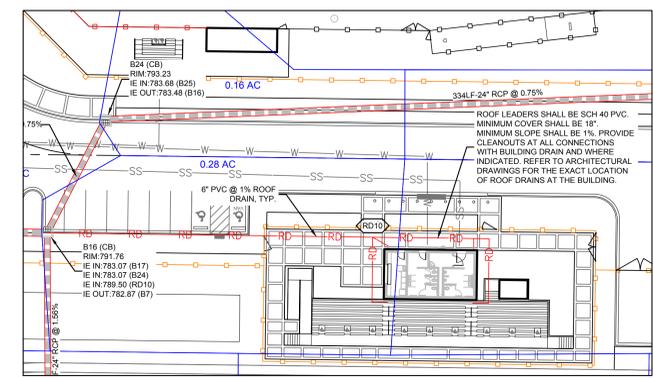
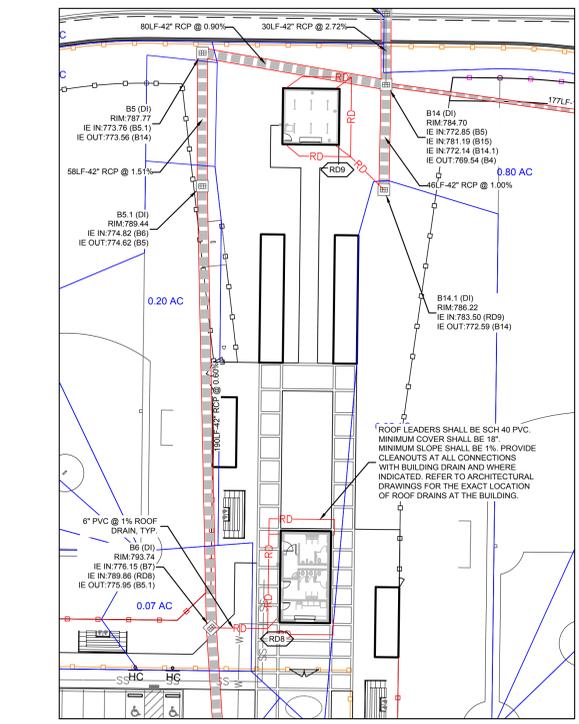
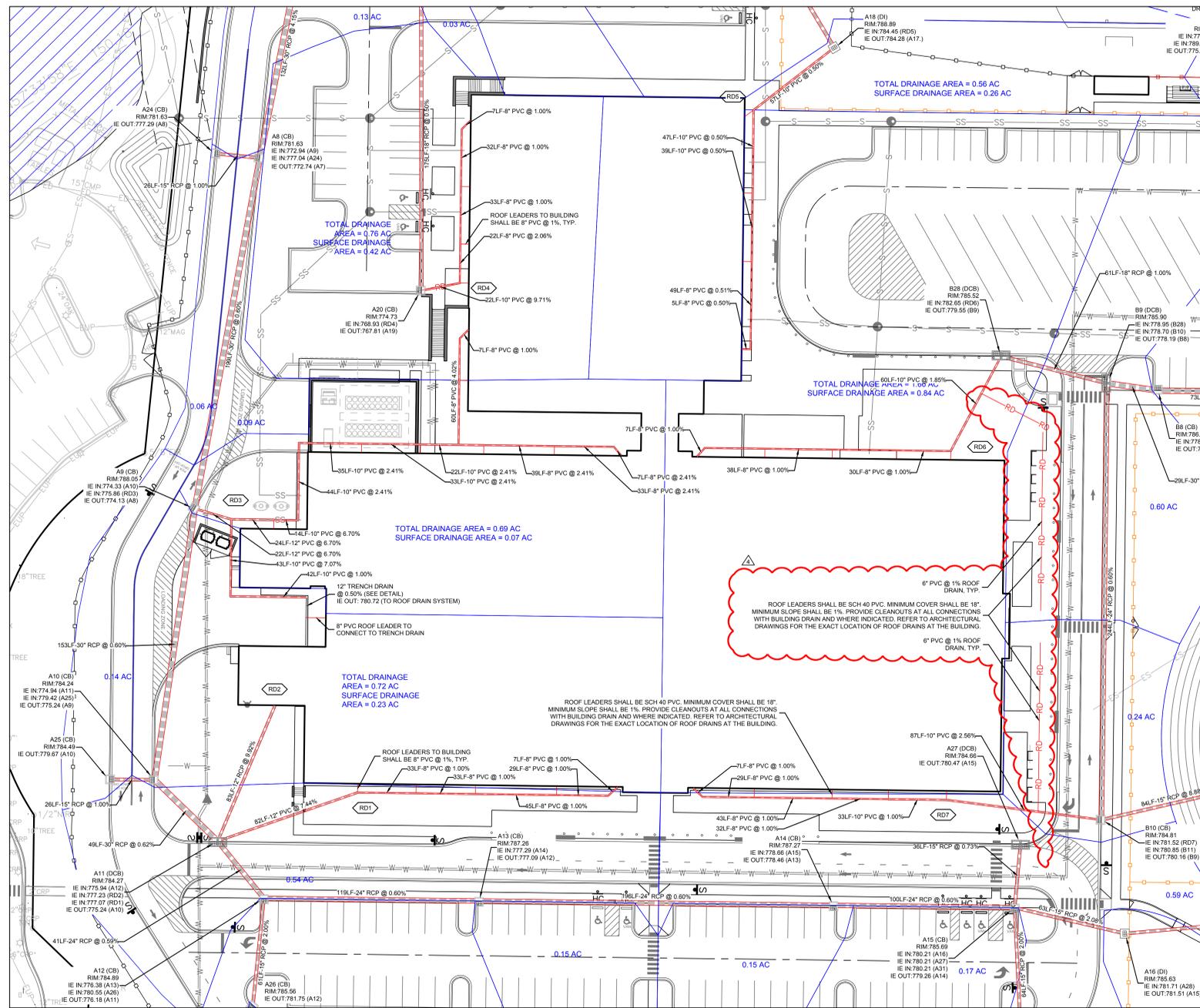
**DURA SLOPE TRENCH DRAIN SYSTEM-GRATE TOP**  
REBAR SUSPENSION METHOD

FOR PRODUCT ASSISTANCE, CONTACT NDS TECHNICAL SERVICE AT techservice@ndspro.com, DESIGN ASSISTANCE: designworx@ndspro.com  
801 N. HARVARD AVE., LINDSEY, CA 95247 WWW.NDSPRO.COM 1-800-726-5394

E  
D  
C  
B  
A

**STANDARD DRAINAGE PLAN NOTES**

- FOR PROJECT SURVEY INFORMATION INCLUDING VERTICAL DATUM AND BENCHMARK LOCATIONS, SEE "PROJECT SURVEY INFORMATION AND CONTRACTOR VERIFICATION REQUIREMENTS" ON SHEET C1.0.
- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO TOPOGRAPHIC, TREE, STORM DRAINAGE FACILITIES, AND ALL UTILITIES. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ENGINEER. THEREFORE, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT VERTICAL AND HORIZONTAL LOCATIONS OF ALL EXISTING UTILITIES. ANY DISCREPANCIES OR CONFLICTS IDENTIFIED DURING VERIFICATION OF EXISTING CONDITIONS AND UTILITIES SHALL BE REPORTED TO THE OWNER AND ENGINEER. ANY COSTS ASSOCIATED WITH CORRECTIVE WORK OR DAMAGES THAT ARE A RESULT OF THE CONTRACTOR NOT VERIFYING EXISTING CONDITIONS AND THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- REFER TO DRAINAGE PROFILE SHEETS, ROADWAY PLAN & PROFILE SHEETS, GRADING PLAN SHEETS, AND ROADWAY & DRAINAGE DETAIL SHEETS FOR ADDITIONAL DRAINAGE AND GRADING INFORMATION AND REQUIREMENTS.
- DRAINAGE PIPE LENGTHS PROVIDED REPRESENT DISTANCES FROM CENTER OF BOX TO CENTER OF BOX. DRAINAGE PIPES ARE TO TERMINATE INSIDE THE DRAINAGE STRUCTURES IN ACCORDANCE WITH GOVERNING AUTHORITY REQUIREMENTS.
- ANY NECESSARY UNDERCUTTING OR MUCK AND FILL OPERATIONS ARE TO BE COORDINATED WITH THE OWNER AND THE PROJECT GEOTECHNICAL CONSULTANT PRIOR TO EXECUTING THE WORK.
- PRIOR TO BEGINNING WORK WITHIN ANY PUBLIC RIGHT-OF-WAY OR EASEMENT, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE ENCROACHMENT PERMITS FROM THE OWNER OR ENGINEER AND IS RESPONSIBLE FOR FOLLOWING ALL REQUIREMENTS SPECIFIED IN THESE PERMITS.
- REFER TO DRAINAGE PROFILE SHEETS FOR ADDITIONAL RIM ELEVATION INFORMATION.
- SEE ROADWAY & DRAINAGE DETAILS FOR UNDERDRAIN DETAIL & REQUIREMENTS.



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW SEAMONWHITESIDE**  
 MOUNT PLEASANT, SC  
 GREENVILLE, SC  
 SUMMERVILLE, SC  
 SPARTANBURG, SC  
 CHARLOTTE, NC



227 WEST TRADE STREET SUITE 700  
 CHARLOTTE, NORTH CAROLINA 28202  
 TEL. 704.333.6686 FAX 704.333.2926  
 WWW.LS3P.COM



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REVISIONS:

No.	Description	Date
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

**ROOF DRAINAGE PLAN**  
**C5.10**

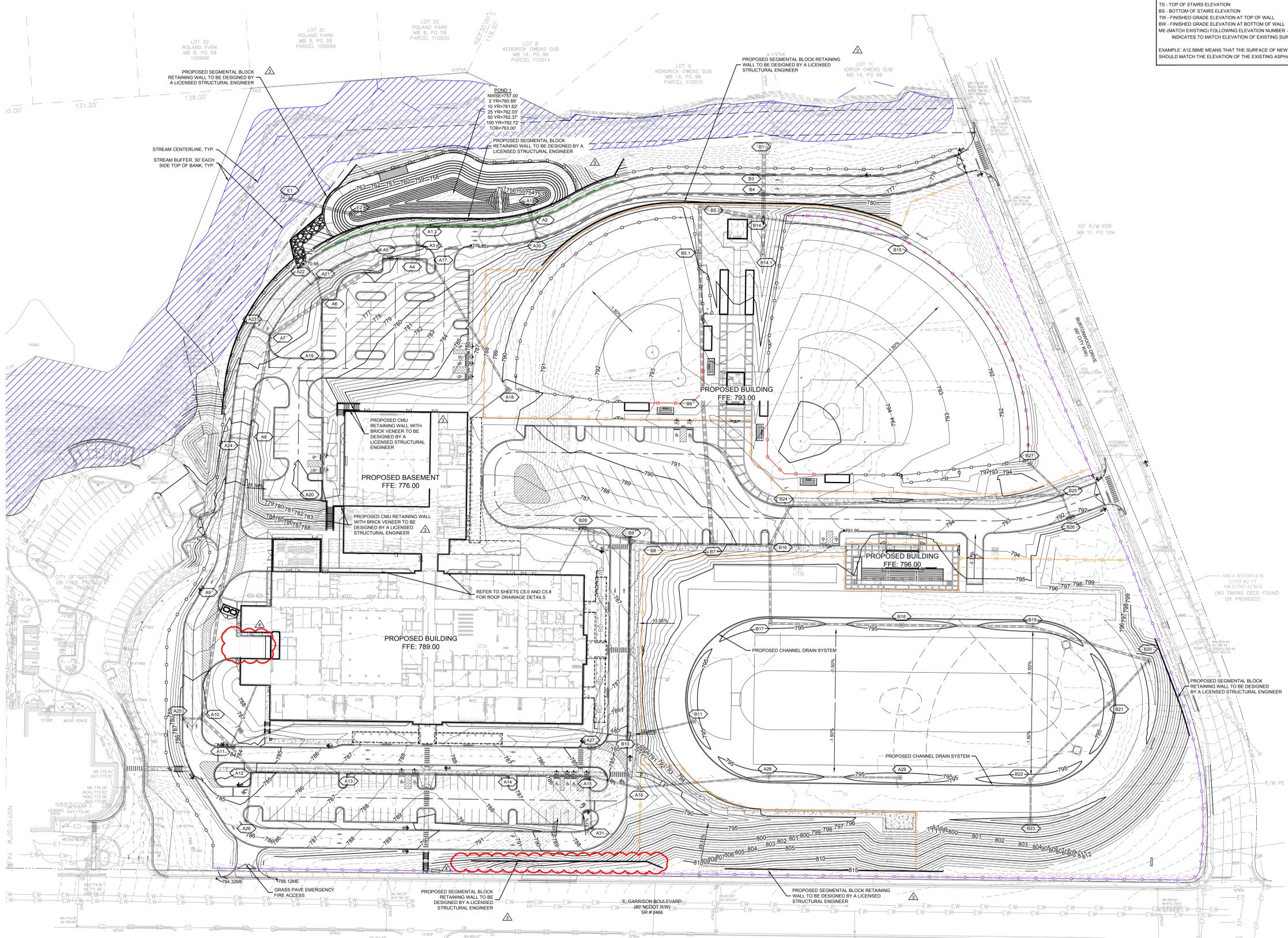
**STANDARD GRADING PLAN NOTES**

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- REFER TO SITE DETAIL SHEETS FOR ADDITIONAL DRAINAGE AND GRADING INFORMATION AND REQUIREMENTS.
- REFER TO THE "SPOT ELEVATION KEY" FOR INFORMATION ON SPOT ELEVATIONS.
- COORDINATE WITH THE OWNER AND THE PROJECT GEOTECHNICAL CONSULTANT FOR FILL COMPACTION AND TESTING REQUIREMENTS.
- CONTRACTOR TO SELF-VERIFY THAT SITE GRADES, PONDS, POND DIKES, DRAINAGE PIPES, AND DRAINAGE STRUCTURES ARE CONSTRUCTED PER THE PLANS PRIOR TO REQUESTING FINAL AS-BUILT SURVEY FROM SURVEYOR.

**SPOT ELEV KEY (FINISHED GRADING)**

A-(ASPHALT) SURFACE OF FINISHED ASPHALT ROADWAY OR WALKING PATH  
 C-(CONCRETE) CONCRETE PAVING  
 D-(DIRT) FINISHED GROUND ELEVATION  
 F-FLOW ELEVATION AT WHICH SURFACE WATER FLOWS INTO DRAINAGE STRUCTURE  
 G-SURFACE OF ASPHALT ADJACENT TO THROAT OR GRATE AT CURB INLET  
 H-SURFACE OF ACCESS COVER FOR JUNCTION OR ISOLATION BOX  
 I-SURFACE OF GRATE AT OUTSIDE EDGE FOR CATCH BASIN, GUTTER INLET, OR GRATED POND STRUCTURE  
 FFE - FINISHED FLOOR ELEVATION  
 G-(GUTTER) SURFACE OF FINISHED GUTTER AT LOWEST POINT (ALONG WATER FLOW PATH)  
 W-(WALK) SURFACE OF FINISHED CONCRETE OR INTERLOCKING PAVEMENT SIDEWALK, PATIO, PLAZA, OR SLAB  
 TC - TOP OF CURB ELEVATION  
 BC - BOTTOM OF CURB ELEVATION  
 TS - TOP OF STAIRS ELEVATION  
 BS - BOTTOM OF STAIRS ELEVATION  
 TW - FINISHED GRADE ELEVATION AT TOP OF WALL  
 BW - FINISHED GRADE ELEVATION AT BOTTOM OF WALL  
 ME-(MATCH EXISTING) FOLLOWING ELEVATION NUMBER - INDICATES TO MATCH ELEVATION OF EXISTING SURFACE AT POINT OF CONNECTION

EXAMPLE: A12.58ME MEANS THAT THE SURFACE OF NEW ASPHALT IS TO BE AT ELEVATION 12.58 WHICH SHOULD MATCH THE ELEVATION OF THE EXISTING ASPHALT SURFACE AT THE JOINT



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW SEAMONWHITESIDE**  
 MOUNT PLEASANT, SC 843.884.1667  
 GREENVILLE, SC 864.298.0534  
 SUMMERVILLE, SC 843.972.0710  
 SPARTANBURG, SC 864.272.1272  
 CHARLOTTE, NC 980.312.5450  
 WWW.SEAMONWHITESIDE.COM



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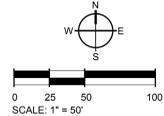
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**REVISIONS:**

No.	Description	Date
1	ADDENDUM 1	01.31.2023
2	ADDENDUM 2	02.07.2023
3	ADDENDUM 3	02.13.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

**OVERALL GRADING PLAN**  
**C6.0**



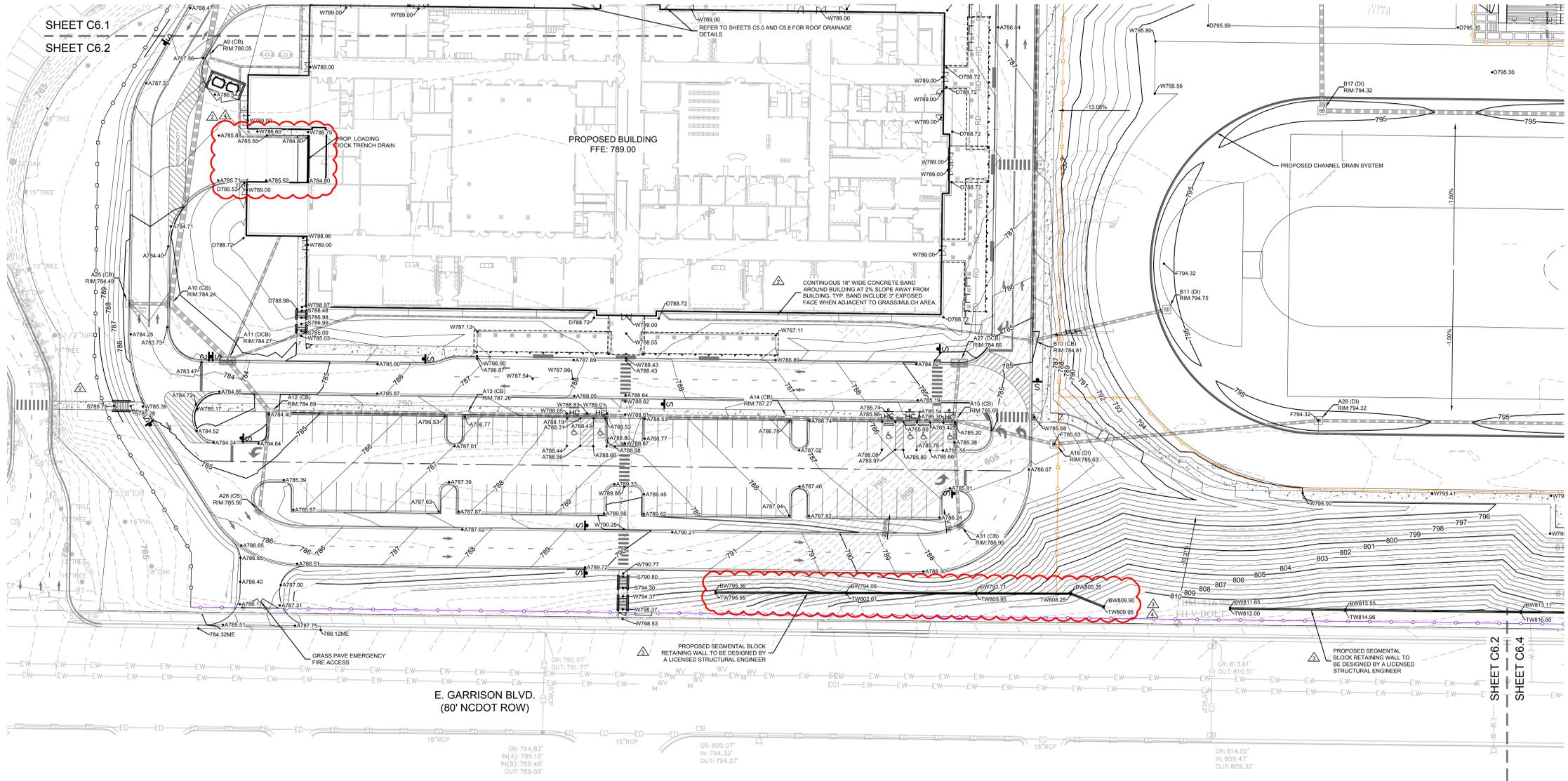
**STANDARD GRADING PLAN NOTES**

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- REFER TO THE "SPOT ELEVATION KEY" FOR INFORMATION ON SPOT ELEVATIONS.
- COORDINATE WITH THE OWNER AND THE PROJECT GEOTECHNICAL CONSULTANT FOR LOT FILL COMPACTION AND TESTING REQUIREMENTS.
- CONTRACTOR TO SELF-VERIFY THAT SITE GRADES, PONDS, POND DIKES, DRAINAGE PIPES, AND DRAINAGE STRUCTURES ARE CONSTRUCTED PER THE PLANS PRIOR TO REQUESTING FINAL AS-BUILT SURVEY FROM SURVEYOR.

**SPOT ELEV KEY (FINISHED GRADING)**

- A-(ASPHALT) SURFACE OF FINISHED ASPHALT ROADWAY OR WALKING PATH
- C-(CONCRETE) CONCRETE PAVING
- D-(DIRT) FINISHED GROUND ELEVATION
- F-FLOW ELEVATION AT WHICH SURFACE WATER FLOWS INTO DRAINAGE STRUCTURE
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- W-(WALK) SURFACE OF FINISHED CONCRETE OR INTERLOCKING PAVEMENT SIDEWALK, PATIO, PLAZA, OR SLAB
- TC- TOP OF CURB ELEVATION
- BC- BOTTOM OF CURB ELEVATION
- TS- TOP OF STAIRS ELEVATION
- BS- BOTTOM OF STAIRS ELEVATION
- TW- FINISHED GRADE ELEVATION AT TOP OF WALL
- BW- FINISHED GRADE ELEVATION AT BOTTOM OF WALL
- ME-(MATCH EXISTING) FOLLOWING ELEVATION NUMBER - INDICATES TO MATCH ELEVATION OF EXISTING SURFACE AT POINT OF CONNECTION

EXAMPLE: A12.56ME MEANS THAT THE SURFACE OF NEW ASPHALT IS TO BE AT ELEVATION 12.56 WHICH SHOULD MATCH THE ELEVATION OF THE EXISTING ASPHALT SURFACE AT THE JOINT



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW SEAMONWHITESIDE**  
 MOUNT PLEASANT, SC 843.884.1667  
 GREENVILLE, SC 864.296.0534  
 SUMMERVILLE, SC 843.972.0710  
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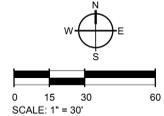
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REVISIONS:

No.	Description	Date
2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
 DATE: 01-12-2023  
 DRAWN BY: MEM  
 CHECKED BY: TNC

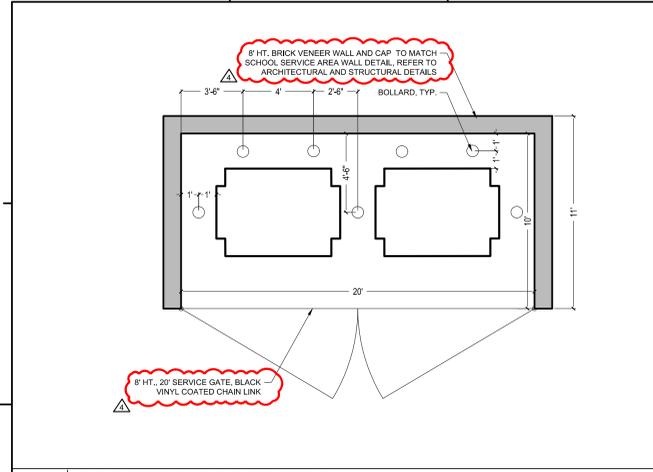
**ENLARGED GRADING PLAN**  
**C6.2**



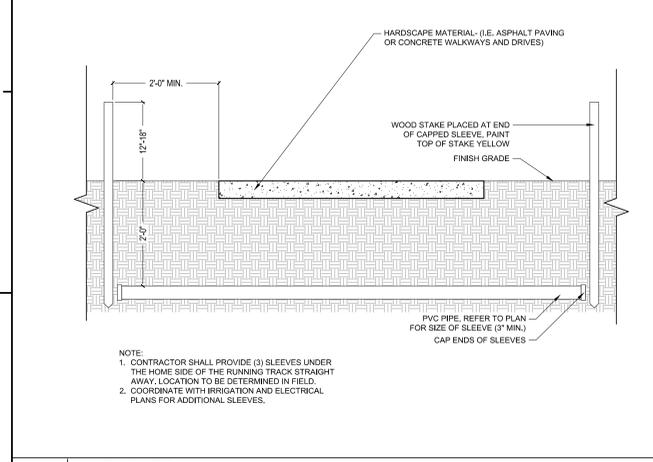
**REVISIONS:**

No.	Description	Date
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2	ADDENDUM 1	01.31.2023
3	ADDENDUM 2	02.07.2023
4	ADDENDUM 3	02.14.2023

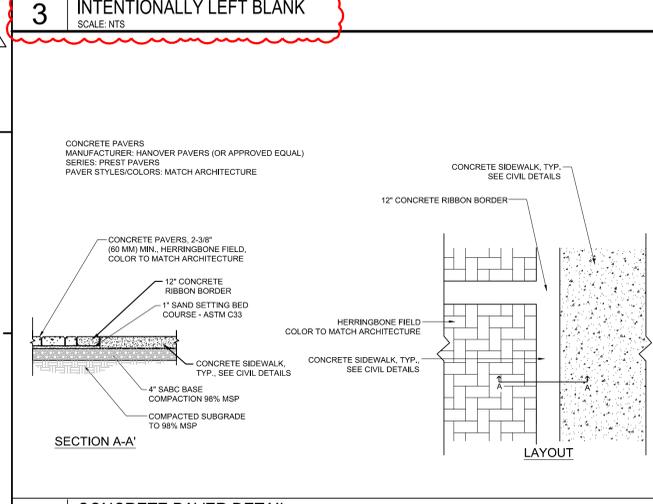
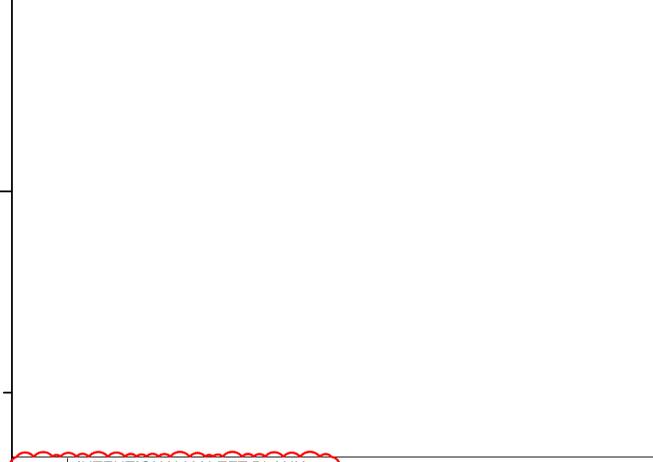
**PROJECT:** CL1253  
**DATE:** 01-12-2023  
**DRAWN BY:** MEM  
**CHECKED BY:** TNC



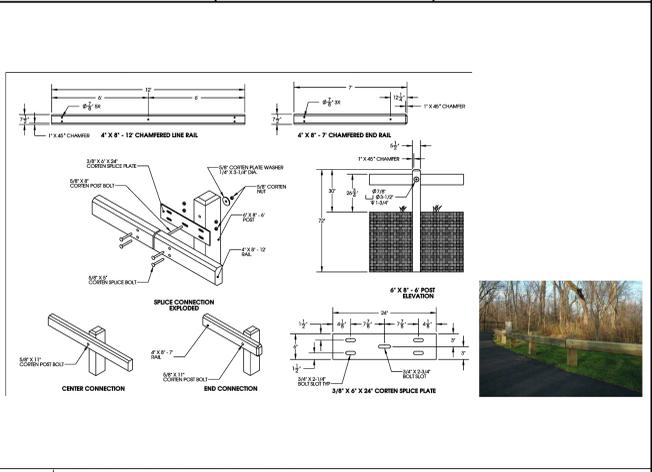
**1 DUMPSTER ENCLOSURE DETAIL**  
SCALE: NTS



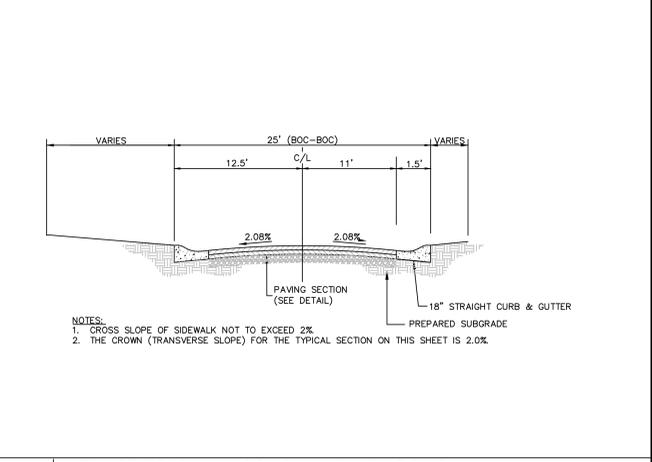
**2 SLEEVE DETAIL**  
SCALE: NTS



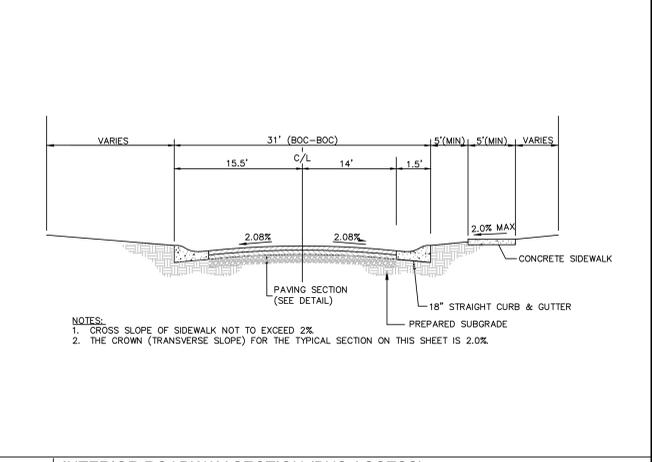
**4 CONCRETE PAVER DETAIL**  
SCALE: 1/2\"/>



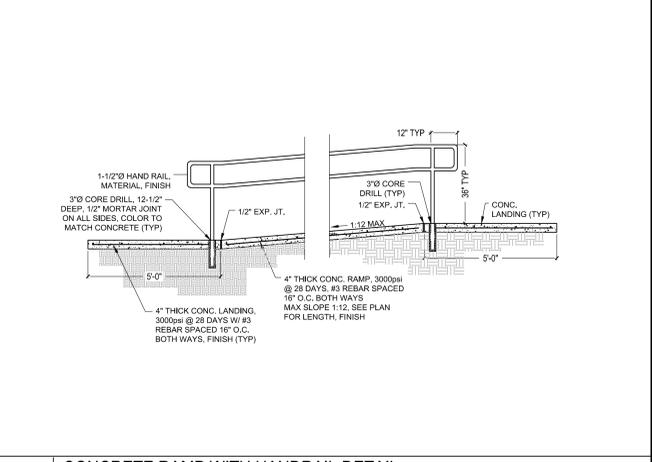
**5 VEHICULAR TIMBER GUARDRAIL**  
SCALE: NTS



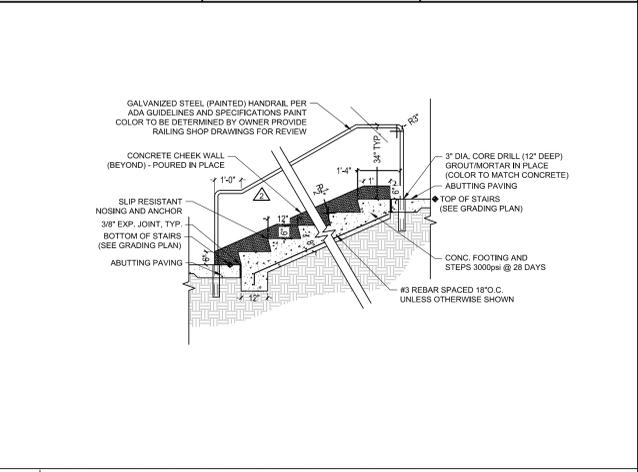
**6 INTERIOR ROADWAY SECTION (PARENT DROP-OFF)**  
SCALE: NTS



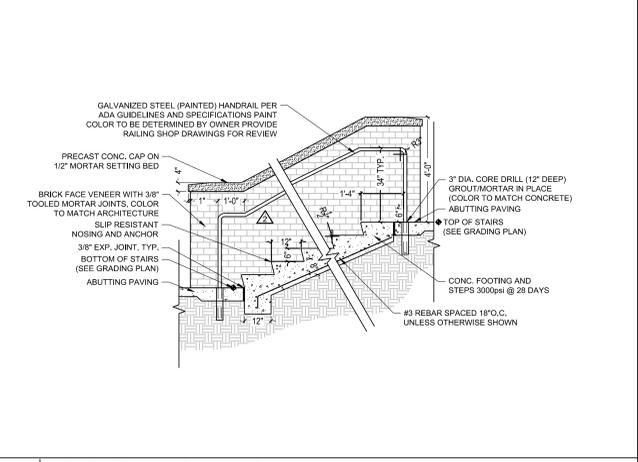
**7 INTERIOR ROADWAY SECTION (BUS ACCESS)**  
SCALE: NTS



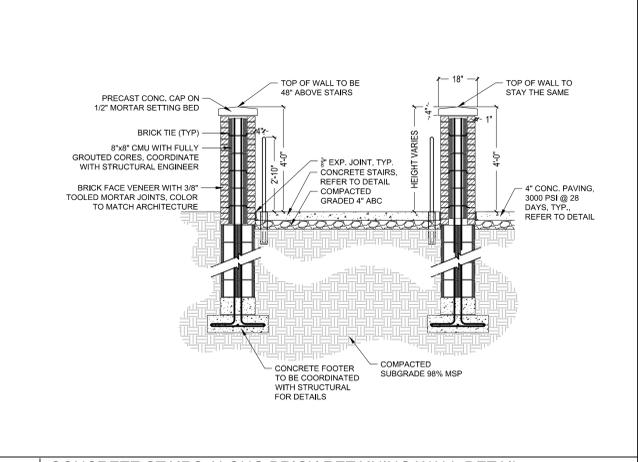
**8 CONCRETE RAMP WITH HANDRAIL DETAIL**  
SCALE: NTS



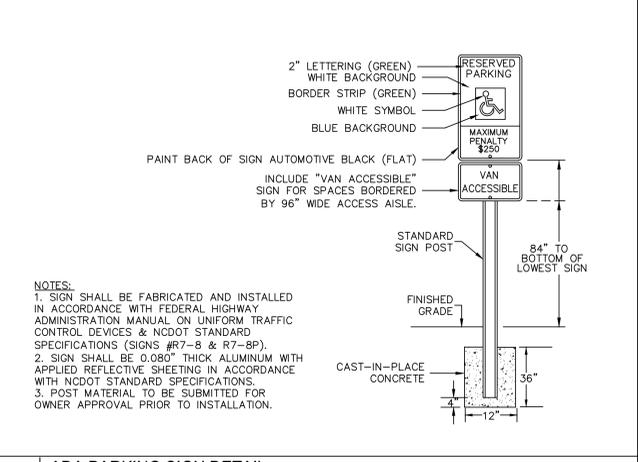
**9 CONCRETE STAIRS WITH CHEEK WALL DETAIL**  
SCALE: 1/2\"/>



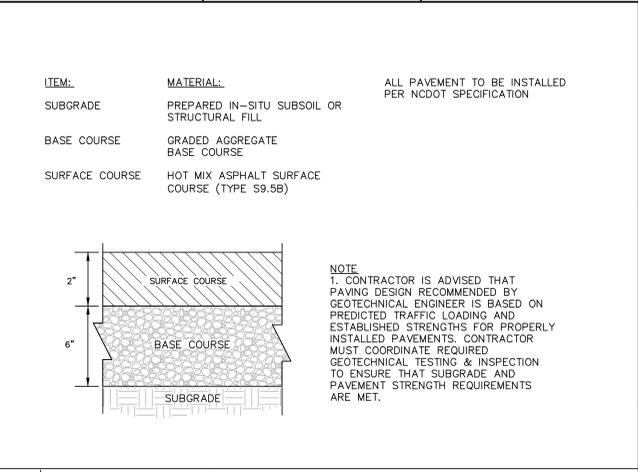
**10 CONCRETE STAIRS WITH BRICK WALL DETAIL**  
SCALE: NTS



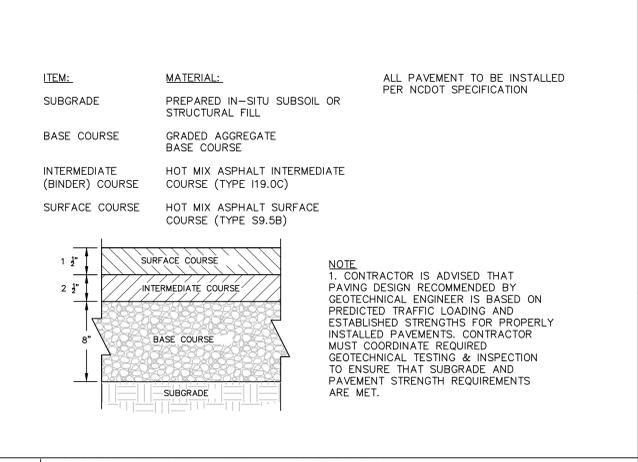
**11 CONCRETE STAIRS ALONG BRICK RETAINING WALL DETAIL**  
SCALE: NTS



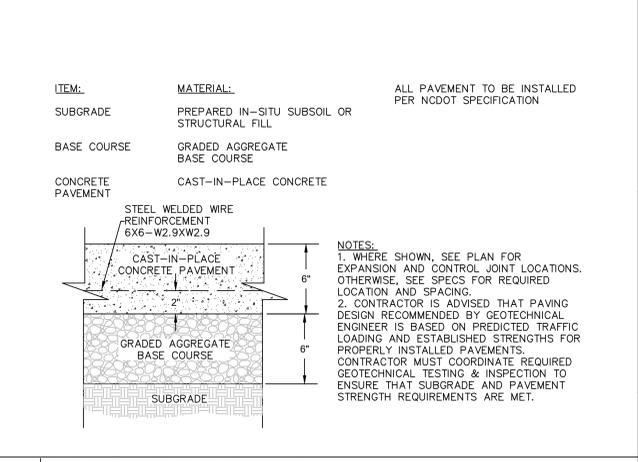
**12 ADA PARKING SIGN DETAIL**  
SCALE: NTS



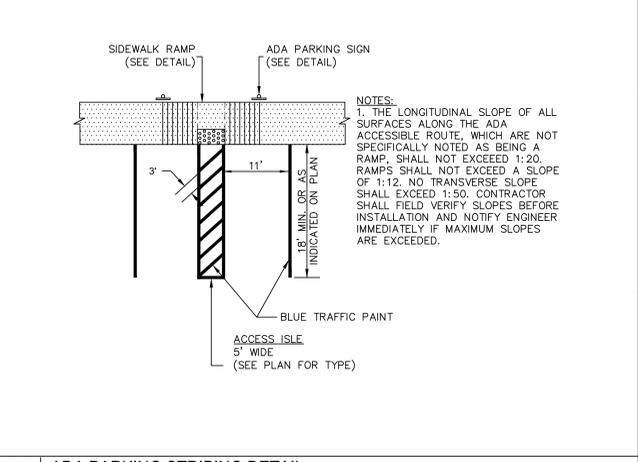
**13 STANDARD ASPHALT PAVING SECTION**  
SCALE: 3/4\"/>



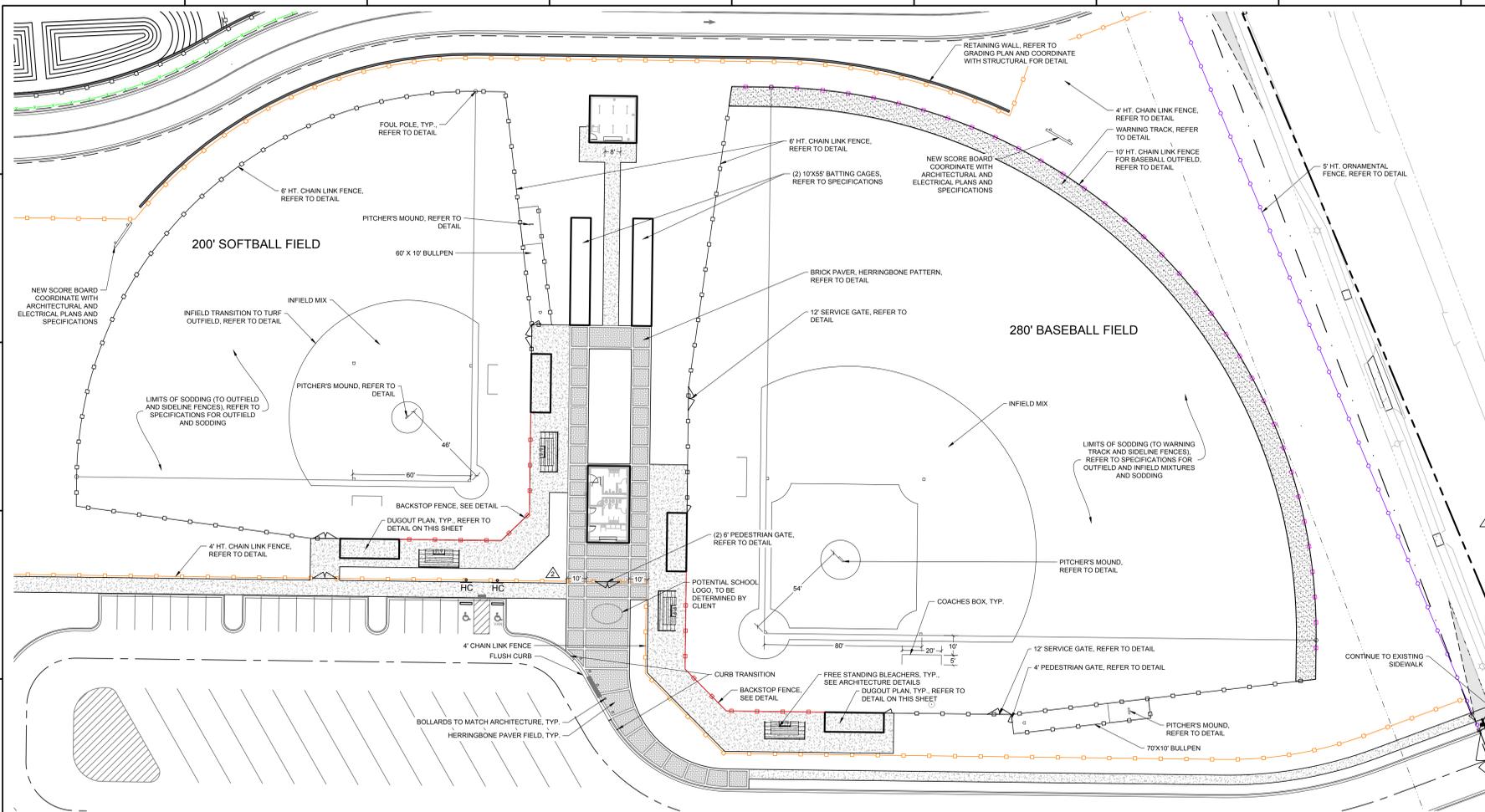
**14 HEAVY DUTY ASPHALT PAVING SECTION**  
SCALE: NTS



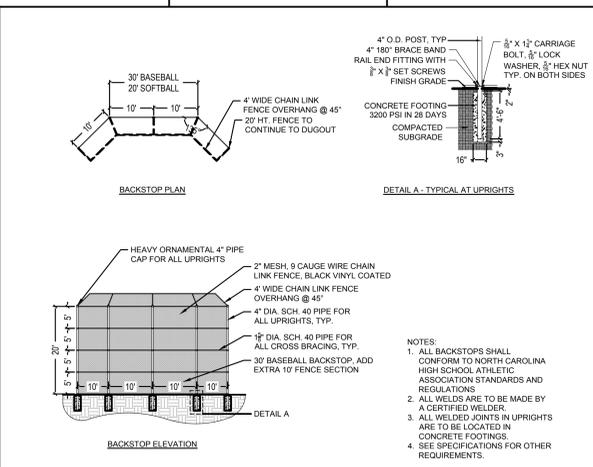
**15 CONCRETE PAVEMENT SECTION**  
SCALE: NTS



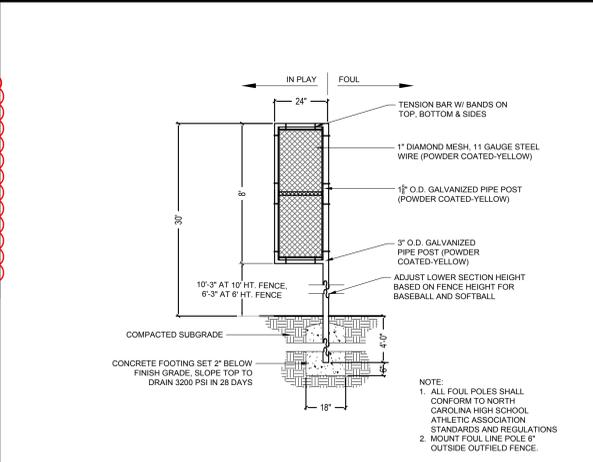
**16 ADA PARKING STRIPING DETAIL**  
SCALE: NTS



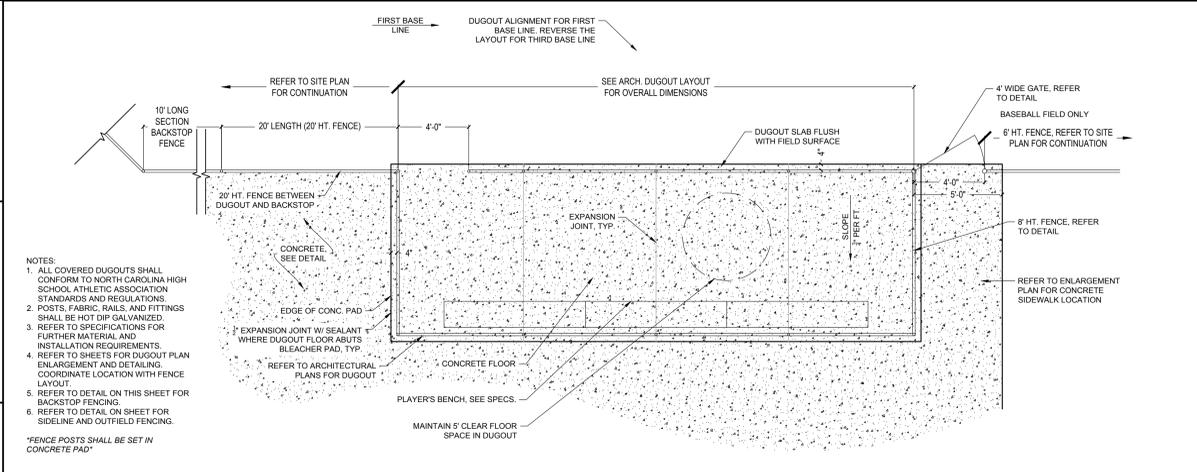
**1 BASEBALL AND SOFTBALL FIELD ENLARGEMENT**  
SCALE: 1"=30'



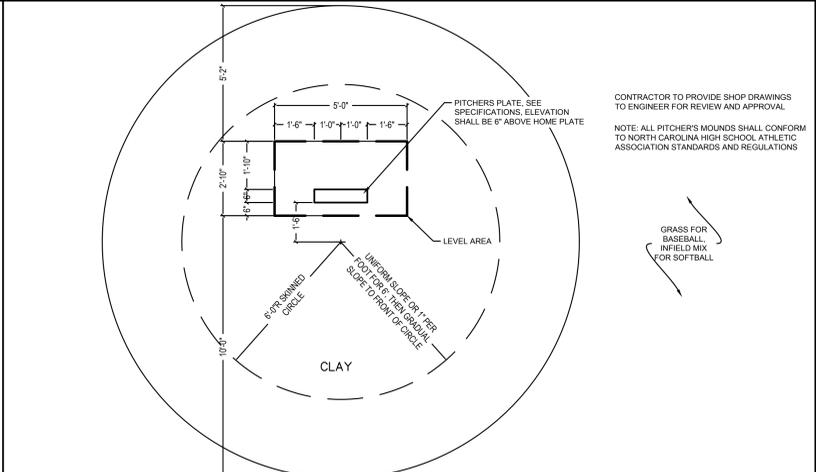
**7 BALLFIELD BACKSTOP FENCE DETAIL**  
SCALE: 1/16"=1'-0"



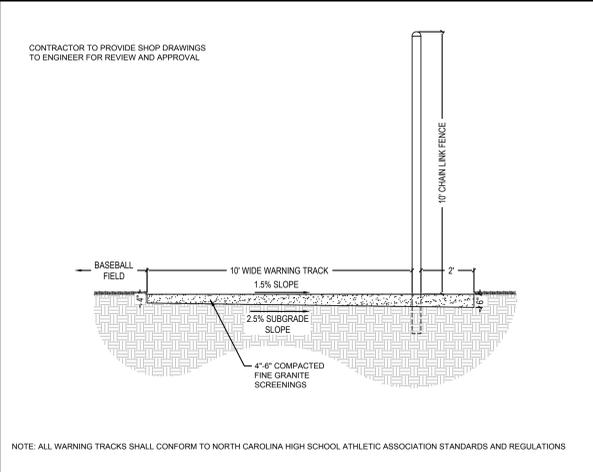
**8 FOUL POLE DETAIL**  
SCALE: 1/4"=1'-0"



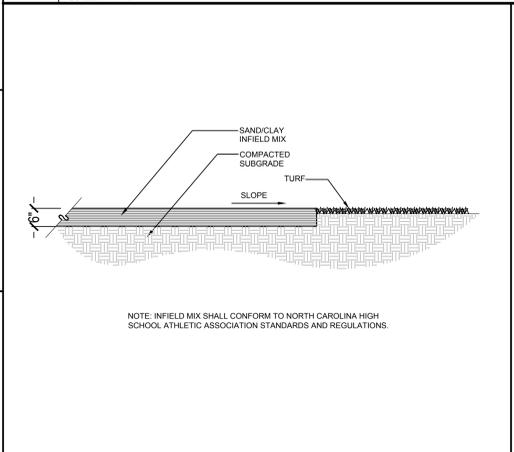
**2 COVERED DUGOUT PLAN ENLARGEMENT**  
SCALE: 1/4"=1'-0"



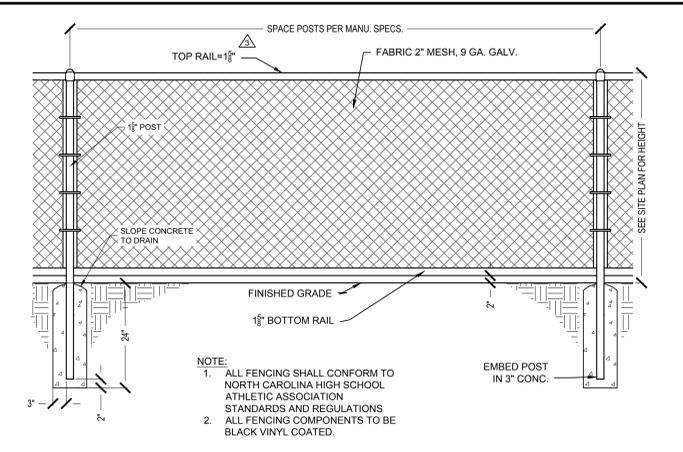
**5 PITCHER'S MOUND DETAIL**  
SCALE: 1"=1'-0"



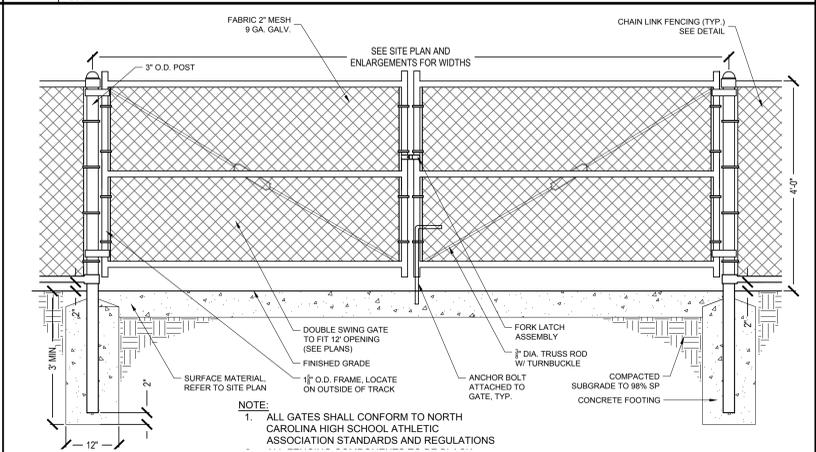
**9 BASEBALL FIELD WARNING TRACK**  
SCALE: 3/8"=1'-0"



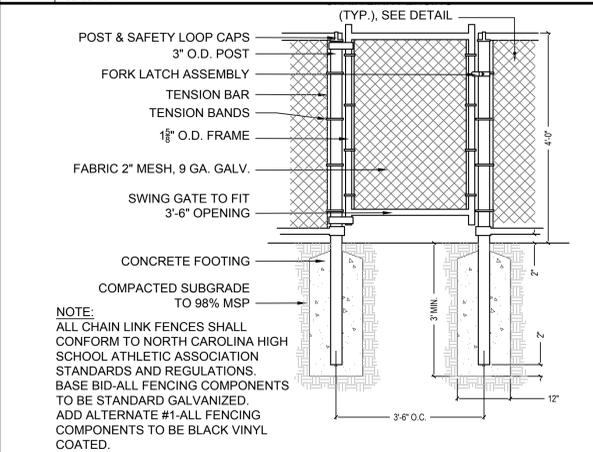
**3 EDGE OF SKINNED INFELD TO TURF OUTFIELD**  
SCALE: 3/4"=1'-0"



**4 CHAIN LINK FENCE DETAIL**  
SCALE: 3/4"=1'-0"



**6 SERVICE GATE**  
SCALE: 3/4"=1'-0"



**10 CHAIN LINK PEDESTRIAN GATE**  
SCALE: 3/4"=1'-0"



**GRIER MIDDLE SCHOOL REPLACEMENT**

**SW SEAMONWHITESIDE**

MOUNT PLEASANT, SC 843.884.1667  
GREENVILLE, SC 864.296.0534  
SUMMERVILLE, SC 843.972.0710  
SPARTANBURG, SC 864.272.1272  
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**REVISIONS:**

No.	Description	Date
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: MEM  
CHECKED BY: TNC

**SITE DETAILS**

**C7.3**

BUFFER "A" - GARRISON BOULEVARD (1,269 LF)			
MINIMUM BUFFER WIDTH	TYPE B BUFFER	PLANTINGS REQUIRED	PLANTINGS PROVIDED
	10' MIN.		
CANOPY TREE	4"	51	51+
UNDERSTORY TREE	4"	51	51+
SHRUBS	35"	445	445+

\*ALL PLANT COUNTS ARE FOR 100' SECTION.

BUFFER "B" - BURTONWOOD DRIVE (1,023 LF)			
MINIMUM BUFFER WIDTH	TYPE B BUFFER	PLANTINGS REQUIRED	PLANTINGS PROVIDED
	10' MIN.		
CANOPY TREE	4"	41	41+
UNDERSTORY TREE	4"	41	41+
SHRUBS	35"	358	358+

\*ALL PLANT COUNTS ARE FOR 100' SECTION.

BUFFER "C" - INTERIOR PROPERTY LINE (1,957 LF)			
MINIMUM BUFFER WIDTH	TYPE B BUFFER	PLANTINGS REQUIRED	PLANTINGS PROVIDED
	10' MIN.		
CANOPY TREE	4"	79	13**
UNDERSTORY TREE	4"	79	17**
SHRUBS	35"	685	136**

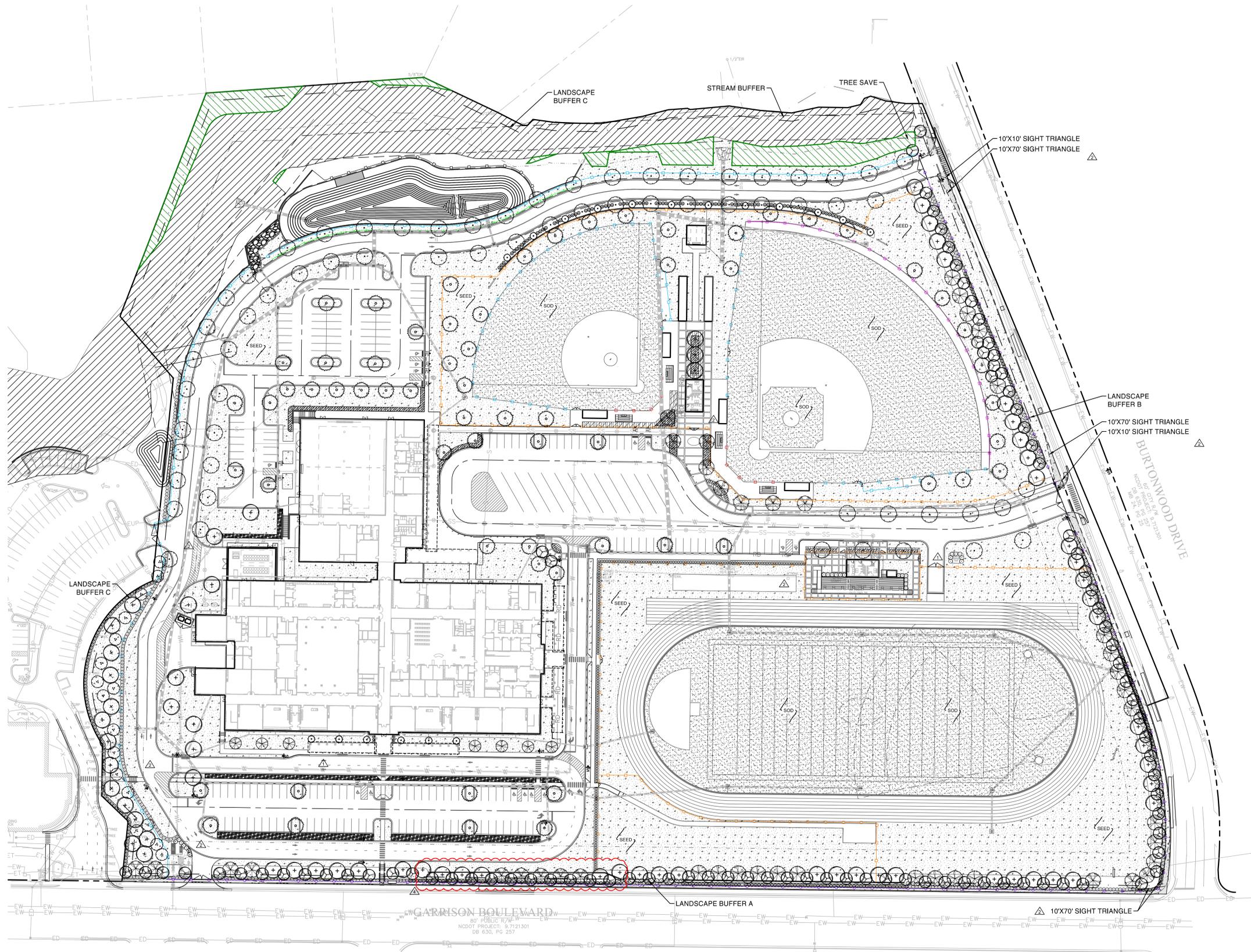
\*ALL PLANT COUNTS ARE FOR 100' SECTION.  
\*\*EXISTING VEGETATION TO SATISFY BUFFER REQUIREMENTS

PLANT SCHEDULE ENHANCED LANDSCAPE		
TREES	CODE	BOTANICAL / COMMON NAME
	LRT	Liriodendron tulipifera / Tulip Poplar
	MAGG	Magnolia grandiflora / Southern Magnolia
	QVEV	Quercus virginiana / Southern Live Oak
	QUPH	Quercus phellos / Willow Oak
	ULMP	Ulmus parvifolia / Chinese Elm
UNDERSTORY TREES		
CODE	BOTANICAL / COMMON NAME	
	ACEB	Acer buergerianum / Trident Maple
	CERC	Cercis canadensis / Eastern Redbud
	CORF	Cornus florida / Eastern Dogwood
	ILAS	Ilex x attenuata 'Savannah' / Savannah Holly
SHRUBS		
CODE	BOTANICAL / COMMON NAME	
	AZAE	Azalea Encore 'Autumn Sunset' TM / Encore Azalea
	AZAF	Azalea indica 'Formosa' / Formosa Azalea
	AZGT	Azalea indica 'George Tabor' / George Tabor Azalea
	ILCB	Ilex cornuta 'Burfordii Nana' / Dwarf Burford Holly
	VIBS	Viburnum suspensum / Sandankwa Viburnum
GRASSES		
CODE	BOTANICAL / COMMON NAME	
	FENS	Pennisetum setaceum / Purple Fountain Grass
SHRUB AREAS		
CODE	BOTANICAL / COMMON NAME	
	MULH-2	Muhlenbergia filipes / Sweetgrass
	PANV-2	Panicum virgatum 'Heavy Metal' / Heavy Metal Switch Grass
GROUND COVERS		
CODE	BOTANICAL / COMMON NAME	
	ANNS	Annals Varies / Annuals
	LMBB	Liriope muscari 'Big Blue' / Big Blue Lilyturf
SOD/SEED		
CODE	BOTANICAL / COMMON NAME	
	SEED	Cynodon dactylon 'Turf' / Turf Bermuda Seed
	S002	Cynodon dactylon 'Turf' / Turf Bermuda Grass

UNDISTURBED TREE SAVE AREA

ALL CANOPY TREES AND UNDERSTORY TREES NOT LOCATED IN MULCHED AREA TO HAVE 5' DIAMETER MULCH RING

NOTES:  
1. ALL DISTURBED AREAS NOT BEING SODDED/SEEDED SHALL BE MULCHED.



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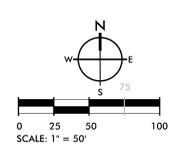
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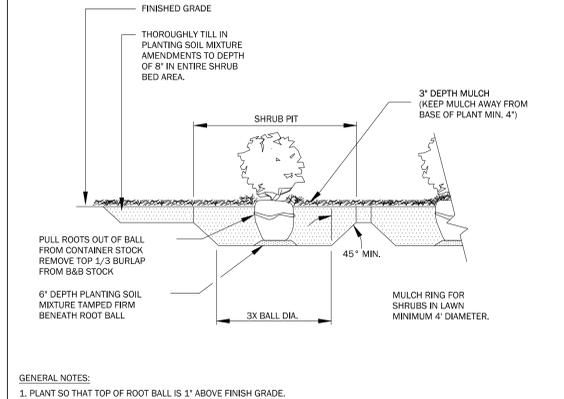
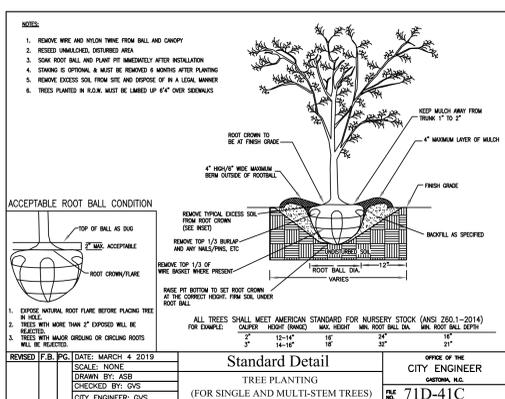
REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11.11.2022
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: MEM  
CHECKED BY: TNC

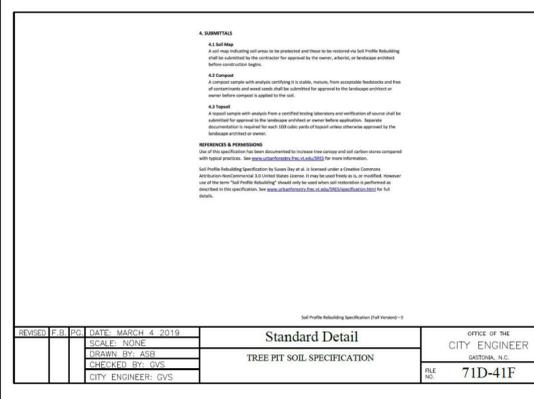
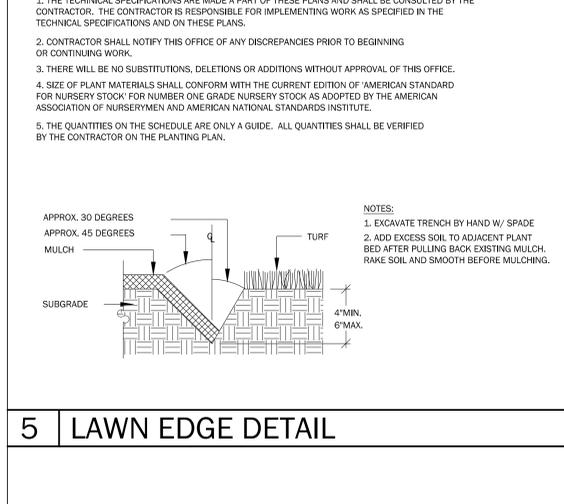
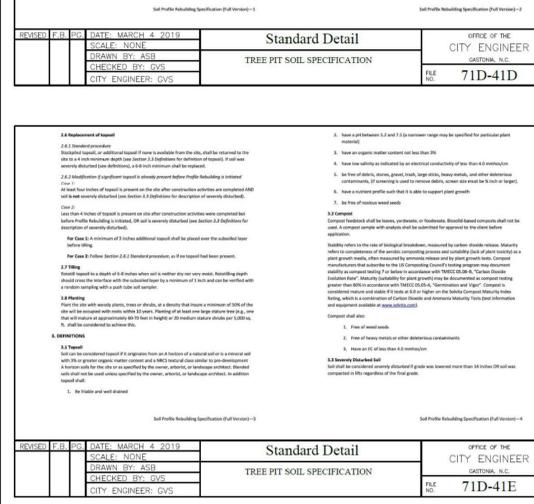
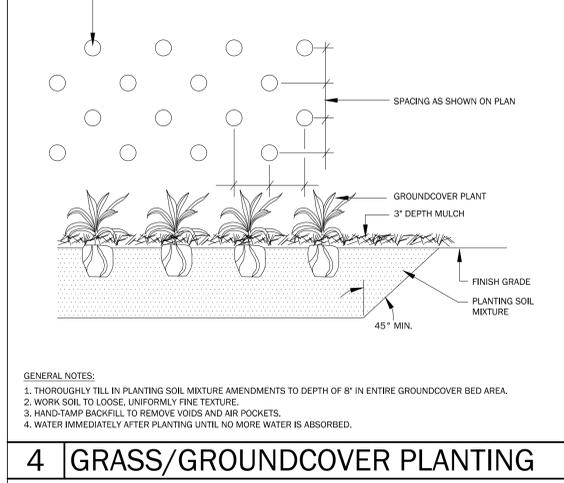
**LANDSCAPE PLAN**  
**L1.0**





**1 TYPICAL TREE PLANTING**

**3 TYPICAL SHRUB PLANTING**



**IRRIGATION NOTES**

1. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF PROPOSED IRRIGATION SYSTEM TO LANDSCAPE ARCHITECT AND OWNER FOR ACCEPTANCE. CONTRACTOR TO SUPPLY AUTOMATIC IRRIGATION SYSTEMS, COMPLETE AND INSTALLED, SYSTEM TO INCLUDE ALL VALVES, PIPES, HEADS, FITTINGS, RAIN SENSOR, AND CLOCK AND TO PROVIDE 100% COVERAGE OF ALL NEW SODDED AND IMPROVED EXISTING GRASS AREAS, TREES, SHRUBS AND PLANTING BEDS. COORDINATE IRRIGATION WITH OWNER'S REPRESENTATIVE.
2. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR AUTOMATIC IRRIGATION SYSTEMS. CONTRACTOR SHALL PROVIDE ELECTRIC METER AND SERVICE IN ACCORDANCE WITH STATE AND LOCAL CODES FOR IRRIGATION SYSTEMS. LOCATION OF METERS AND CONTROL PANELS FOR IRRIGATION SHALL BE APPROVED BY OWNER'S REP. PRIOR TO INSTALLATION. COORDINATE WATER METER REQUIREMENTS WITH CIVIL ENGINEER.

**GENERAL PLANTING NOTES**

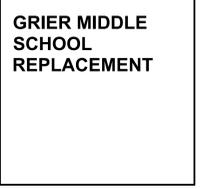
1. REQUIREMENTS FOR THE MEASUREMENTS, BRANCHING, GRADING, QUALITY, BALLING AND BURLAPPING OF PLANTS IN THE PLANT LIST SHOULD FOLLOW OR EXCEED THE STANDARDS CURRENTLY RECOMMENDED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. IN THE AMERICAN STANDARD FOR NURSERY STOCK (ASNS). UNLESS OTHERWISE SPECIFIED, ANY SIZE SPECIFIED SHALL BE CONSIDERED MINIMUM. MINIMUMS FOR HEIGHT, SPREAD, OR CALIPER SHALL TAKE PRECEDENCE OVER A SPECIFIED CONTAINER SIZE.
2. ALL PLANTS SHALL HAVE A WELL FORMED HEAD WITH MINIMUM CALIPER, HEIGHT AND SPREAD OF THE SIDE BRANCHES AS SHOWN ON THE PLANT LIST. TRUNKS SHALL BE UNDamAGED AND SHAPE SHALL BE TYPICAL OF THE SPECIES.
3. MEASUREMENT OF CONIFER HEIGHT SHALL INCLUDE NOT MORE THAN FIFTY (50) PER CENT OF THIS YEAR'S VERTICAL GROWTH (TOP CANDLE).
4. THE LANDSCAPE CONTRACTOR IS HEREBY NOTIFIED OF THE EXISTENCE OF UNDERGROUND UTILITIES WITHIN THE LIMITS OF THE PROJECT AREA. THE CONTRACTOR SHOULD VERIFY THE EXACT LOCATION OF ALL UTILITY LINES PRIOR TO COMMENCEMENT OF DIGGING OPERATIONS. CONTRACTOR RESPONSIBLE FOR LOCATING, PROTECTING, AND REPAIRING ALL DAMAGE TO BUILDINGS, UTILITIES, PAVEMENT, AND CURB & GUTTER. ANY REPAIRS SHALL BE DONE PROMPTLY AT CONTRACTOR'S EXPENSE.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR STAKING AND LAYOUT OF PLANTINGS ON THIS PROJECT. THE LANDSCAPE ARCHITECT OR OWNER SHALL BE ADVISED WHEN STAKES ARE READY FOR INSPECTION ON VARIOUS PLANTING AREAS. ALL LAYOUT WORK SHALL BE INSPECTED AND APPROVED BY THE LANDSCAPE ARCHITECT AND OWNER PRIOR TO INSTALLING ANY PLANTING PITS.
6. IT IS THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO VERIFY THAT EACH EXCAVATED TREE OR SHRUB PIT WILL PERCOLATE (DRAIN) FROM TOPSOIL AND INSTALLING TREES OR SHRUBS. THE CONTRACTOR SHALL FILL THE BOTTOM OF HOLES WITH SIX (6) INCHES OF WATER. THIS WATER SHOULD PERCOLATE WITHIN A TWENTY-FOUR (24) HOUR PERIOD. IF WATER DOESN'T PERC, CONTRACTOR SHALL NOTIFY THE OWNER'S REP PRIOR TO INSTALLING PLANTS.
7. SHOULD THE LANDSCAPE CONTRACTOR ENCOUNTER UNSATISFACTORY SURFACE OR SUBSURFACE DRAINAGE CONDITIONS, SOIL DEPTH, LATENT SOILS, HARD PANS, STEAM OR OTHER UTILITY LINES OR OTHER CONDITIONS THAT WILL IMPROVE THE HEALTH AND VIGOR OF THE PLANTS, HE MUST ADVISE THE LANDSCAPE ARCHITECT IN WRITING OF THE CONDITIONS PRIOR TO INSTALLING THE PLANTS. OTHERWISE, THE LANDSCAPE CONTRACTOR WARRANTS THAT THE PLANTING AREAS ARE SUITABLE FOR PROPER GROWTH AND DEVELOPMENT OF THE PLANTS TO BE INSTALLED.
8. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING UP THE SITE AT THE COMPLETION OF THE PROJECT AND SHALL MAINTAIN THE SITE IN A REASONABLY NEAT AND CLEAN STATE THROUGHOUT THE INSTALLATION PROCESS. STREETS AND PAVED AREAS SHALL BE CLEANED REGULARLY TO REMOVE CONSTRUCTION MATERIALS AND OTHER DEBRIS RESULTING FROM WORK OF THE PROJECT.

**REPLACEMENTS OF DEAD OR UNSATISFACTORY MATERIAL SHALL BE MADE AS SPECIFIED IN THE PLANT LIST. THE OWNER OR LANDSCAPE ARCHITECT SHALL INSPECT REPLACED PLANTS WHEN ALL REPLACEMENTS HAVE BEEN MADE. REPLACEMENTS ARE TO BE ALIVE AND IN A HEALTHY CONDITION WHEN THE REPLACEMENTS ARE COMPLETE. REPLACEMENTS ARE NOT SUBJECT TO AN ADDITIONAL GUARANTEE, BUT THE LANDSCAPE CONTRACTOR SHALL CONSULT WITH THE LANDSCAPE ARCHITECT ON REASON FOR PLANT DECLINE/DEATH AND HOW TO AVOID FUTURE INSTANCES.**

10. SHOULD THE CONTRACTOR NOT MAKE REPLACEMENTS IN A SATISFACTORY AND TIMELY FASHION IN ACCORD WITH THE PLANTING NOTES, THE OWNER, AFTER PROPER NOTIFICATION TO THE CONTRACTOR MAY UTILIZE THE FUNDS OF THE RESERVE TO HAVE THE REPLACEMENTS MADE IN ACCORDANCE WITH THE SPECIFICATIONS BY ANOTHER CONTRACTOR.
11. NO EXCAVATION OR PLANTING PIT SHALL BE LEFT UNATTENDED OVERNIGHT.
12. PLANT MATERIAL QUANTITIES PROVIDED IN THE PLANT LIST ARE FOR REFERENCE ONLY AND THE CONTRACTOR IS RESPONSIBLE FOR THE ACTUAL PLANT MATERIAL QUANTITIES. DISCREPANCIES BETWEEN QUANTITIES SHOWN ON THE PLANTING PLAN AND THOSE IN THE PLANT LIST SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. IF CLARIFICATION OF DISCREPANCIES FROM THE LANDSCAPE ARCHITECT IS NOT POSSIBLE, THEN QUANTITIES SHOWN ON THE PLANTING PLAN SHALL TAKE PRECEDENCE.
13. REMOVE BURLAP/STRAPPING AND WIRE BASKET FROM TOP 1/3 OF ROOT BALL ON TREES.
14. REMOVE PAPER, PLASTIC OR METAL AROUND ROOT BALLS OF SHRUBS.
15. DO NOT WRAP TREES.
16. WATER ALL PLANT MATERIAL IMMEDIATELY AFTER PLANTING.
17. TREE GIVING MATERIAL SHALL BE "ARBOR-TITE" OR EQUIVALENT.
18. ALL PLANT BEDS TO BE MULCHED WITH 3" OF DOUBLE SHREDED HARDWOOD MULCH UNLESS OTHERWISE SPECIFIED.
19. ALL AREAS OF PLANTING, INCLUDING AREAS OF GRASS SEEDING AND SOD, SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AND SHALL BE PROVIDED APPROPRIATE SOIL FOR THE PROPOSED PLANTINGS.
20. ALL EXISTING VEGETATION WITHIN AREAS TO BE PLANTED, SODDED AND/OR SEEDED SHALL BE REMOVED PRIOR TO PLANTING, SODDING, AND SEEDING. ALL AREAS INDICATED TO BE GRASS SEED SHALL BE SEED PER GRASSING SPECIFICATIONS FOR PERMANENT STABILIZATION.

FWF	FULL WELL FORMED	MS	MULTI-STEMMED TRUNK	EGG	EGG CAN CONTAINER	CON	CONTAINERIZED MATERIAL	MH	MATCHING HEIGHTS
SP	SPECIMEN MATERIAL	CL	TRUNK CALIPER	B&B	BALLED AND BURLAPPED MATERIAL	BR	BARE ROOT MATERIAL	RF	REFOLIATED
TF	TREE FORM HABIT	GAL	GALLON CONTAINER			ESP	ESPALIER	HC	HURRICANE CUT

PLANT SCHEDULE ENHANCED LANDSCAPE										
TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	LIRT	23	Liriodendron tulipifera / Tulip Poplar	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	MAGG	20	Magnolia grandiflora / Southern Magnolia	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	QUEV	71	Quercus virginiana / Southern Live Oak	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	QUPH	63	Quercus phellos / Willow Oak	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	ULMP	64	Ulmus parvifolia / Chinese Elm	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
UNDERSTORY TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	ACEB	7	Acer buergerianum / Trident Maple	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	CERC	92	Cercis canadensis / Eastern Redbud	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	CORF	17	Cornus florida / Eastern Dogwood	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
	ILAS	19	Ilex x attenuata 'Savannah' / Savannah Holly	2" CAL	10' MIN	6'-8"	AS SHOWN	FWF, SP		
SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	AZAE	204	Azalea Encore 'Autumn Sunset'™ / Encore Azalea	3 GAL	18"-24"	18"-24"	AS SHOWN	FWF, SP		
	AZAF	438	Azalea indica 'Formosa' / Formosa Azalea	3 GAL	18"-24"	18"-24"	AS SHOWN	FWF, SP		
	AZGT	304	Azalea indica 'George Tabor' / George Tabor Azalea	3 GAL	18"-24"	18"-24"	AS SHOWN	FWF, SP		
	ILCB	102	Ilex cornuta 'Burfordii Nana' / Dwarf Burford Holly	3 GAL	18"-24"	18"-24"	AS SHOWN	FWF, SP		
	VIBS	133	Viburnum suspensum / Sandankwa Viburnum	3 GAL	18"-24"	18"-24"	AS SHOWN	FWF, SP		
GRASSES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	PENS	6	Pennisetum setaceum / Purple Fountain Grass	1 GAL	8"-12"	8"-12"	AS SHOWN	FWF, SP		
SHRUB AREAS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	MUHL-2	385	Muhlenbergia filipes / Sweetgrass	1 GAL				FWF, SP		
	PANV-2	5,776 sf	Panicum virgatum 'Heavy Metal' / Heavy Metal Switch Grass	1 GAL				FWF		
GROUND COVERS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	ANNS	128 sf	Annuals Varies / Annuals	4" POT	TBD	N/A	N/A	Contractor to determine at time of planting		
	LMBB	1,653	Liriope muscari 'Big Blue' / Big Blue Lilyturf	4" POT	8"-12"	8"-12"	24"	FWF, SP		
SOD/SEED	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS		
	SEED	351,751 sf	Cynodon dactylon 'TifTuf' / TifTuf Bermuda Seed	SEED	N/A	N/A	N/A	SP		
	SOD2	192,991 sf	Cynodon dactylon 'TifTuf' / TifTuf Bermuda Grass	SOD	N/A	N/A	N/A	SP		



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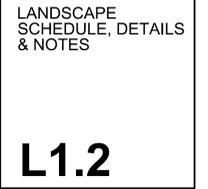


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**REVISIONS:**

No.	Description	Date
1	AGENCY REVIEW	11.11.2022
2	ADDENDUM 1	01.31.2023
4	ADDENDUM 3	02.14.2023

PROJECT: CL1253  
DATE: 01-12-2023  
DRAWN BY: TMC  
CHECKED BY: NEM





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303 EAST FRANKLIN STREET, SUITE A  
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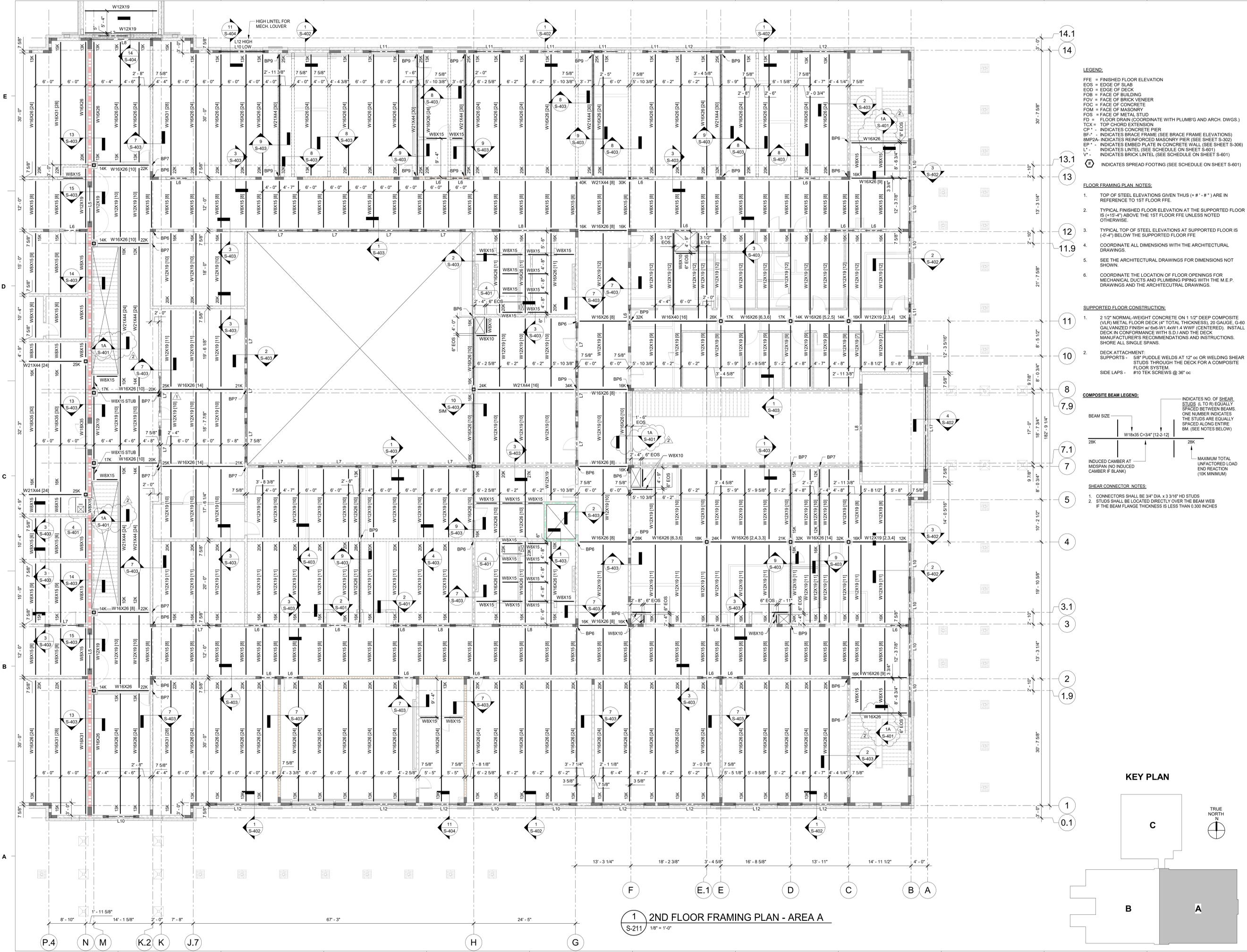
REVISIONS:

No.	Description	Date
1	ADDENDUM 2	02.07.2023
2	ADDENDUM 3	02.14.2023

PROJECT: 9201-216240  
 DATE: 01-12-2023

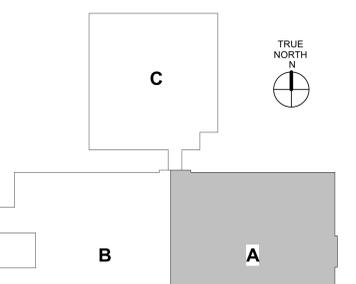
2ND FLOOR FRAMING PLAN - AREA A

S-211



- LEGEND:**
- FFE = FINISHED FLOOR ELEVATION
  - EOS = EDGE OF SLAB
  - EOD = EDGE OF DECK
  - FOB = FACE OF BUILDING
  - FVB = FACE OF BRICK VENEER
  - FCC = FACE OF CONCRETE
  - FOM = FACE OF MASONRY
  - FOS = FACE OF METAL STUD
  - FD = FLOOR DRAIN (COORDINATE WITH PLUMB'G AND ARCH. DWGS.)
  - TCX = TOP CHORD EXTENSION
  - CS\* = INDICATES CONCRETE PIER
  - BF\* = INDICATES BRACE FRAME (SEE BRACE FRAME ELEVATIONS)
  - BM2PA = INDICATES REINFORCED MASONRY PIER (SEE SHEET S-302)
  - EP\* = INDICATES EMBED PLATE IN CONCRETE WALL (SEE SHEET S-306)
  - L\* = INDICATES LINTEL (SEE SCHEDULE ON SHEET S-601)
  - V\* = INDICATES BRICK LINTEL (SEE SCHEDULE ON SHEET S-601)
  - Ⓣ = INDICATES SPREAD FOOTING (SEE SCHEDULE ON SHEET S-601)
- FLOOR FRAMING PLAN NOTES:**
- TOP OF STEEL ELEVATIONS GIVEN THUS (+ #'-#") ARE IN REFERENCE TO 1ST FLOOR FFE.
  - TYPICAL FINISHED FLOOR ELEVATION AT THE SUPPORTED FLOOR IS (+15'-4") ABOVE THE 1ST FLOOR FFE UNLESS NOTED OTHERWISE.
  - TYPICAL TOP OF STEEL ELEVATIONS AT SUPPORTED FLOOR IS (-0'-4") BELOW THE SUPPORTED FLOOR FFE.
  - COORDINATE ALL DIMENSIONS WITH THE ARCHITECTURAL DRAWINGS.
  - SEE THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN.
  - COORDINATE THE LOCATION OF FLOOR OPENINGS FOR MECHANICAL DUCTS AND PLUMBING PIPING WITH THE M.E.P. DRAWINGS AND THE ARCHITECTURAL DRAWINGS.
- SUPPORTED FLOOR CONSTRUCTION:**
- 2 1/2" NORMAL WEIGHT CONCRETE ON 1 1/2" DEEP COMPOSITE (VLR) METAL FLOOR DECK (4" TOTAL THICKNESS), 20 GAUGE, G-60 GALVANIZED FINISH w/ 6x6-W1.4xW1.4 WVF (CENTERED). INSTALL DECK IN CONFORMANCE WITH S.D.I. AND THE DECK MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. SHORE ALL SINGLE SPANS.
  - DECK ATTACHMENT: SUPPORTS - 5/8" PUDDLE WELDS AT 12" OC OR WELDING SHEAR STUDS THROUGH THE DECK FOR A COMPOSITE FLOOR SYSTEM.  
 SIDE LAPS - #10 TEK SCREWS @ 36" OC
- COMPOSITE BEAM LEGEND:**
- INDICATES NO. OF SHEAR STUDS (L TO R) EQUALLY SPACED BETWEEN BEAMS. ONE NUMBER INDICATES THE STUDS ARE EQUALLY SPACED ALONG ENTIRE BEAM. (SEE NOTES BELOW)
- INDUCED CAMBER AT MIDSPAN (NO INDUCED CAMBER IF BLANK)
- MAXIMUM TOTAL UNFACTORED LOAD END REACTION (10K MINIMUM)
- SHEAR CONNECTOR NOTES:**
- CONNECTORS SHALL BE 3/4" DIA. x 3 3/16" HD STUDS
  - STUDS SHALL BE LOCATED DIRECTLY OVER THE BEAM WEB IF THE BEAM FLANGE THICKNESS IS LESS THAN 0.500 INCHES

KEY PLAN



1 2ND FLOOR FRAMING PLAN - AREA A  
 S-211 1/8" = 1'-0"



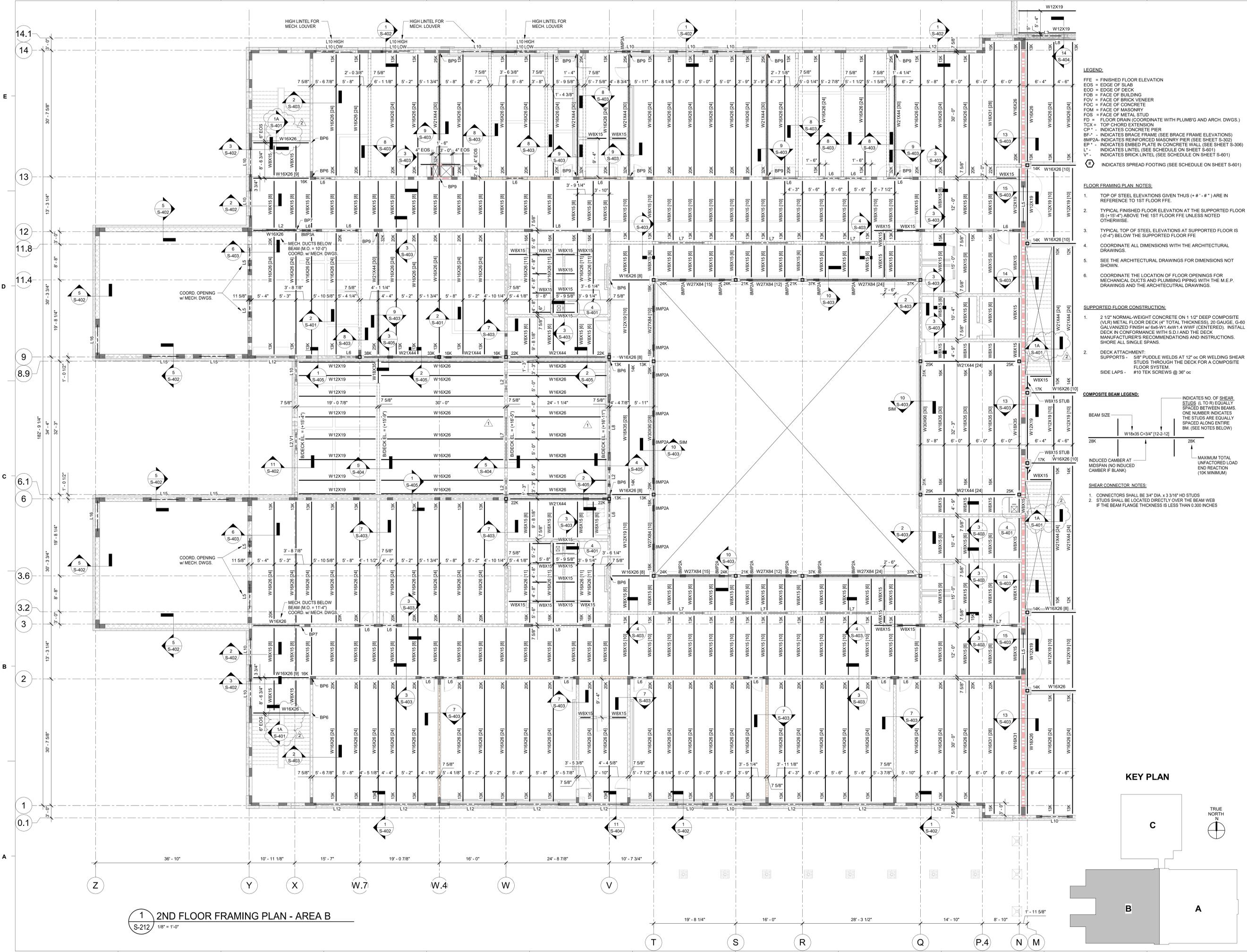
REVISIONS:

No.	Description	Date
1	ADDENDUM 2	02.07.2023
2	ADDENDUM 3	02.14.2023

PROJECT: 9201-216240  
DATE: 01-12-2023

2ND FLOOR FRAMING PLAN - AREA B

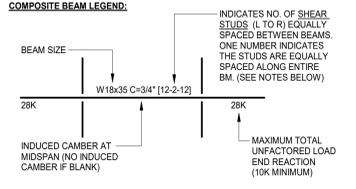
S-212



- LEGEND:**
- FFE = FINISHED FLOOR ELEVATION
  - EOS = EDGE OF SLAB
  - EOD = EDGE OF DECK
  - FOB = FACE OF BUILDING
  - FOV = FACE OF BRICK VENEER
  - FCC = FACE OF CONCRETE
  - FOM = FACE OF MASONRY
  - FOS = FACE OF METAL STUD
  - FD = FLOOR DRAIN (COORDINATE WITH PLUMB'G AND ARCH. DWGS.)
  - TCX = TOP CHORD EXTENSION
  - CS\* = INDICATES CONCRETE PIER
  - BF\* = INDICATES BRACE FRAME (SEE BRACE FRAME ELEVATIONS)
  - BMP2A = INDICATES REINFORCED MASONRY PIER (SEE SHEET S-302)
  - EP\* = INDICATES EMBED PLATE IN CONCRETE WALL (SEE SHEET S-306)
  - L\* = INDICATES LINTEL (SEE SCHEDULE ON SHEET S-601)
  - V\* = INDICATES BRICK LINTEL (SEE SCHEDULE ON SHEET S-601)
  - ⊕ = INDICATES SPREAD FOOTING (SEE SCHEDULE ON SHEET S-601)

- FLOOR FRAMING PLAN NOTES:**
- TOP OF STEEL ELEVATIONS GIVEN THUS (+ # - # ) ARE IN REFERENCE TO 1ST FLOOR FFE.
  - TYPICAL FINISHED FLOOR ELEVATION AT THE SUPPORTED FLOOR IS (+15'-4") ABOVE THE 1ST FLOOR FFE UNLESS NOTED OTHERWISE.
  - TYPICAL TOP OF STEEL ELEVATIONS AT SUPPORTED FLOOR IS (-0'-4") BELOW THE SUPPORTED FLOOR FFE.
  - COORDINATE ALL DIMENSIONS WITH THE ARCHITECTURAL DRAWINGS.
  - SEE THE ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT SHOWN.
  - COORDINATE THE LOCATION OF FLOOR OPENINGS FOR MECHANICAL DUCTS AND PLUMBING PIPING WITH THE M.E.P. DRAWINGS AND THE ARCHITECTURAL DRAWINGS.

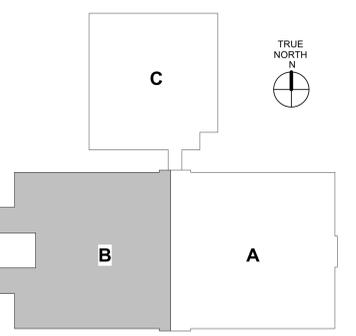
- SUPPORTED FLOOR CONSTRUCTION:**
- 2 1/2" NORMAL-WEIGHT CONCRETE ON 1 1/2" DEEP COMPOSITE (VLR) METAL FLOOR DECK (4" TOTAL THICKNESS), 20 GAUGE, G-60 GALVANIZED FINISH W/ 6x6-W-1.4xW1.4 WVF (CENTERED). INSTALL DECK IN CONFORMANCE WITH S.D.I. AND THE DECK MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS. SHORE ALL SINGLE SPANS.
  - DECK ATTACHMENT: SUPPORTS - 3/8" PUDDLE WELDS AT 12" OC OR WELDING SHEAR STUDS THROUGH THE DECK FOR A COMPOSITE FLOOR SYSTEM.  
SIDE LAPS - #10 TEK SCREWS @ 36" OC



- SHEAR CONNECTOR NOTES:**
- CONNECTORS SHALL BE 3/4" DIA. x 3 3/16" HD STUDS
  - STUDS SHALL BE LOCATED DIRECTLY OVER THE BEAM WEB IF THE BEAM FLANGE THICKNESS IS LESS THAN 6.000 INCHES

1 2ND FLOOR FRAMING PLAN - AREA B  
S-212 1/8" = 1'-0"

KEY PLAN





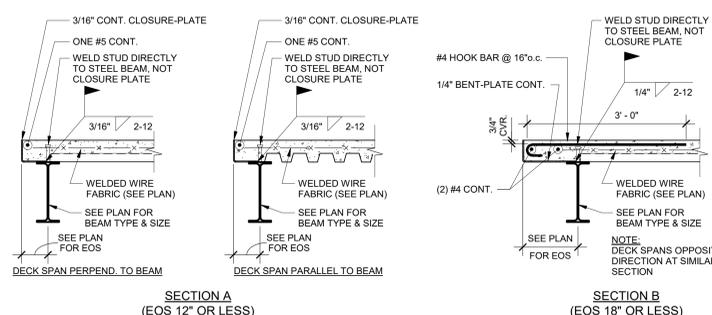
REVISIONS:

No.	Description	Date
1	ADDENDUM 3	02.14.2023

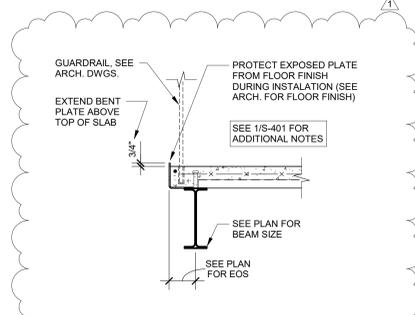
PROJECT: 9201-218240  
DATE: 01-12-2023

FRAMING SECTIONS & DETAILS

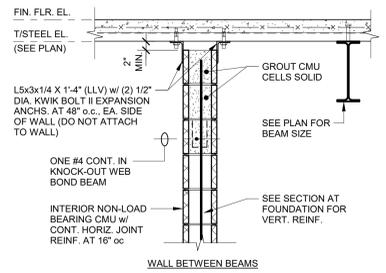
S-401



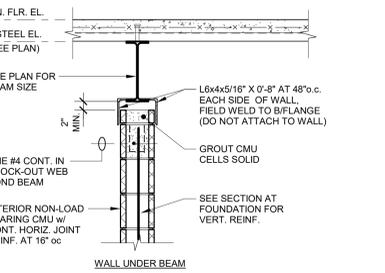
1 SECTION AT EDGE OF SLAB  
S-401 3/4" = 1'-0"



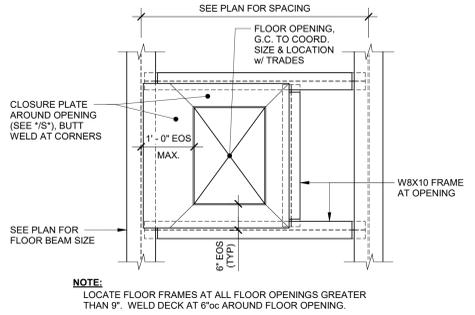
1A EDGE OF SLAB AT GUARDRAIL  
S-401 3/4" = 1'-0"



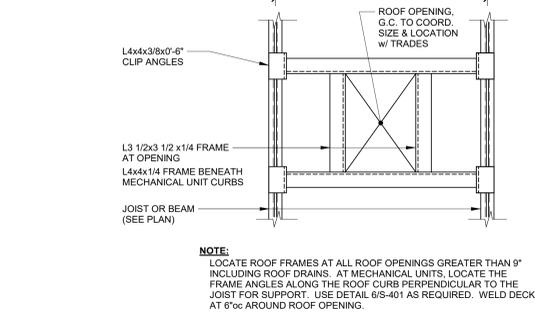
2 INT. CMU WALL BRACE (TYP. AT SUPT FLOOR)  
S-401 3/4" = 1'-0"



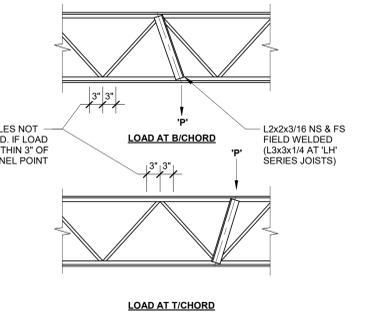
3 INT. CMU WALL BRACE (TYP. AT SUPT FLOOR)  
S-401 3/4" = 1'-0"



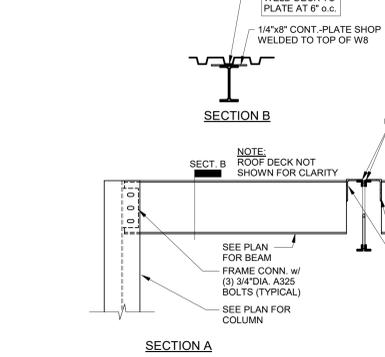
4 PLAN - TYP. FLOOR OPENING FRAME  
S-401 3/4" = 1'-0"



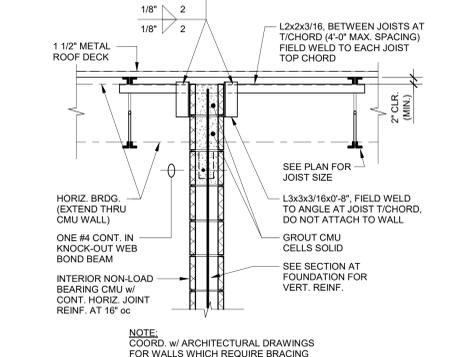
5 PLAN - TYP. ROOF OPENING FRAME  
S-401 3/4" = 1'-0"



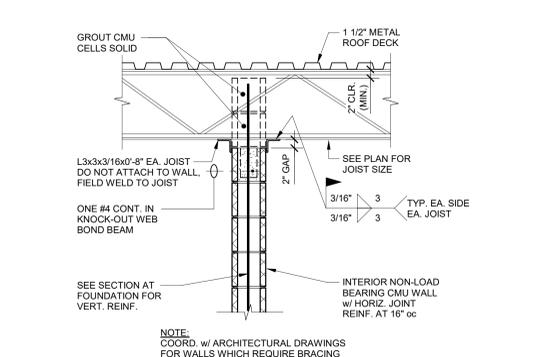
6 CONCENTRATED LOAD ON JOIST  
S-401 3/4" = 1'-0"



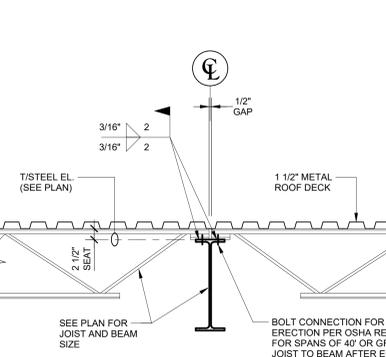
7 SECTION AT COLUMN BRACE  
S-401 3/4" = 1'-0"



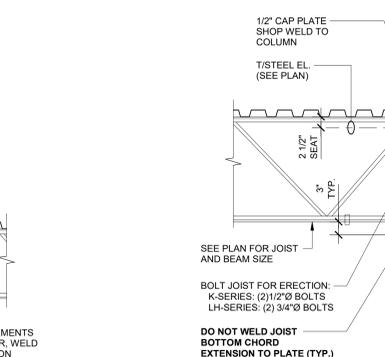
8 INT. CMU WALL BRACE (TYP. AT ROOF)  
S-401 3/4" = 1'-0"



9 INT. CMU WALL BRACE (TYP. AT ROOF)  
S-401 3/4" = 1'-0"

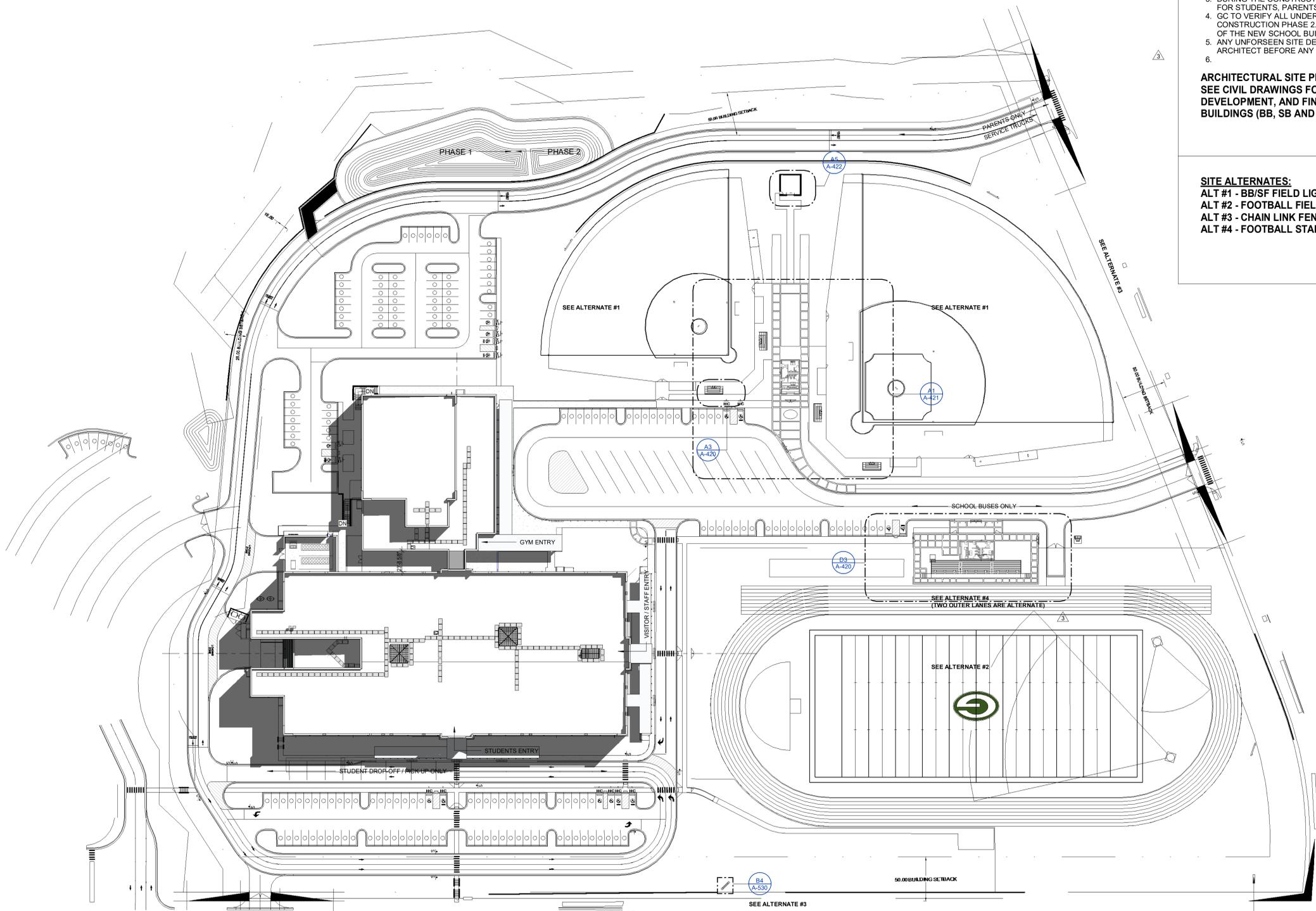


10 SECTION - 'K' SERIES JOIST BRG. ON BEAM  
S-401 3/4" = 1'-0"



11 SECTION - JOIST BEARING ON TUBE COLUMN  
S-401 3/4" = 1'-0"

E  
D  
C  
B  
A



**GENERAL NOTES - FINAL**

1. CONSTRUCTION PHASE 2 INCLUDES DEMOLITION OF THE EXISTING BUILDINGS ON CAMPUS, NEW TRAFFIC INFRASTRUCTURE (ROADS, DRIVEWAYS, PARKING AREAS, SIDEWALKS...), CONSTRUCTION OF NEW ATHLETIC FIELDS, FENCING.
2. NEWLY CONSTRUCTED TWO-STORY SCHOOL BUILDING WILL BE OPERATIONAL DURING THE CONSTRUCTION PHASE 2
3. DURING THE CONSTRUCTION PHASE 2 GC MUST PROVIDE AND MAINTAIN MAXIMUM SAFETY FOR STUDENTS, PARENTS AND STAFF.
4. GC TO VERIFY ALL UNDERGROUND UTILITY LINES THAT WILL HAVE TO BE DEMOLISHED IN CONSTRUCTION PHASE 2. ANY LINE THAT IS REQUIRED FOR NON-INTERRUPTED OPERATION OF THE NEW SCHOOL BUILDING SHALL BE RE-ROUTED AND REMAIN OPERATIONAL.
5. ANY UNFORSEEN SITE DEMOLITION CONDITION MUST BE REPORTED TO THE OWNER AND ARCHITECT BEFORE ANY ACTION IS TAKEN.
- 6.

**ARCHITECTURAL SITE PLAN IS FOR REFERENCE ONLY.  
SEE CIVIL DRAWINGS FOR FURTHER INFORMATION PERTAINING TO SITE DEVELOPMENT, AND FINAL LOCATION AND ORIENTATION OF THE FIELD BUILDINGS (BB, SB AND FB CONCESSIONS)**

**SITE ALTERNATES:**  
 ALT #1 - BB/SF FIELD LIGHTS  
 ALT #2 - FOOTBALL FIELD LIGHTS  
 ALT #3 - CHAIN LINK FENCE WITH **BLACK VINYL ALONG THE STREET PERIMETER**  
 ALT #4 - FOOTBALL STADIUM WITH 8 LANES SYNTHETIC RUNNING TRACK



**GRIER MIDDLE SCHOOL REPLACEMENT**

**LS3P**

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**REVISIONS:**

No.	Description	Date
3	ADDENDUM 1	01-31-23
5	ADDENDUM 3	02-14-23

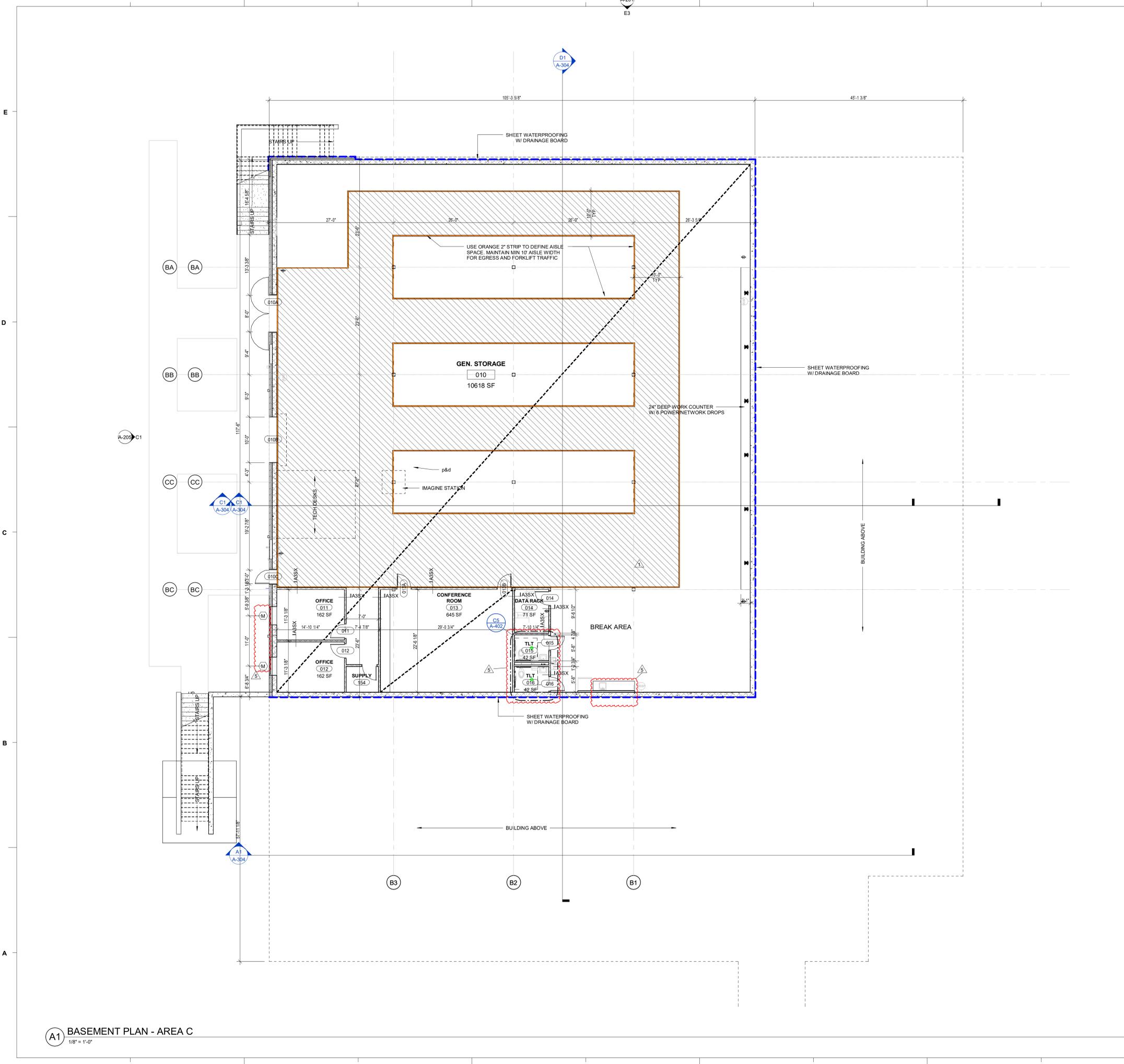
PROJECT: 9201-218240  
 DATE: 01-12-2023

**ARCHITECTURAL SITE PLAN - FINAL**

**A-001.C**



**1 ARCHITECTURAL SITE PLAN**  
 1" = 50'-0"



**(A1) BASEMENT PLAN - AREA C**  
1/8" = 1'-0"

**FLOOR PLAN SHEET NOTES**

1. EXTERIOR DIMENSIONS AT MASONRY VENEER ARE TO FACE OF MASONRY.
2. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH AND CENTERLINES OF COLUMNS, UNO.
3. LOCATE DOOR OPENINGS MIN. 4" FROM NEAREST PERPENDICULAR WALL.
4. FIRE AND SOUND RATED WALLS/PARTITIONS TO BE CONSTRUCTED TIGHT TO STRUCTURE, PIPING, DUCTWORK AND OTHER PENETRATIONS. ALL WORK IS TO BE BRACED TO STRUCTURE ABOVE.
5. WHERE PARTITIONS OF DIFFERENT FIRE RATINGS INTERSECT, THE HIGHEST RATED PARTITION SHALL CONTINUE THROUGH. MAINTAIN PARTITION FIRE RATING BEHIND RECESSED FIRE EXTINGUISHER CABINETS.
6. INSTALL BLOCKING IN PARTITIONS FOR CASEWORK, WALL MOUNTED EQUIPMENT, TRIM AND RELATED CONSTRUCTION AS INDICATED IN THE SPECIFICATIONS.
7. SEE LIFE SAFETY PLANS FOR REQUIRED FIRE SEPARATION WALLS.
8. SEE SHEET **A-602** FOR DOOR TYPES.
9. SEE SHEET **A-604** FOR LOUVER AND WINDOW GLAZING TYPES.
10. SEE SHEET **A-607** FOR CONSTRUCTION SUBSYSTEMS.
11. SEE SHEETS **A-700s & A-740s** FOR CASEWORK SCHEDULES, DESIGNATIONS & DETAILS.
12. SEE SHEETS **A-400s & A-720s** FOR INTERIOR ELEVATIONS, ACCESSORY DESCRIPTIONS & MOUNTING HEIGHTS.
13. SEE SHEETS **A-710s** FOR FINISH FLOORING, TRANSITIONS, PATTERNS AND WALL PROTECTION.
14. SEE SHEETS **A-700s** FOR FINISH LEGEND AND SCHEDULE.
15. SEE SHEETS **A-400s** FOR ENLARGED PLANS INDICATING ADDITIONAL DIMENSIONS AND PARTITION TYPES.
16. SEE SHEETS **A-700s** FOR SIGN SCHEDULE & ELEVATIONS AND DETAILS.
17. SEE STRUCTURAL DRAWINGS FOR SLAB DEPRESSIONS AND CUTOUTS.
18. SEE BUILDING ELEVATION DRAWINGS FOR LOCATION OF EXTERIOR MASONRY CONTROL JOINTS.

**PARTITION NOTES**

1. ALL NON-DESIGNATED PARTITIONS SHALL BE TYPE MBNX, U.N.O.
2. ALL PIPE AND CONDUIT PENETRATIONS THRU FIRE RATED PARTITIONS, FLOORS, ROOF, ETC. SHALL BE SEALED WITH A RESPECTIVELY RATED FIRE BARRIER PENETRATION SEALING SYSTEM BY SM OR U.L. APPROVED EQUAL.
3. TILE BACKER BOARD SHALL BE USED IN ALL LOCATIONS TO RECEIVE TILE FINISHES. REFER TO FINISH SCHEDULE AND INTERIOR ELEVATIONS FOR LOCATIONS.
4. CONTRACTOR SHALL COORDINATE WITH MECHANICAL DUCTWORK PRIOR TO FABRICATION OF PARTITION WALLS.
5. SHOULD CONDITIONS OCCUR WHERE A WALL IS UNABLE TO GO STRAIGHT UP TO STRUCTURE DUE TO PIPING, DUCTWORK, ETC., THE PARTITION (GYPSUM BOARD AND FRAMING) MAY JOG HORIZONTALLY ABOVE THE CEILING TO AVOID THE PROBLEM. FIRE AND SOUND RATED WALL INTEGRITY SHALL BE MAINTAINED.
6. WHERE STUDS EXTEND TO STRUCTURE AND GYPSUM WALLBOARD AND SOUND ATTENUATION BLANKETS EXTEND JUST ABOVE THE FINISH CEILING, CAP OFF PARTITION FINISHES WITH A RUNNER CHANNEL WHEN CEILING PLENUM IS USED AS A RETURN AIR PLENUM.
7. DIMENSIONAL CONFLICTS BETWEEN PARTITION TYPES AND THE ARCHITECTURAL FLOOR PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
8. SEE LIFE SAFETY PLANS FOR THE LOCATIONS OF SMOKE PARTITIONS AND FIRE-RATED PARTITIONS.
9. REFER TO UNDERWRITERS LABORATORIES, INC. FIRE RESISTANCE VOLUMES - CURRENT EDITION FOR SPECIFIC CONSTRUCTION REQUIREMENTS OF U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
10. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR TYPICAL U.L. LISTED PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE PROJECT-SPECIFIC U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
11. REFER TO MECHANICAL DRAWINGS FOR SMOKE OR FIRE DAMPERS IN RATED WALLS. COORDINATE EXACT FRAMING REQUIREMENTS WITH SMOKE/FIRE DAMPER MANUFACTURER. (COORDINATE ALL PARTITION CONSTRUCTION WITH MECHANICAL PRIME CONTRACTOR PRIOR TO COMMENCING PARTITION CONSTRUCTION).
12. AT ALL CONSTRUCTED PARTITIONS THE CONTRACTOR IS TO MAINTAIN THE SOUND AND FIRE-RESISTIVE INTEGRITY.

**INTERIOR NOTES**

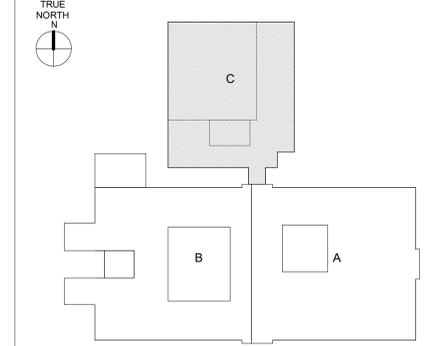
1. CORK STRIPS TO BE MOUNTED AT 58" AFF ALONG ALL GRADE CORRIDOR WALLS FROM END TO END ON BOTH SIDES.

**REVISION NOTE:**  
WALL TAGS ADDED IN OFFICE AREA

**PARTITION LEGEND**

1. ALL EXTERIOR WALLS TO BE **W1** U.N.O.
  2. ALL INTERIOR MASONRY PARTITIONS TO BE **MBNX** U.N.O.
  3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE **A3SX** U.N.O.
- NON-RATED PARTITION TO 4" ABOVE CEILING
  - NON-RATED METAL STUD PARTITION TO DECK
  - NON-RATED CMU PARTITION
  - SMOKE PARTITION TO DECK
  - 1 HR. RATED PARTITION TO DECK
  - 2 HR. RATED PARTITION TO DECK
- NOTE: SEE SHEET **A-603** FOR CONSTRUCTION OF PARTITION TYPES

**KEY PLAN**



**GRIER MIDDLE SCHOOL REPLACEMENT**



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**REVISIONS:**

No.	Description	Date
1	AGENCY REVIEW	11-11-22
5	ADDENDUM 3	02-14-23

PROJECT: 9201-216240  
DATE: 01-12-2023

**BASEMENT FLOOR PLAN AREA C**

**A-100C**



**FIRST FLOOR PLAN - AREA A**  
1/8" = 1'-0"

**FLOOR PLAN SHEET NOTES**

1. EXTERIOR DIMENSIONS AT MASONRY VENEER ARE TO FACE OF MASONRY.
2. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH AND CENTERLINES OF COLUMNS, UNO.
3. LOCATE DOOR OPENINGS MIN. 4" FROM NEAREST PERPENDICULAR WALL.
4. FIRE AND SOUND RATED WALLS/PARTITIONS TO BE CONSTRUCTED TIGHT TO STRUCTURE, PIPING, DUCTWORK AND OTHER PENETRATIONS. ALL WORK IS TO BE BRACED TO STRUCTURE ABOVE.
5. WHERE PARTITIONS OF DIFFERENT FIRE RATINGS INTERSECT, THE HIGHEST RATED PARTITION SHALL CONTINUE THROUGH. MAINTAIN PARTITION FIRE RATING BEHIND RECESSED FIRE EXTINGUISHER CABINETS.
6. INSTALL BLOCKING IN PARTITIONS FOR CASEWORK, WALL MOUNTED EQUIPMENT, TRIM AND RELATED CONSTRUCTION AS INDICATED IN THE SPECIFICATIONS.
7. SEE LIFE SAFETY PLANS FOR REQUIRED FIRE SEPARATION WALLS.
8. SEE SHEET A-502 FOR DAMP TYPES, FOR LOUVER AND WINDOW GLAZING TYPES.
9. SEE SHEET A-604 FOR LOUVER AND WINDOW GLAZING TYPES.
10. SEE SHEET A-602 FOR CONSTRUCTION SUBSYSTEMS.
11. SEE SHEETS A-700 & A-701 FOR CASEWORK SCHEDULES, DESIGNATIONS & DETAILS.
12. SEE SHEETS A-400 & A-700 FOR INTERIOR ELEVATIONS, ACCESSORY DESCRIPTIONS & MOUNTING HEIGHTS.
13. SEE SHEETS A-700 FOR FINISH FLOORING, TRANSITIONS, PATTERNS AND WALL PROTECTION.
14. SEE SHEETS A-700 FOR FINISH LEGEND AND SCHEDULE.
15. SEE SHEETS A-400 FOR ENLARGED PLANS INDICATING ADDITIONAL DIMENSIONS AND PARTITION TYPES.
16. SEE SHEETS A-700 FOR SIGN SCHEDULE & ELEVATIONS AND DETAILS.
17. SEE STRUCTURAL DRAWINGS FOR SLAB DEPRESSIONS AND CUTOUTS.
18. SEE BUILDING ELEVATION DRAWINGS FOR LOCATION OF EXTERIOR MASONRY CONTROL JOINTS.

**PARTITION NOTES**

1. ALL NON-DESIGNATED PARTITIONS SHALL BE TYPE MBNX, U.N.O.
2. ALL PIPE AND CONDUIT PENETRATIONS THRU FIRE RATED PARTITIONS, FLOORS, ROOF, ETC. SHALL BE SEALED WITH A RESPECTIVELY RATED FIRE BARRIER PENETRATION SEALING SYSTEM BY SM OR U.L. APPROVED EQUAL.
3. TILE BACKER BOARD SHALL BE USED IN ALL LOCATIONS TO RECEIVE TILE FINISHES. REFER TO FINISH SCHEDULE AND INTERIOR ELEVATIONS FOR LOCATIONS.
4. CONTRACTOR SHALL COORDINATE WITH MECHANICAL DUCTWORK PRIOR TO FABRICATION OF PARTITION WALLS.
5. SHOULD CONDITIONS OCCUR WHERE A WALL IS UNABLE TO GO STRAIGHT UP TO STRUCTURE DUE TO PIPING, DUCTWORK, ETC., THE PARTITION (GYPSUM BOARD AND FRAMING) MAY JOG HORIZONTALLY ABOVE THE CEILING TO AVOID THE PROBLEM. FIRE AND SOUND RATED WALL INTEGRITY SHALL BE MAINTAINED.
6. WHERE STUDS EXTEND TO STRUCTURE AND GYPSUM WALLBOARD AND SOUND ATTENUATION BLANKETS EXTEND JUST ABOVE THE FINISH CEILING, CAP OFF PARTITION FINISHES WITH A RUNNER CHANNEL WHEN CEILING PLENUM IS USED AS A RETURN AIR PLENUM.
7. DIMENSIONAL CONFLICTS BETWEEN PARTITION TYPES AND THE ARCHITECTURAL FLOOR PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
8. SEE LIFE SAFETY PLANS FOR THE LOCATIONS OF SMOKE PARTITIONS AND FIRE-RATED PARTITIONS.
9. REFER TO UNDERWRITERS LABORATORIES, INC. FIRE RESISTANCE VOLUMES - CURRENT EDITION FOR SPECIFIC CONSTRUCTION REQUIREMENTS OF U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
10. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR TYPICAL U.L. LISTED PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE PROJECT-SPECIFIC U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
11. REFER TO MECHANICAL DRAWINGS FOR SMOKE OR FIRE DAMPERS IN RATED WALLS. COORDINATE EXACT FRAMING REQUIREMENTS WITH SMOKE/FIRE DAMPER MANUFACTURER. (COORDINATE ALL PARTITION CONSTRUCTION WITH MECHANICAL PRIME CONTRACTOR PRIOR TO COMMENCING PARTITION CONSTRUCTION).
12. AT ALL CONSTRUCTED PARTITIONS THE CONTRACTOR IS TO MAINTAIN THE SOUND AND FIRE-RESISTIVE INTEGRITY.

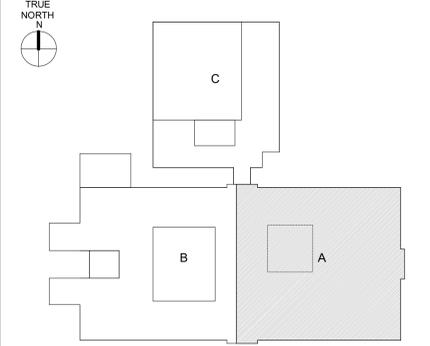
**INTERIOR NOTES**

1. CORK STRIPS TO BE MOUNTED AT 58" AFF ALONG ALL GRADE CORRIDOR WALLS FROM END TO END ON BOTH SIDES.

**PARTITION LEGEND**

1. ALL EXTERIOR WALLS TO BE W1, U.N.O.
  2. ALL INTERIOR MASONRY PARTITIONS TO BE MBNX, U.N.O.
  3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE AS3X, U.N.O.
- NON-RATED PARTITION TO 4" ABOVE CEILING
  - NON-RATED METAL STUD PARTITION TO DECK
  - NON-RATED CMU PARTITION
  - SMOKE PARTITION TO DECK
  - 1 HR. RATED PARTITION TO DECK
  - 2 HR. RATED PARTITION TO DECK
- NOTE: SEE SHEET A-603 FOR CONSTRUCTION OF PARTITION TYPES

**KEY PLAN**



**GRIER MIDDLE SCHOOL REPLACEMENT**



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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-22
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
DATE: 01-12-2023

**FIRST FLOOR PLAN AREA A**

**A-101A**



REFLECTED CEILING PLAN SHEET NOTES

- SEE SHEET A-003 FOR WALL TYPES AND HEIGHT OF WALLS ABOVE CEILING.
- SEE FINISH SCHEDULE FOR CEILING TYPES & MATERIALS IN EACH ROOM / AREA.
- SEE SHEET A-505 FOR SEISMIC CEILING CONSTRUCTION DETAILS.
- PERIMETER TRACK FOR ALL ACOUSTICAL CEILING GRIDS TO BE 2" WIDE INSTALLED IN ACCORDANCE WITH IBC AND DISCA GUIDELINES.
- DIMENSIONS ARE TO FACE OF WALL OR MASONRY.
- CEILING GRID/TILES TO BE CENTERED IN ALL ROOMS UNLESS NOTED OTHERWISE. PARTIAL TILES AT ROOM PERIMETERS SHALL NOT BE LESS THAN 6" IN EITHER DIMENSION.
- ALL CEILING TO BE 10'-0" AFF. UNO. CEILING HEIGHTS SHOWN ON THE REFLECTED CEILING PLANS ARE NON-TYPICAL AND SPECIFIC TO THE AREA INDICATED. REFER TO INTERIOR ELEVATIONS FOR THE HEIGHTS OF SOFFITS ABOVE CASEWORK.
- SEE ELECTRICAL, FIRE ALARM AND FIRE PROTECTION DRAWINGS FOR SPECIAL SYSTEMS, SMOKE DETECTORS, LIGHTING AND WALL MOUNTED FIXTURES NOT SHOWN ON THIS SHEET. COORDINATE LOCATIONS OF ALL FIXTURES NOT INDICATED WITH LAYOUT INDICATED ON THIS SHEET.
- LIGHT FIXTURES AND MECHANICAL DIFFUSERS ARE SHOWN FOR POSITIONING IN FINISH CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE TYPES, MECHANICAL DIFFUSERS, WALL MOUNTED FIXTURES AND INSTALLATION OF FIXTURES IN SPACES WITHOUT CEILING. (LIGHTING AND HVAC DIFFUSERS ARE SHOWN FOR COORDINATION ONLY - SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR SPECIFIC INFORMATION).
- SEE MECHANICAL FLOOR PLANS FOR EXTENT OF EXPOSED DUCTWORK IN EXPOSED STRUCTURE AREAS WITHOUT CEILING.
- EXTEND PERIMETER WALLS AND FINISH TO STRUCTURE ABOVE AT EXPOSED STRUCTURE AREAS. PAINT ALL EXPOSED DUCTWORK, PIPING, HANGERS, ETC...
- SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MOUNTING LOCATIONS OF ITEMS WHERE NO CEILING IS INDICATED.
- CENTER LIGHTS, DIFFUSERS, EXIT SIGNS SMOKE DETECTORS, SPEAKERS, GENERAL ALARM SPEAKERS/STROBES & MISC DEVICES IN CEILING TILES WHERE THEY ARE LOCATED. ALIGN MULTIPLE ITEM CENTER OR EDGES.
- LOCATE MECHANICAL GRILLES AND DIFFUSERS SHOWN IN CORNERS OR NEAR WALL TO 12" OFF WALLS, UNO.
- INSTALL ACCESS PANELS IN GYPSUM BOARD CEILING AT DUCT DAMPER CONTROLS, DUCT MOUNTED SMOKE DETECTORS, MANUAL DUCT CONTROLS, ETC.
- ALL SINGLE LIGHT FIXTURES SHALL BE CENTERED IN THE CEILING WITHIN THEY OCCUR.
- LIGHTS LOCATED IN STAIRS SHALL OCCUR AT EACH FLOOR AND INTERMEDIATE LANDINGS.
- LOCATE SPRINKLER HEADS IN THE CENTER ZONE OF THE CEILING TILE. ALIGN CORRIDOR SPRINKLER HEADS IN THE SAME LINE PARALLEL TO THE WALL WITHIN EACH SPECIFIC CEILING CONSTRUCTION.
- SPRINKLER HEADS, OTHER THAN CONCEALED, SHALL BE FULLY RECESSED (CENTER IN CEILING TILE).
- EXTEND ACT-4 WALL TO WALL INCLUDING AREAS ABOVE ACT-1 FLOATING CEILING CLOUDS.

RCP LEGEND

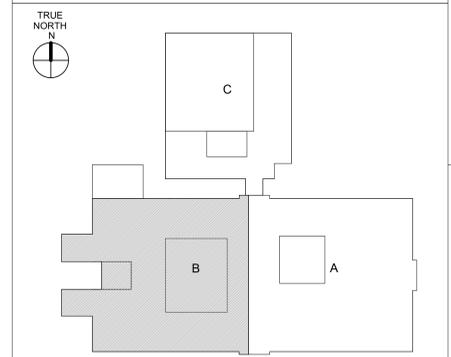
	ACT-1 1'-0" AFF.	HEIGHT (FEET, INCHES) ABOVE FINISHED FLOOR, 10'-0" U.N.O.
		1 X 4 LIGHT FIXTURE
		2 X 4 LIGHT FIXTURE
		2 X 2 LIGHT FIXTURE
		LINEAR PENDANT LIGHT FIXTURE
		CAN LIGHT FIXTURE
		SUPPLY AIR DIFFUSER
		RETURN AIR DIFFUSER
		EXHAUST FAN
		CEILING ACCESS PANEL

NOTE: EXIT SIGNS AND EMERGENCY LIGHTS ADDED TO RCPs

PARTITION LEGEND

- ALL EXTERIOR WALLS TO BE W1 U.N.O.
  - ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
  - ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A3SX U.N.O.
- NON-RATED PARTITION TO 4" ABOVE CEILING
  - NON-RATED METAL STUD PARTITION TO DECK
  - NON-RATED CMU PARTITION
  - SMOKE PARTITION TO DECK
  - 1 HR. RATED PARTITION TO DECK
  - 2 HR. RATED PARTITION TO DECK
- NOTE: SEE SHEET A-003 FOR CONSTRUCTION OF PARTITION TYPES

KEY PLAN



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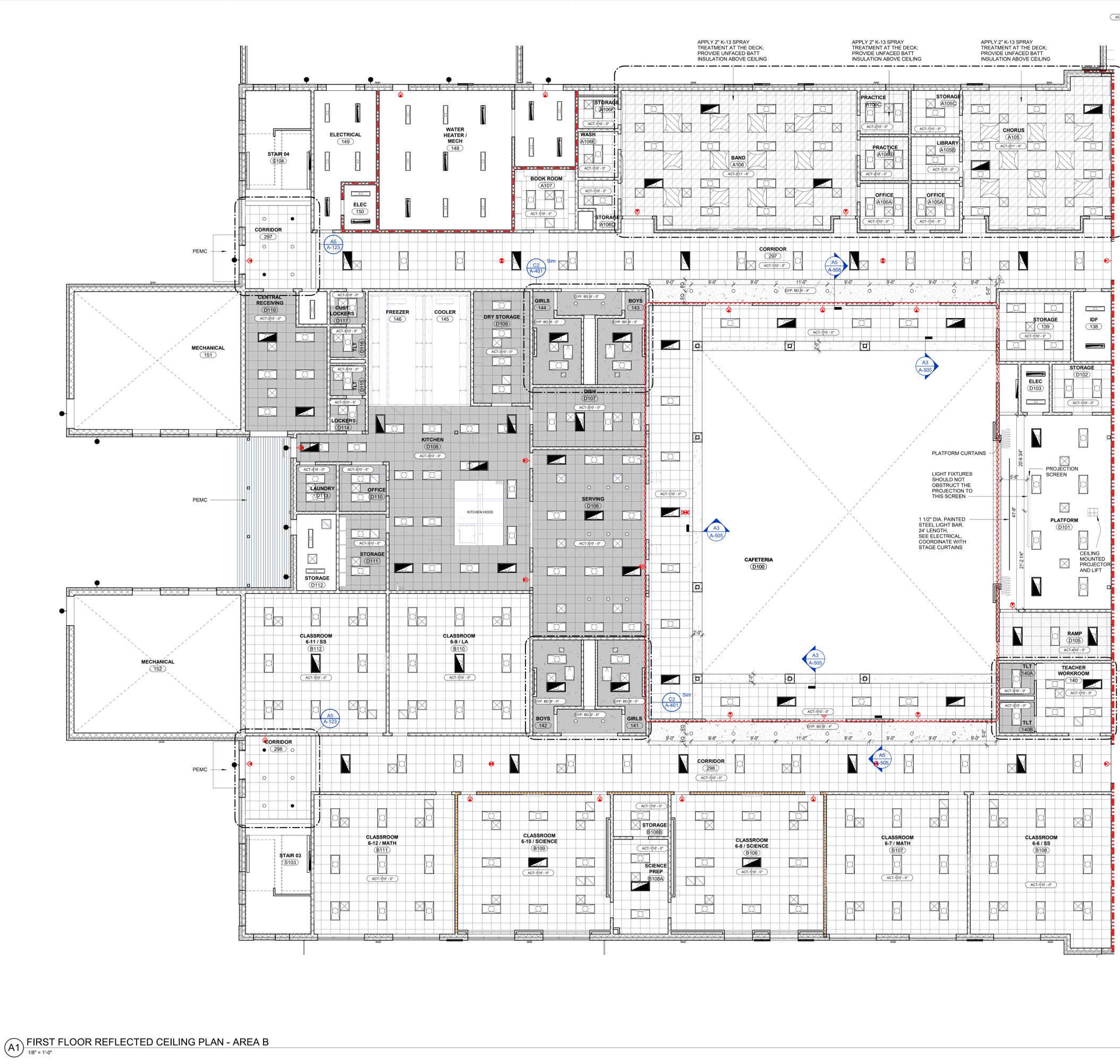
REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-22
5	ADDENDUM 3	02-14-23

PROJECT: 9201-216240  
DATE: 01-12-2023

FIRST FLOOR REFLECTED CEILING PLAN - AREA B

A-121B



(A1) FIRST FLOOR REFLECTED CEILING PLAN - AREA B  
1/8" = 1'-0"



REFLECTED CEILING PLAN SHEET NOTES

- SEE SHEET A-003 FOR WALL TYPES AND HEIGHT OF WALLS ABOVE CEILING.
- SEE FINISH SCHEDULE FOR CEILING TYPES & MATERIALS IN EACH ROOM / AREA.
- SEE SHEET A-003 FOR SEISMIC CEILING CONSTRUCTION DETAILS.
- PERIMETER TRACK FOR ALL ACOUSTICAL CEILING GRIDS TO BE 2" WIDE INSTALLED IN ACCORDANCE WITH IBC AND CISCA GUIDELINES.
- DIMENSIONS ARE TO FACE OF WALL OR MASONRY.
- CEILING GRIDS/TILES TO BE CENTERED IN ALL ROOMS UNLESS NOTED OTHERWISE. PARTIAL TILES AT ROOM PERIMETERS SHALL NOT BE LESS THAN 6" IN EITHER DIMENSION.
- ALL CEILING TO BE 10'-0" AFF. UNO. CEILING HEIGHTS SHOWN ON THE REFLECTED CEILING PLANS ARE NON-TYPICAL AND SPECIFIC TO THE AREA INDICATED. REFER TO INTERIOR ELEVATIONS FOR THE HEIGHTS OF SOFFITS ABOVE CASEWORK.
- SEE ELECTRICAL, FIRE ALARM AND FIRE PROTECTION DRAWINGS FOR SPECIAL SYSTEMS. SMOKE DETECTORS, LIGHTING AND WALL MOUNTED FIXTURES NOT SHOWN ON THIS SHEET. COORDINATE LOCATIONS OF ALL FIXTURES NOT INDICATED WITH LAYOUT INDICATED ON THIS SHEET.
- LIGHT FIXTURES AND MECHANICAL DIFFUSERS ARE SHOWN FOR POSITIONING IN FINISH CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE TYPES, MECHANICAL DIFFUSERS, WALL MOUNTED FIXTURES AND INSTALLATION OF FIXTURES IN SPACES WITHOUT CEILINGS. (LIGHTING AND HVAC DIFFUSERS ARE SHOWN FOR COORDINATION ONLY - SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR SPECIFIC INFORMATION).
- SEE MECHANICAL FLOOR PLANS FOR EXTENT OF EXPOSED DUCTWORK IN EXPOSED STRUCTURE AREAS WITHOUT CEILINGS.
- EXTEND PERIMETER WALLS AND FINISH TO STRUCTURE ABOVE AT EXPOSED STRUCTURE AREAS. PAINT ALL EXPOSED DUCTWORK, PIPING, HANGERS, ETC....
- SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MOUNTING LOCATIONS OF ITEMS WHERE NO CEILING IS INDICATED.
- CENTER LIGHTS, DIFFUSERS, EXIT SIGNS, SMOKE DETECTORS, SPEAKERS, GENERAL ALARM SPEAKERS/STROBES & MISC DEVICES IN CEILING TILES WHERE THEY ARE LOCATED. ALIGN MULTIPLE ITEM CENTER OR EDGES.
- LOCATE MECHANICAL GRILLES AND DIFFUSERS SHOWN IN CORNERS OR NEAR WALL TO 12" OFF WALLS, UNO.
- INSTALL ACCESS PANELS IN GYPSUM BOARD CEILINGS AT DUCT DAMPER CONTROLS, DUCT MOUNTED SMOKE DETECTORS, MANUAL DUCT CONTROLS, ETC.
- ALL SINGLE LIGHT FIXTURES SHALL BE CENTERED IN THE CEILING WITHIN THEIR OCCUR.
- LIGHTS LOCATED IN STAIRS SHALL OCCUR AT EACH FLOOR AND INTERMEDIATE LANDINGS.
- LOCATE SPRINKLER HEADS IN THE CENTER ZONE OF THE CEILING TILE. ALIGN CORRIDOR SPRINKLER HEADS IN THE SAME LINE PARALLEL TO THE WALL WITHIN EACH SPECIFIC CEILING CONSTRUCTION.
- SPRINKLER HEADS, OTHER THAN CONCEALED, SHALL BE FULLY RECESSED IN CEILING TILE.
- ALL GWB CEILINGS TO RECEIVE CONCEALED SPRINKLER HEADS.
- EXTEND ACT-4 WALL TO WALL INCLUDING AREAS ABOVE ACT-1 FLOATING CEILING CLOUDS.

RCP LEGEND

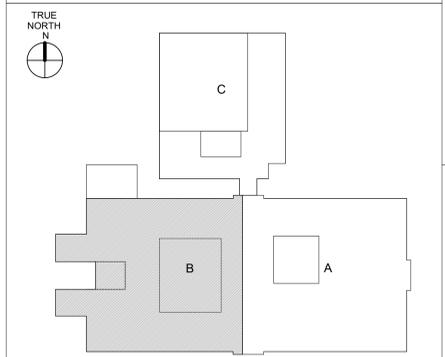
	ACT-1 1-0' AFF.	HEIGHT (FEET, INCHES) ABOVE FINISHED FLOOR, 10'-0" U.N.O.
		1 X 4 LIGHT FIXTURE
		2 X 4 LIGHT FIXTURE
		2 X 2 LIGHT FIXTURE
		LINEAR PENDANT LIGHT FIXTURE
		CAN LIGHT FIXTURE
		SUPPLY AIR DIFFUSER
		RETURN AIR DIFFUSER
		EXHAUST FAN
		CEILING ACCESS PANEL

NOTE: EXIT SIGNS AND EMERGENCY LIGHTS ADDED TO RCPs

PARTITION LEGEND

- ALL EXTERIOR WALLS TO BE W1 U.N.O.
  - ALL INTERIOR MASONRY PARTITIONS TO BE M8NX U.N.O.
  - ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE A35X U.N.O.
- NON-RATED PARTITION TO 4" ABOVE CEILING
  - NON-RATED METAL STUD PARTITION TO DECK
  - NON-RATED CMU PARTITION
  - SMOKE PARTITION TO DECK
  - 1 HR. RATED PARTITION TO DECK
  - 2 HR. RATED PARTITION TO DECK
- NOTE: SEE SHEET A-003 FOR CONSTRUCTION OF PARTITION TYPES

KEY PLAN



PROJECT: 9201-216240  
DATE: 01-12-2023

SECOND FLOOR REFLECTED CEILING PLAN - AREA B

A-122B



A1 SECOND FLOOR REFLECTED CEILING PLAN - AREA B  
1/8" = 1'-0"

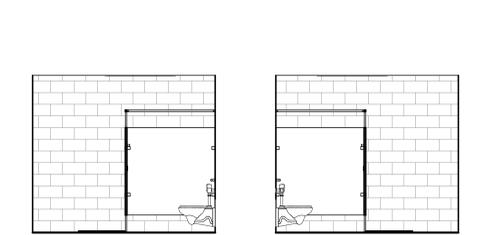
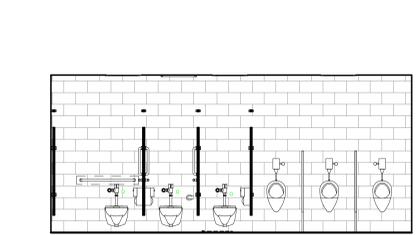
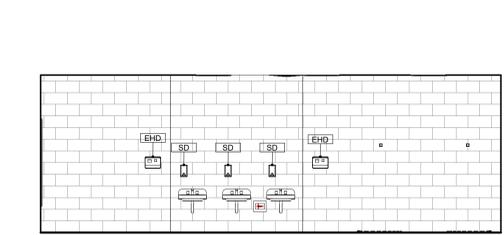
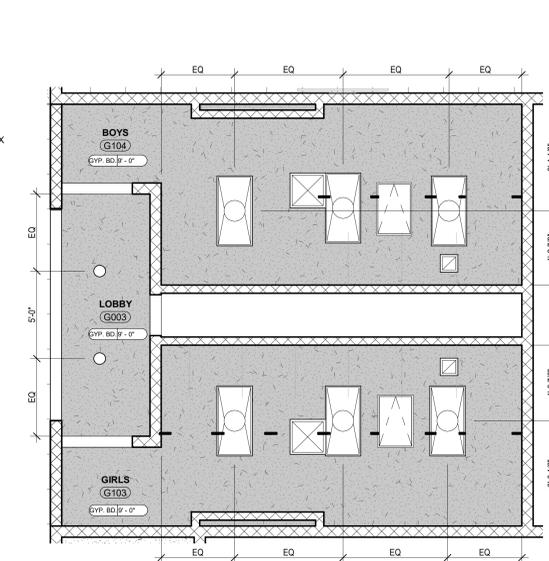
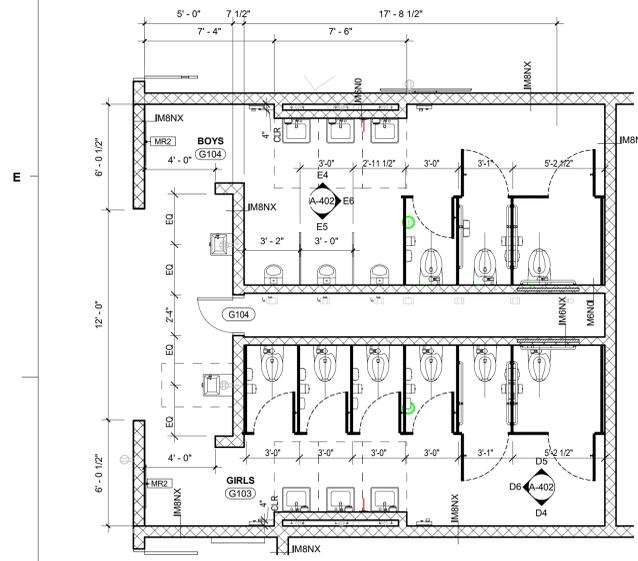
REVISIONS:

No.	Description	Date
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
 DATE: 01-12-2023

ENLARGED PLAN - RESTROOMS

A-402



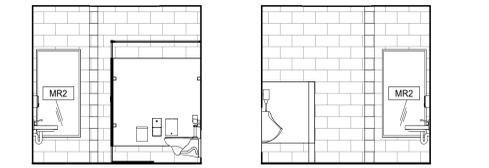
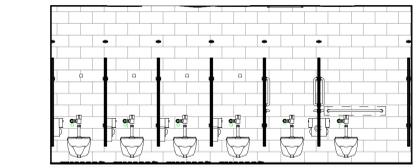
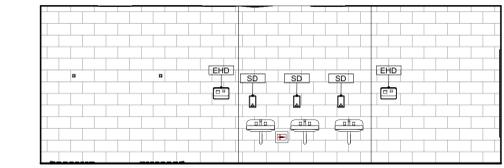
D1 ENLARGED RR PLAN - G104, G103 BOYS & GIRLS RR  
 1/4" = 1'-0"

D2 RCP - BOYS & GIRLS RR G103, G104  
 1/4" = 1'-0"

E4 INT. RR ELEV. @ BOYS RR G104 - N  
 1/4" = 1'-0"

E5 INT. RR ELEV. @ BOYS RR G104 - S  
 1/4" = 1'-0"

E6 INT. RR ELEV. @ BOYS & GIRLS RR G103, G104 - E  
 1/4" = 1'-0"



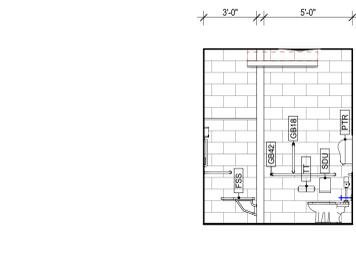
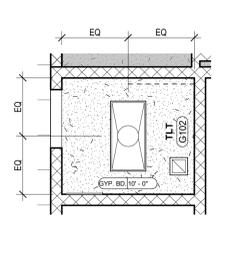
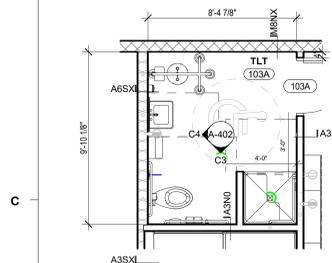
D3 ENLARGED RR PLAN - TLT 103A HEALTH RR  
 1/4" = 1'-0"

D4 RCP - TLT G103 HEALTH RR  
 1/4" = 1'-0"

D4 INT. RR ELEV. @ GIRLS RR G103 - S  
 1/4" = 1'-0"

D5 INT. RR ELEV. @ GIRLS G103 - N  
 1/4" = 1'-0"

D6 INT. RR ELEV. @ BOYS & GIRLS RR G103, G104 - W  
 1/4" = 1'-0"

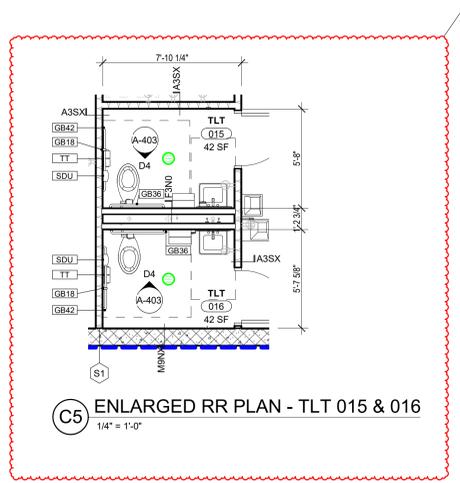


C1 ENLARGED RR PLAN - TLT 103A HEALTH RR  
 1/4" = 1'-0"

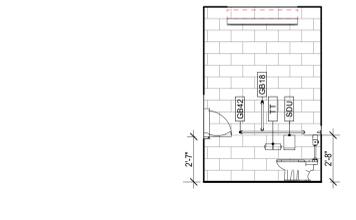
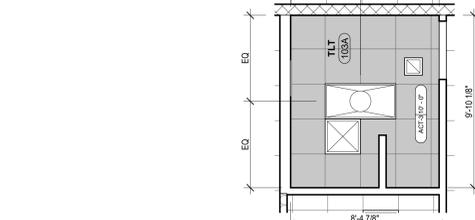
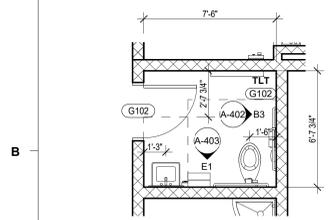
C2 RCP - TLT G103 HEALTH RR  
 1/4" = 1'-0"

C3 INT. RR ELEV. @ HEALTH RR G103 - S  
 1/4" = 1'-0"

C4 INT. RR ELEV. @ HEALTH RR G103 - W  
 1/4" = 1'-0"



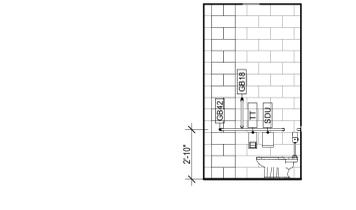
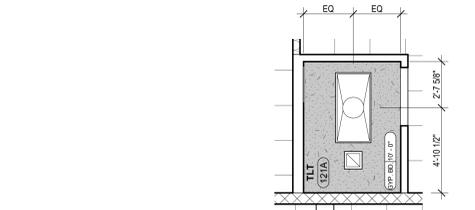
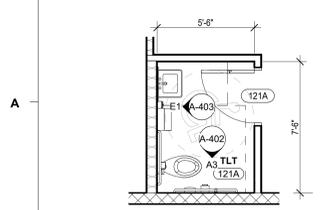
C5 ENLARGED RR PLAN - TLT 015 & 016  
 1/4" = 1'-0"



B1 TYP. ENLARGED RR PLAN - G102 TLT  
 1/4" = 1'-0"

B2 RCP - TLT G102  
 1/4" = 1'-0"

B3 INT ELEV. @ TLT G102 - E  
 1/4" = 1'-0"



A1 ENLARGED RR PLAN - TLT 121A PRINCIPAL RR  
 1/4" = 1'-0"

A2 RCP - TLT 121A PRINCIPAL RR  
 1/4" = 1'-0"

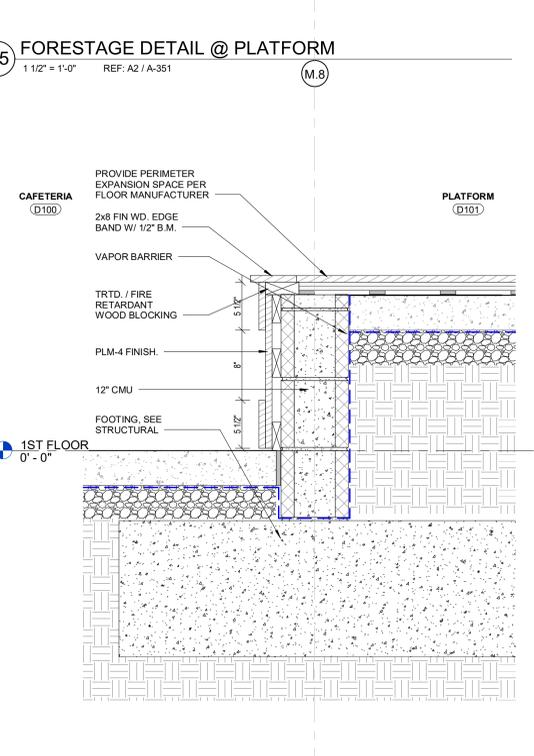
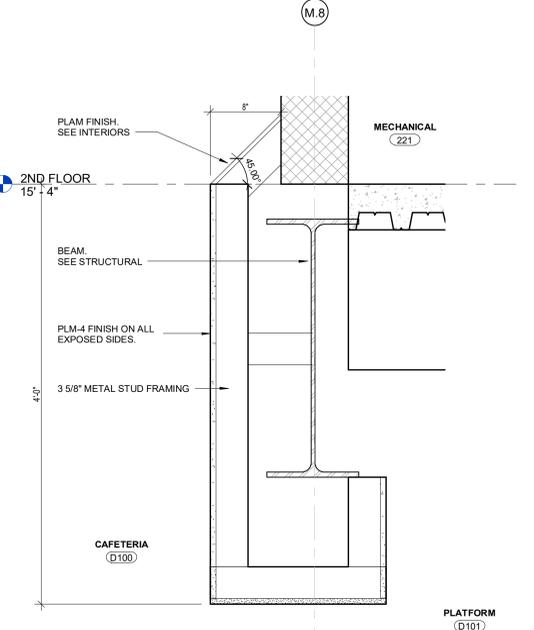
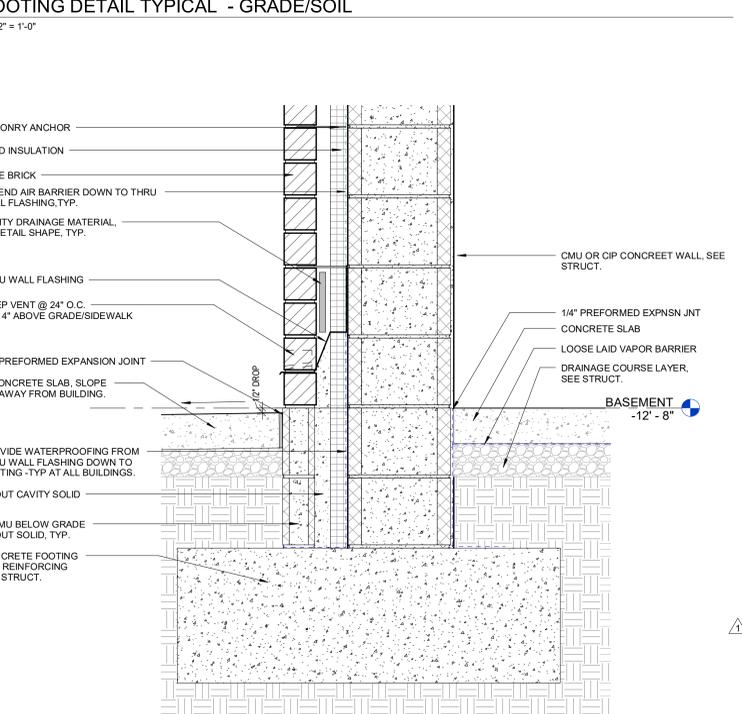
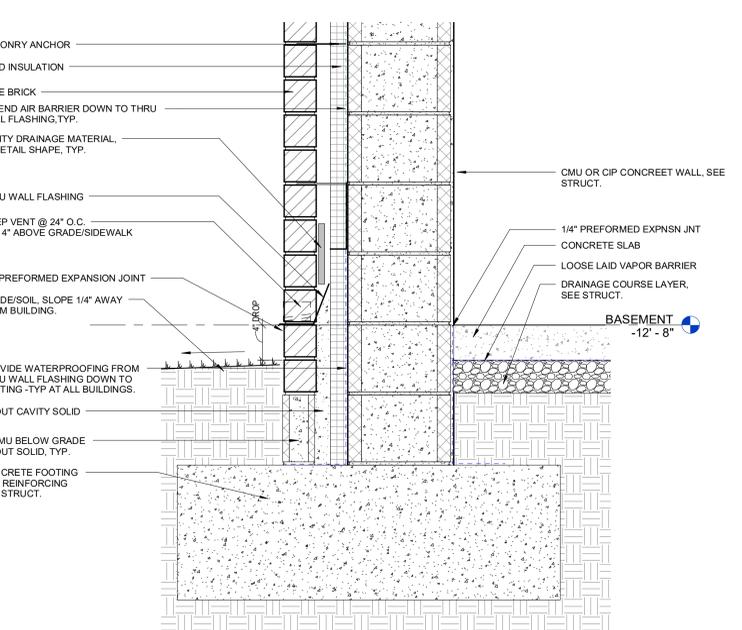
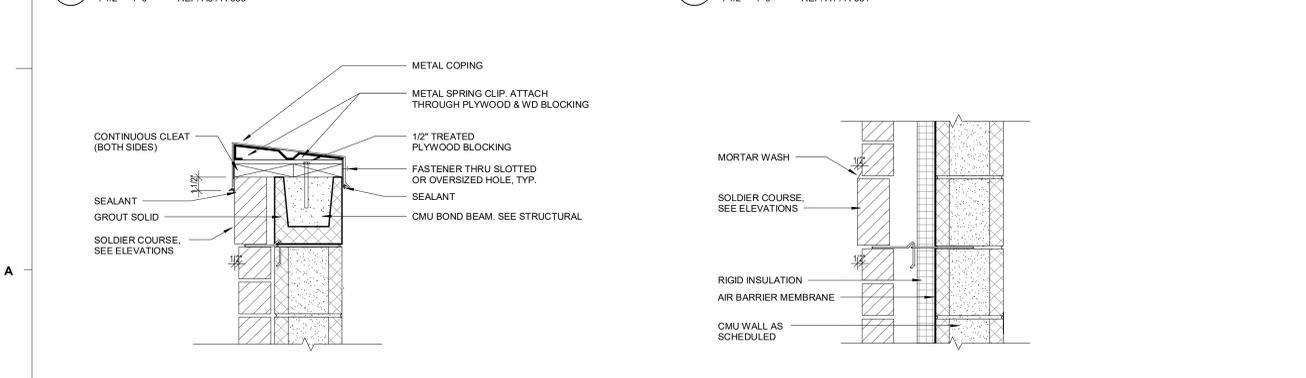
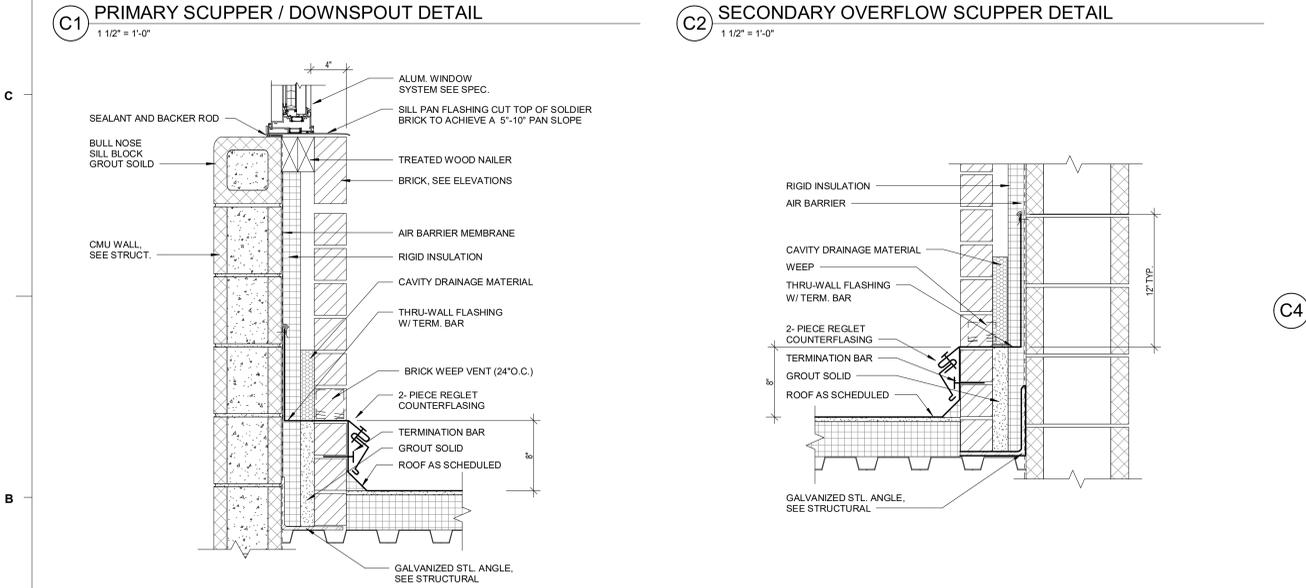
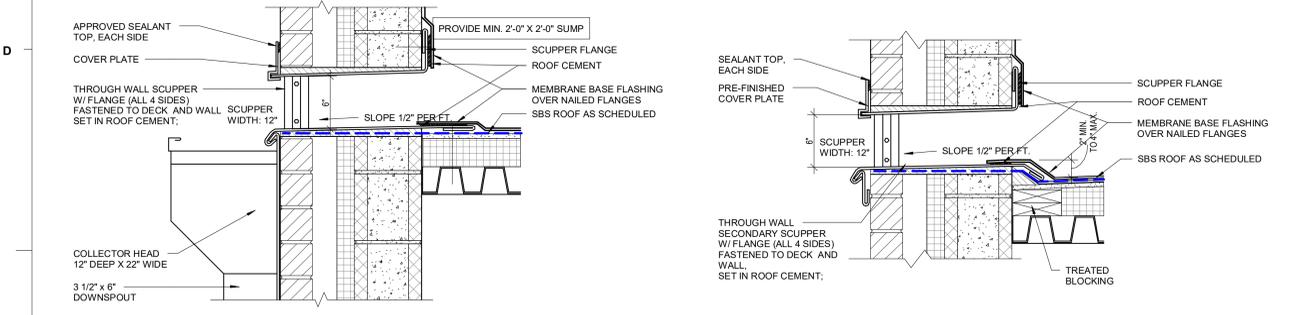
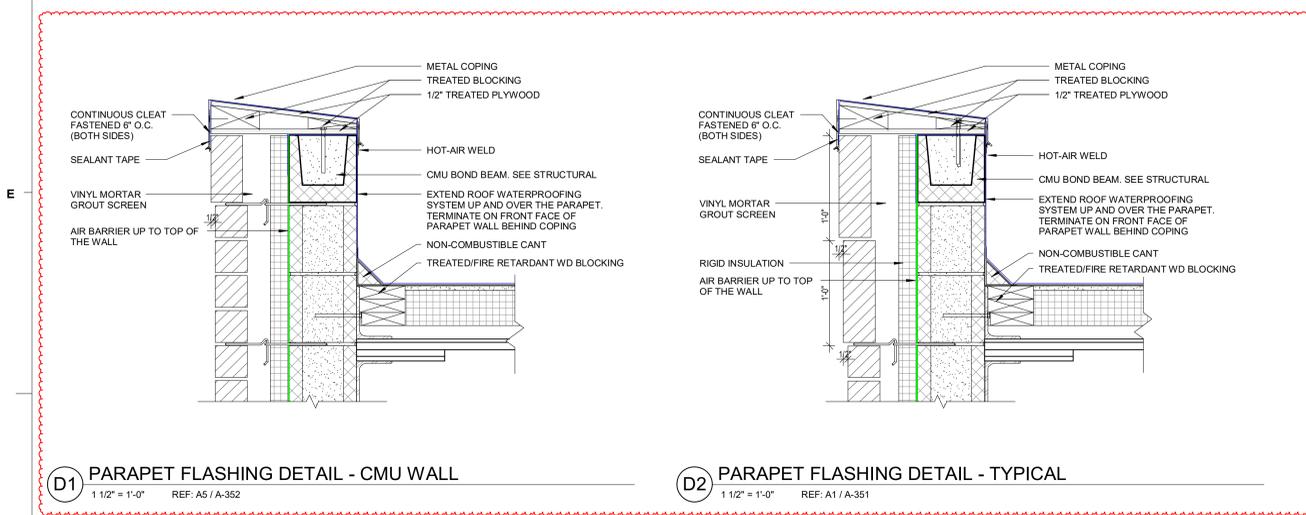
A3 INT. RR ELEV. @ 121A PRINCIPAL RR - S  
 1/4" = 1'-0"



REVISIONS:

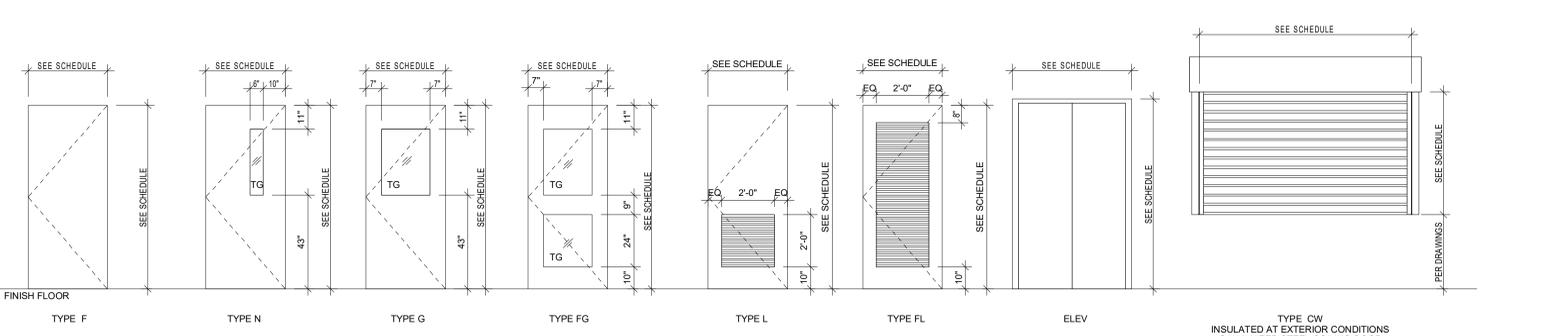
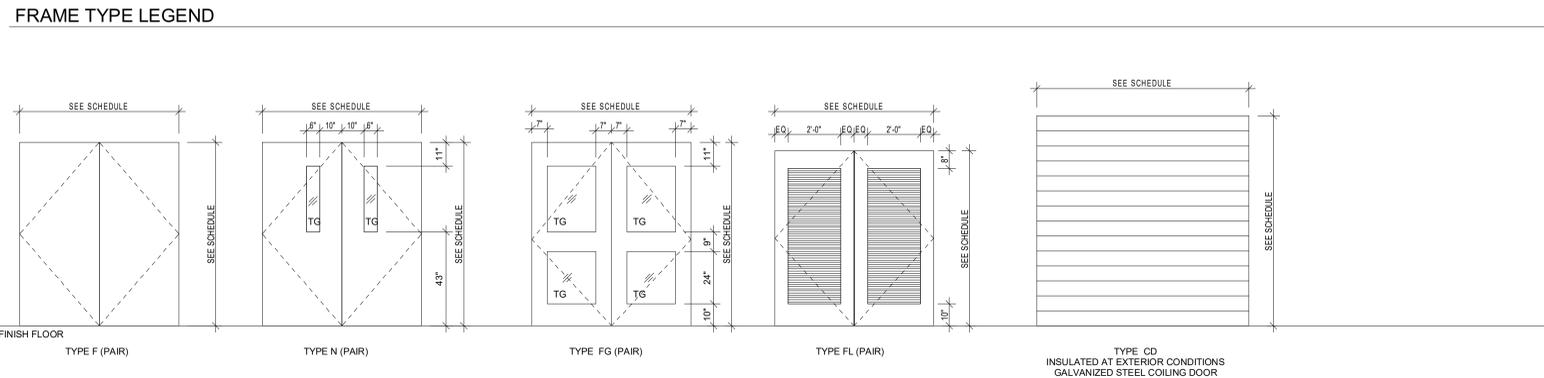
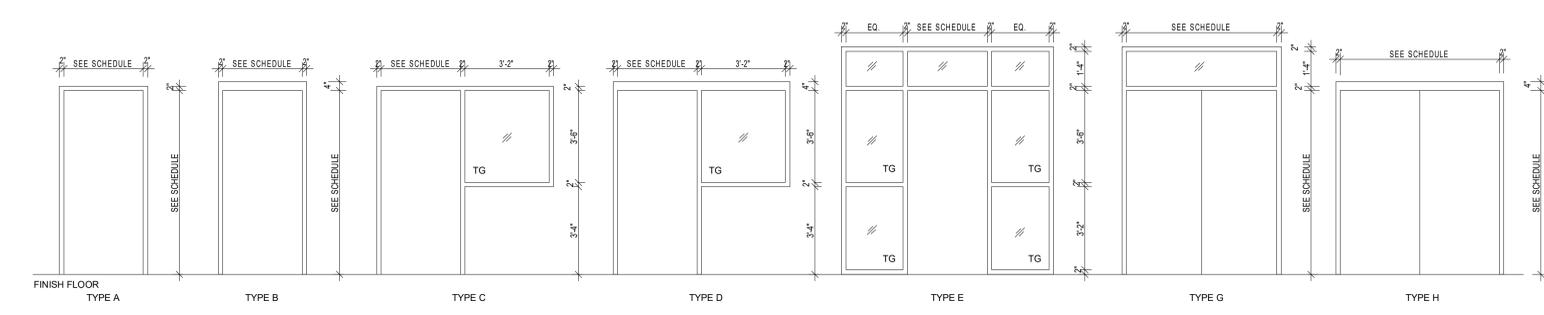
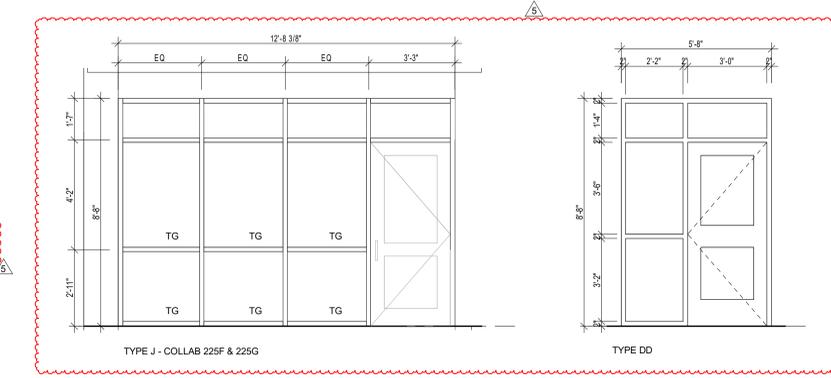
No.	Description	Date
1	AGENCY REVIEW	11-11-22
5	ADDENDUM 3	02-14-23

SECTION DETAILS



DOOR AND FRAME SCHEDULE BASEMENT & FIRST FLOOR														
NUMBER	ROOM NAME	DOOR			HDWR	DOOR		FRAME					REMARKS	
		TYPE	MATL	FINISH		LABEL	MATL	TYPE	FINISH	HEAD	JAMB	SILL		
BASEMENT														
010A	GEN. STORAGE	(PR) 4'-0" x 7'-0"	F (PAIR)	HM	PAINT	6.1		HM	A	PAINT	E3	C3	S1	4, 7, 16,
010B	GEN. STORAGE	10'-0" X 9'-0"	CD	HM	PAINT	62.0		HM	N/A	PAINT	B4	A6	S6	
010C	GEN. STORAGE	3'-0" x 7'-0"	F	HM	PAINT	4.1		HM	A	PAINT	E3	C3	S1	7, 16,
011	GEN. STORAGE	3'-0" X 7'-0"	F	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S8	
012	GEN. STORAGE	3'-0" X 7'-0"	F	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S8	
013A	CONFERENCE ROOM	3'-0" X 7'-0"	G	WD	STAIN	36.0		HM	A	PAINT	E4	C4	S8	
013B	CONFERENCE ROOM	3'-0" X 7'-0"	G	WD	STAIN	36.0		HM	A	PAINT	E4	C4	S8	
014	GEN. STORAGE	3'-0" X 7'-0"	F	WD	STAIN	46.0		HM	A	PAINT	E4	C4	S8	
015	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.2		HM	A	PAINT	E4	C4	S11	
016	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.1		HM	A	PAINT	E4	C4	S11	
A108	GEN. STORAGE	3'-0" X 7'-0"	F	WD	STAIN	34.0		HM	A	PAINT	E4	C4	S8	
1ST FLOOR														
100A	VESTIBULE	(PR) 3'-0" X 7'-0"	FG (PAIR)	AL	ANODIZED	3.0		AL	-	ANODIZED	H1	J1	S3	4, 11, 16, 17
100B	VESTIBULE	(PR) 3'-0" X 7'-0"	FG (PAIR)	AL	ANODIZED	1.0		AL	-	ANODIZED	H1	J1	S3	4, 11, 16,
100C	VESTIBULE	(PR) 3'-0" X 7'-0"	FG (PAIR)	AL	ANODIZED	16.0		AL	-	ANODIZED	H1	J1	S17	4, 11, 16,
100D	VESTIBULE	(PR) 3'-0" X 7'-0"	FG (PAIR)	AL	ANODIZED	16.0		AL	-	ANODIZED	H1	J1	S17	4, 11, 16,
101A	SECURITY CONFERENCE	3'-0" x 7'-0"	FG	AL	ANODIZED	14.0		AL	-	ANODIZED	H1	J1	S20	11
101C	SECURITY CONFERENCE	3'-0" x 7'-0"	N	HM	PAINT	8.0		HM	A	PAINT	H1	C4	S3	
102	NURSE	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	C	PAINT	E4	C4	S12	
103	HEALTH ROOM	3'-0" X 7'-0"	G	WD	STAIN	44.0		HM	B	PAINT	E3	C3	S21	
103A	TLT	3'-0" X 7'-0"	F	WD	STAIN	26.0		HM	A	PAINT	E4	C4	S11	
103B	HEALTH ROOM	3'-0" x 7'-0"	N	HM	PAINT	8.0		HM	B	PAINT	E1	C1	S3	
104A	RESOURCE OFFICERS	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	B	PAINT	E3	C3	S20	19
104B	RESOURCE OFFICERS	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
105	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	46.0		HM	A	PAINT	E4	C4	S13	
106	RECORDS	3'-0" X 7'-0"	G	WD	STAIN	49.0		HM	A	PAINT	E4	C4	S13	
107	OFFICE	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
108	COUNSELOR	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
109	REGISTRAR	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
110	OFFICE	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
111	STORAGE	3'-0" X 7'-0"	F	HM	PAINT	49.0		HM	B	PAINT	E3	C3	S21	
112	ELEC	3'-0" X 7'-0"	F	HM	PAINT	53.0		HM	B	PAINT	E3	C3	S6	
113	AP #2	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	-	PAINT	E4	C4	S13	
114	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.0		HM	A	PAINT	E4	C4	S8	
115	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.0		HM	A	PAINT	E4	C4	S8	
116	CORRIDOR	3'-0" X 7'-0"	G	WD	STAIN	39.0		HM	B	PAINT	E3	C3	S20	
120A	RECEPTION	3'-0" X 7'-0"	FG	AL	ANODIZED	14.0		AL	-	ANODIZED	H1	J1	S20	11
120B	RECEPTION	3'-0" X 7'-0"	G	WD	STAIN	39.0		HM	D	PAINT	E3	C3	S20	
120C	RECEPTION	3'-0" X 7'-0"	G	WD	STAIN	39.0		HM	A	PAINT	E4	C4	S13	
121	PRINCIPAL	3'-0" X 7'-0"	G	WD	STAIN	33.0		HM	B	PAINT	E3	C3	S20	
121A	TLT	3'-0" X 7'-0"	F	WD	STAIN	26.0		HM	A	PAINT	E4	C4	S8	
121B	PRINCIPAL	3'-0" X 7'-0"	G	WD	STAIN	31.0		HM	A	PAINT	E4	C4	S13	
122A	CONFERENCE	3'-0" X 7'-0"	G	WD	STAIN	34.0		HM	A	PAINT	E4	C4	S13	
122B	CONFERENCE	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
123	WORK ROOM / MAIL ROOM	3'-0" X 7'-0"	G	WD	STAIN	36.0		HM	A	PAINT	E4	C4	S22	
124	SEC. / FIN. SEC.	3'-0" X 7'-0"	G	WD	STAIN	29.0		HM	A	PAINT	E4	C4	S13	
125	TEACHER LOUNGE	3'-0" X 7'-0"	G	WD	STAIN	40.0		HM	A	PAINT	E4	C4	S22	
125A	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.1		HM	A	PAINT	E4	C4	S11	
125B	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.2		HM	A	PAINT	E4	C4	S11	
126	CUST	3'-0" X 7'-0"	F	HM	PAINT	53.0		HM	B	PAINT	E3	C3	S6	
127	CORRIDOR	3'-0" X 7'-0"	G	WD	STAIN	41.0		HM	B	PAINT	E3	C3	S20	
128		2'-0" X 7'-0"	F	HM	PAINT	48.0		HM	B	PAINT	E3	C3	S10	
130	STORAGE ROOM	3'-0" X 7'-0"	F	WD	STAIN	53.0		HM	B	PAINT	E3	C3	S20	
131		2'-0" X 7'-0"	F	HM	PAINT	48.0		HM	B	PAINT	E3	C3	S10	
133	ISS	3'-0" X 7'-0"	N	HM	PAINT	54.0		HM	B	PAINT	E3	C3	S21	
134	MDF	3'-0" X 7'-0"	F	WD	STAIN	49.0		HM	B	PAINT	E3	C3	S6	
135	STORAGE 6	3'-0" X 7'-0"	F	WD	STAIN	49.0		HM	B	PAINT	E3	C3	S6	
136	RESOURCE 6	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN	55.0		HM	E	PAINT	H1	J1	S21	
137A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	A	PAINT	E4	C4	S12	
137B	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	A	PAINT	E4	C4	S12	
137C	STEM / CPU LAB	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN	40.0		HM	E	PAINT	E3	C3	S22	
137D	STEM / CPU LAB	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN	57.0		HM	E	PAINT	H1	J1	S21	
138	IDF	3'-0" X 7'-0"	F	HM	PAINT	51.1		HM	B	PAINT	E3	C3	S6	
139	STORAGE	4'-0" X 7'-0"	F	HM	PAINT	38.0		HM	B	PAINT	E3	C3	S6	
140	TEACHER WORKROOM	3'-0" X 7'-0"	G	WD	STAIN	40.0		HM	C	PAINT	E3	C3	S21	
140A	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.0		HM	A	PAINT	E4	C4	S11	
140B	TLT	3'-0" X 7'-0"	F	WD	STAIN	28.0		HM	A	PAINT	E4	C4	S23	
141		2'-0" X 7'-0"	F	HM	PAINT	48.0		HM	B	PAINT	E3	C3	S6	
143		2'-0" X 7'-0"	F	HM	PAINT	48.0		HM	B	PAINT	E3	C3	S6	
148A	WATER HEATER / MECH	(PR) 3'-0" x 7'-0"	F (PAIR)	HM	PAINT	6.0		HM	H	PAINT	E1	C1	S1	4, 16
148B	WATER HEATER / MECH	3'-0" X 7'-0"	F	HM	PAINT	4.0		HM	B	PAINT	E1	C1	S1	16
149A	ELECTRICAL	3'-0" X 7'-0"	F	HM	PAINT	49.0		HM	B	PAINT	E3	C3	S6	
149B	ELECTRICAL	(PR) 3'-0" x 7'-0"	FL (PAIR)	HM	PAINT	6.0		HM	H	PAINT	E1	C1	S1	4, 16
150	ELEC	3'-0" X 7'-0"	F	HM	PAINT	53.0	90 MIN	HM	B	PAINT	E3	C3	S10	
151	MECHANICAL	(PR) 3'-0" x 7'-0"	F (PAIR)	HM	PAINT	13.0		HM	H	PAINT	E1	C1	S1	4
152	MECHANICAL	(PR) 3'-0" x 7'-0"	F (PAIR)	HM	PAINT	13.0		HM	H	PAINT	E1	C1	S1	4
A001A	CORRIDOR	(PR) 3'-0" x 7'-0"	N/B	AL	ANODIZED	1.0		AL	G	ANODIZED	E1	C1	S3	4, 16
A001C	VESTIBULE	(PR) 3'-0" x 7'-0"	N/B	AL	ANODIZED	16.0		AL	G	ANODIZED	H1	J1	S19	4, 5, 7, 16
A001D	CORRIDOR	(PR) 3'-0" x 7'-0"	CC	HM	PAINT	24.0	90 MIN	HM	H	PAINT	E2	C2	S19	4, 5, 7, 16
A001E	CORRIDOR	(PR) 4'-0" x 7'-0"	F (PAIR)	HM	PAINT	24.0	90 MIN	HM	H	PAINT	E2	C2	S19	4, 5, 7, 16
A001F	CORRIDOR	(PR) 3'-0" x 7'-0"	N/B	AL	ANODIZED	1.0		AL	G	ANODIZED	H1	J1	S1	4, 16
A100	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	49.0		HM	B	PAINT	E3	C3	S20	
A101	EXCEPTIONAL SUITE	3'-0" X 7'-0"	N	WD	STAIN	54.0		HM	B	PAINT	E3	C3	S21	
A101A	EXCEPTIONAL SUITE	3'-0" X 7'-0"	N	WD	STAIN	36.0		HM	B	PAINT	E3	C3	S12	
A101B	EXCEPTIONAL SUITE	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	B	PAINT	E3	C3	S12	
A101C	TLT	3'-0" X 7'-0"	F	WD	STAIN	27.0		HM	B	PAINT	E3	C3	S7	
A102	EXCEPTIONAL	3'-0" X 7'-0"	N	WD	STAIN	54.0		HM	B	PAINT	E3	C3	S21	
A103	FOREIGN LANGUAGE ARTS	3'-0" X 7'-0"	N	WD	STAIN	54.0		HM	B	PAINT	E3	C3	S21	
A104	ART	3'-0" X 7'-0"	N	WD	STAIN	55.0		HM	B	PAINT	E3	C3	S6	
A104A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	34.0		HM	B	PAINT	E3	C3	S10	
A104B	KILN	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	B	PAINT	E3	C3	S10	
A104C	ART	3'-0" X 7'-0"	N	HM	PAINT	5.0		HM	B	PAINT	E1	C1	S1	16
A105	CHORUS	48" x 84"	N2	WD	PAINT	17.1		HM	B	STAIN	E3	C3	S21	16
A105A	OFFICE	3'-0" X 7'-0"	G	WD	STAIN	32.0		HM	B	PAINT	E3	C3	S12	
A105AB	OFFICE	3'-0" X 7'-0"	G	WD	STAIN	33.0		HM	B	PAINT	E3	C3	S21	
A105B	LIBRARY	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	B	PAINT	E3	C3	S12	
A105C	STORAGE	3'-0" X 7'-0"	F	WD	STAIN	36.0		HM	B	PAINT	E3</			

DOOR AND FRAME SCHEDULE SECOND FLOOR														
NUMBER	ROOM NAME	DOOR					FRAME						REMARKS	
		SIZE	TYPE	MATL	FINISH	LABEL	HDWR	MATL	TYPE	FINISH	HEAD	JAMB		SILL
2ND FLOOR														
201	TESTING COORD.	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
202A	TESTING	3'-0" X 7'-0"	G	WD	STAIN		39.0	HM	B	PAINT	E3	C3	S20	
202B	TESTING	3'-0" X 7'-0"	G	WD	STAIN		34.0	HM	A	PAINT	E4	C4	S13	
203	COUNSELOR	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
204	COUNSELOR	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
205A	ASST PRIN #1	3'-0" X 7'-0"	G	WD	STAIN		33.0	HM	C	PAINT	E3	C3	S20	
205B	ASST PRIN #1	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
206	STORAGE	3'-0" X 7'-0"	F	HM	PAINT		53.0	HM	B	PAINT	E3	C3	S21	
207	STORAGE	3'-0" X 7'-0"	F	HM	PAINT		53.0	HM	B	PAINT	E3	C3	S21	
208	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S8	
209	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S8	
210	CONF	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	A	PAINT	E4	C4	S13	
210C	CORRIDOR	(PR) 4'-0" X 7'-0"	F (PAIR)	HM	PAINT	90 MIN	24.0	HM	H	PAINT	E2	C2	S19	4, 5, 7, 16
211	COUNSELOR	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
212	OFFICE STORAGE	3'-0" X 7'-0"	F	WD	STAIN		36.0	HM	A	PAINT	E4	C4	S13	
213	PSYCH	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
214	SOC. WORK	3'-0" X 7'-0"	G	WD	STAIN		29.0	HM	A	PAINT	E4	C4	S13	
215	TESTING COORD.	3'-0" X 7'-0"	F	WD	STAIN		36.0	HM	A	PAINT	E4	C4	S22	
216A	GUIDANCE	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		40.0	HM	E	PAINT	H1	J1	S20	
216B	GUIDANCE	3'-0" X 7'-0"	G	WD	STAIN		44.0	HM	B	PAINT	E3	C3	S20	
217	CORRIDOR	2'-0" X 7'-0"	F	HM	PAINT		48.0	HM	B	PAINT	E3	C3	S6	
219A	COLLAB	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		55.0	HM	E	PAINT	H1	J1	S20	
219B	COLLAB	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		55.0	HM	E	PAINT	H1	J1	S20	
220	CUST	3'-0" X 7'-0"	F	HM	PAINT		49.0	HM	B	PAINT	E3	C3	S6	
220C	CORRIDOR	(PR) 4'-0" X 7'-0"	F (PAIR)	HM	PAINT	90 MIN	24.0	HM	H	PAINT	E2	C2	S19	4, 5, 7, 16
221	MECHANICAL	(PR) 3'-0" X 7'-0"	F (PAIR)	HM	PAINT	90 MIN	60.0	HM	H	PAINT	E2	C2	S6	
222	CORRIDOR	2'-0" X 7'-0"	F	HM	PAINT		48.0	HM	B	PAINT	E3	C3	S6	
224	TEACHER WORKROOM	3'-0" X 7'-0"	G	WD	STAIN		40.0	HM	D	PAINT	E3	C3	S21	
224A	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S7	
224B	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S7	
225	ELEC	3'-0" X 7'-0"	F	HM	PAINT		52.0	HM	B	PAINT	E3	C3	S9	
225A	IDF	3'-0" X 7'-0"	F	HM	PAINT		49.0	HM	B	PAINT	E3	C3	S9	
225F	COLLAB	3'-0" X 7'-0"	FG	WD	STAIN		54.1	HM	J	PAINT	E3	C3	S9	
225G	COLLAB	3'-0" X 7'-0"	FG	WD	STAIN		54.1	HM	J	PAINT	E3	C3	S9	
226	CUST	3'-0" X 7'-0"	F	HM	PAINT		53.0	HM	B	PAINT	E3	C3	S6	
227	TEACHER WORKROOM	3'-0" X 7'-0"	G	WD	STAIN		40.0	HM	D	PAINT	E3	C3	S21	
227A	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S7	
227B	TLT	3'-0" X 7'-0"	F	WD	STAIN		28.0	HM	A	PAINT	E4	C4	S7	
228	IDF	3'-0" X 7'-0"	F	WD	PAINT		51.1	HM	B	PAINT	E3	C3	S9	
229	CUST	3'-0" X 7'-0"	F	HM	PAINT		53.0	HM	B	PAINT	E3	C3	S6	
230	CORRIDOR	2'-0" X 7'-0"	F	HM	PAINT		48.0	HM	B	PAINT	E3	C3	S6	
232	STORAGE	3'-0" X 7'-0"	F	HM	PAINT		49.0	HM	B	PAINT	E3	C3	S6	
237	CORRIDOR	2'-0" X 7'-0"	F	HM	PAINT		48.0	HM	B	PAINT	E3	C3	S6	
238	ELEC	3'-0" X 7'-0"	F	HM	PAINT		49.0	HM	B	PAINT	E3	C3	S6	
238A	ELEC	3'-0" X 7'-0"	F	HM	PAINT		9.0	HM	B	PAINT	E1	C1	S6	22
241	STEM LAB	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		55.0	HM	E	PAINT	H1	J1	S21	
241A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
A201	CLASSROOM 8-1	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A202	CLASSROOM 8-2	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A203	CLASSROOM 8-3	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A204A	SCIENCE 8-1	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A204A1	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
A204B	SCIENCE 8-1	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A204B1	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		46.0	HM	B	PAINT	E3	C3	S12	
A205	CLASSROOM 8-4	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A206	RESOURCE 8	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		55.0	HM	E	PAINT	H1	J1	S21	
A207	CLASSROOM 8-5	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A208	CLASSROOM 8-6	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A209A	SCIENCE CLASSROOM 8-2	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A209A1	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
A209A2	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
A209B	SCIENCE CLASSROOM 8-2	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A209B1	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		46.0	HM	B	PAINT	E3	C3	S12	
A210A	SCIENCE CLASSROOM 8-3	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A210B	SCIENCE CLASSROOM 8-3	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
A211	CLASSROOM 8-8	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A212	CLASSROOM 8-7	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
A213	CLASSROOM 8-9	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B201	COLLAB	3'-0" X 7'-0"	FG	HM	PAINT		55.0	HM	E	PAINT	H1	J1	S20	
B201A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		34.0	HM	B	PAINT	E3	C3	S22	
B202	CLASSROOM 7-1	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B203A	CORRIDOR	3'-0" X 7'-0"	DD	WD	STAIN		54.0	HM	E	PAINT	H1	J1	S21	16
B203AA	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		34.0	HM	B	PAINT	E3	C3	S12	
B203AB	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		34.0	HM	B	PAINT	E3	C3	S12	
B203B	EXPLORING TECH SYSTEMS	3'-0" X 7'-0"	DD	WD	STAIN		54.0	HM	E	PAINT	H1	J1	S21	16
B204	CLASSROOM 7-2	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B205	CLASSROOM 7-3	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B206	CPU LAB	3'-0" X 7'-0"	DD	WD	STAIN		54.0	HM	E	PAINT	H1	J1	S21	16
B206A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		34.0	HM	B	PAINT	E3	C3	S12	
B207A	SCIENCE CLASSROOM 7-4	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B207A1	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
B207B	SCIENCE CLASSROOM 7-4	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B207B1	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		46.0	HM	B	PAINT	E3	C3	S12	
B208	CORRIDOR	3'-0" X 7'-0"	DD	WD	STAIN		54.0	HM	E	PAINT	H1	J1	S21	16
B208A	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
B209	CLASSROOM 7-5	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B210	RESOURCE 7	3'-0" X 7'-0"	FG (PAIR)	WD	STAIN		55.0	HM	E	PAINT	H1	J1	S21	
B211	CLASSROOM 7-6	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B212	CLASSROOM 7-9	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B213A	SCIENCE CLASSROOM 7-7	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B213A1	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
B213A2	SCIENCE PREP	3'-0" X 7'-0"	G	WD	STAIN		36.0	HM	B	PAINT	E3	C3	S12	
B213B	SCIENCE CLASSROOM 7-7	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B213B1	STORAGE	3'-0" X 7'-0"	F	WD	STAIN		46.0	HM	B	PAINT	E3	C3	S12	
B214A	SCIENCE CLASSROOM 7-8	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B214B	SCIENCE CLASSROOM 7-8	3'-0" X 7'-0"	N	HM	PAINT	SMK	56.0	HM	B	PAINT	E3	C3	S21	23
B215	CLASSROOM 7-11	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B216	CLASSROOM 7-10	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
B217	CLASSROOM 7-12	3'-0" X 7'-0"	N	HM	PAINT		54.0	HM	B	PAINT	E3	C3	S21	
ELEV	ELEV	7'-0" X 3'-6"	N/A	SS		45 MIN	-	-	-	-	-	-	-	
G007	MECHANICAL PENTHOUSE	(PR) 3'-0" X 7'-0"	F (PAIR)	HM	PAINT		12.0	HM	B	PAINT	E1	C1	S10	



NOTE: 1. ALL GLAZING IN EXTERIOR DOORS/FRAMES TO BE TYPE TIG, U.N.O.  
2. ALL GLAZING IN INTERIOR DOORS/FRAMES TO BE TYPE TG, U.N.O.

DOOR TYPE LEGEND

GENERAL NOTES

- WHEN LOCATING DOOR FRAMES WITHIN A WALL, THE FRAME SHALL BE LOCATED SO THAT THERE IS 1/8" MIN. CLEAR SPACE LOCATED ON THE LATCH SIDE ON A FRONT APPROACH PULL SIDE. THERE SHALL BE 12" MIN. ON THE LATCH SIDE FOR A FRONT APPROACH PUSH SIDE WHEN BOTH A CLOSER AND LATCH ARE PROVIDED.
- MATERIALS, FINISHES, AND INSTALLATION OF PRODUCTS REFERENCED IN THE SCHEDULE SHALL BE IN ACCORDANCE WITH REQUIREMENTS SPECIFIED IN THE RESPECTIVE PRODUCT SECTIONS.
- REFER TO PARTITION TYPES AS INDICATED ON SHEET A-001 TO DETERMINE FRAME DEPTH.
- GLAZING TYPE AT DOORS TO BE AS INDICATED ON SHEET A-602.
- ALL GLAZING IN AND ADJACENT TO DOORS SHALL COMPLY WITH SAFETY GLASS REQUIREMENTS PER 2018 NCSCB, CHAPTER 24, SECTION 2406



GENERAL NOTES

- A. WHEN LOCATING DOOR FRAMES WITHIN A WALL, THE FRAME SHALL BE LOCATED SO THAT THERE IS 18" MIN. CLEAR SPACE LOCATED ON THE LATCH SIDE ON A FRONT APPROACH PULL SIDE, THERE SHALL BE 12" MIN. ON THE LATCH SIDE FOR A FRONT APPROACH PUSH SIDE WHEN BOTH A CLOSER AND LATCH ARE PROVIDED.
- B. MATERIALS, FINISHES, AND INSTALLATION OF PRODUCTS REFERENCED IN THE SCHEDULE SHALL BE IN ACCORDANCE WITH REQUIREMENTS SPECIFIED IN THE RESPECTIVE PRODUCT SECTIONS.
- C. REFER TO PARTITION TYPES AS INDICATED ON SHEET A-001 TO DETERMINE FRAME DEPTH.
- D. GLAZING TYPE AT DOORS TO BE AS INDICATED ON SHEET A-602.
- E. ALL GLAZING IN AND ADJACENT TO DOORS SHALL COMPLY WITH SAFETY GLASS REQUIREMENTS PER 2006 IBC, CHAPTER 24, SECTION 2406.
- F. ELECTRIFIED HARDWARE: COORDINATE ELECTRICAL REQUIREMENTS WITH DIVISION 26.
- G. ALARMS AND DOOR MONITORING: COORDINATE WITH DIVISION 28.
- H. OPENING SIZES INDICATED REFER TO DOOR OPENING DIMENSIONS INSIDE OF FRAME.
- I. ALL SMOKE CONTROL DOORS SHALL MEET THE REQUIREMENTS OF 2006 IBC, CHAPTER 7, SECTION 715 AND BE 'S' LABELED PER SECTION 715.4.5.3. DOOR INSTALLATION TO BE IN ACCORDANCE WITH NFPA 105.
- J. CONTRACTOR SHALL LEAVE ALL LABELS ON GLASS UNTIL COMPLETION OF OSF INSPECTIONS.
- K. FOR TYPICAL INTERNAL DOOR SILL DETAILS, REFER TO FLOOR TRANSITION DETAILS.
- L. PROVIDE ROLLER WINDOW SHADES AT WINDOWS OF ALL EXTERIOR INSTRUCTIONAL SPACES AND OFFICES U.N.O.
- M. INTERIOR FRAMES SHALL BE HOLLOW METAL.
- N. EXTERIOR FRAMES SHALL BE ALUMINUM STOREFRONTS.

GLAZING TYPES

IG	INSULATED GLASS - LOW E CLEAR - TYPICAL EXTERIOR GLASS U.N.O.
IG-1	INSULATED GLASS - LOW E CLEAR - GREEN (VANCEVA 4667 TRANSPARENT)
TIG	INSULATED GLASS - LOW E CLEAR - BOTH LITES TEMPERED
FG	CLEAR FLOAT GLASS - TYPICAL INTERIOR GLASS U.N.O.
TG	CLEAR TEMPERED GLASS
SP	SPANDREL PANEL



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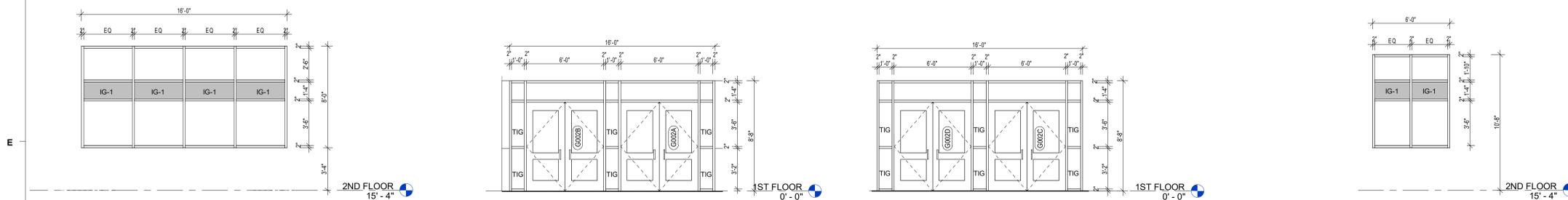
REVISIONS:

No.	Description	Date
5	ADDENDUM 3	02-14-23

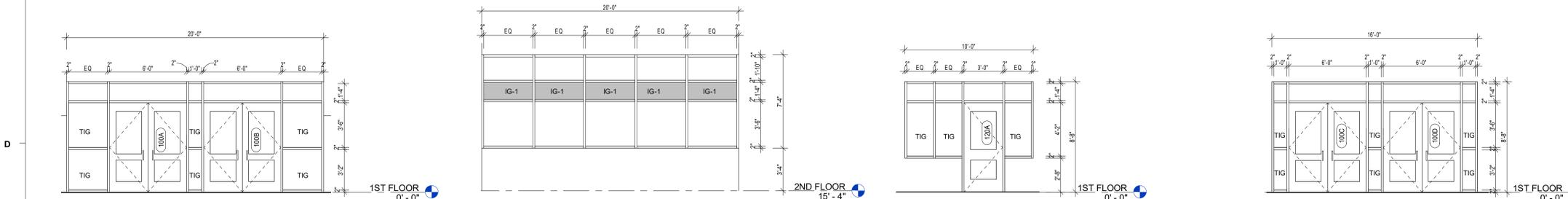
PROJECT: 9201-218240  
DATE: 01-12-2023

ALUMINUM STOREFRONT SCHEDULE & TYPE LEGEND

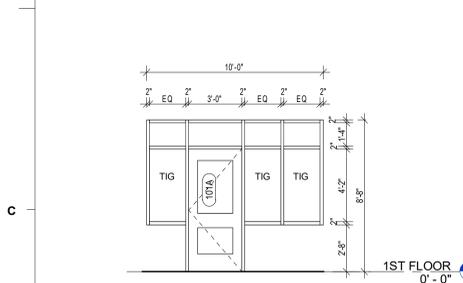
A-604



E1 ENTRY VESTIBULE 2ND FLOOR ASF  
E2 GYM ENTRY ASF  
E3 GYM VESTIBULE ASF  
E5 SIDE ENTRY ASF



D1 MAIN ENTRY ASF  
D2 MAIN ENTRY 2ND FLOOR ASF  
D3 VESTIBULE - E ASF  
D5 VESTIBULE - S ASF



C1 VESTIBULE - W ASF

TYPE N - HOLLOW METAL WINDOW AT ISS ROOM #133

WINDOW SCHEDULE			
MARK	ROUGH OPENING WIDTH	ROUGH OPENING HEIGHT	HEAD HEIGHT
A	6' - 0"	5' - 4"	VARIES
B	8' - 0"	5' - 4"	VARIES
C	10' - 0"	5' - 4"	VARIES
D	4' - 8"	10' - 8"	10' - 8"
E	3' - 4"	3' - 4"	6' - 8"
G	6' - 0"	2' - 0"	8' - 8"
K	4' - 3"	4' - 3"	10' - 2 1/2"
LA	6' - 0"	8' - 0"	VARIES
LB	8' - 0"	2' - 0"	VARIES
LC	6' - 0"	2' - 0"	VARIES
LD	2' - 0"	2' - 0"	13' - 2"
LE	6' - 0"	2' - 8"	12' - 0"
LF	4' - 0"	2' - 8"	12' - 0"
LG	3' - 4"	2' - 8"	12' - 0"
LH	10' - 0"	6' - 0"	13' - 4"
LJ	10' - 0"	2' - 0"	13' - 4"
LK	4' - 0"	1' - 4"	10' - 8"
M	4' - 0"	6' - 0"	8' - 0"
N	14' - 0"	4' - 0"	10' - 0"

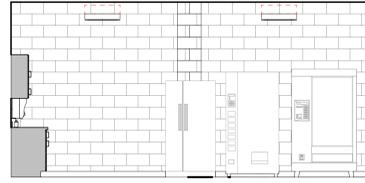
WINDOW TYPES LEGEND

1 2 3 4 5 6

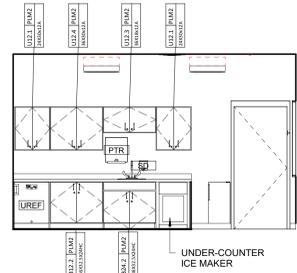
E  
D  
C  
B  
A



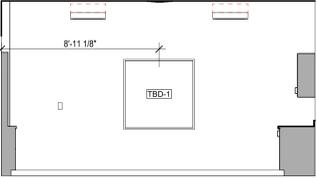
**E1** INT. ELEV. @ MAIL WORK ROOM 123 - E  
1/4" = 1'-0" REF: A1 / A-409



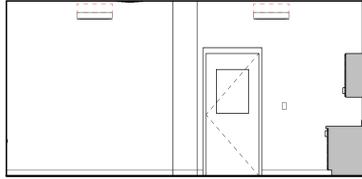
**E2** INT. ELEV. @ TEACHER LOUNGE 125 - W  
1/4" = 1'-0" REF: B3 / A-403



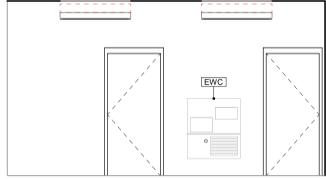
**E3** HEALTH ROOM CASEWORK 103  
1/4" = 1'-0" REF: A1 / A-409



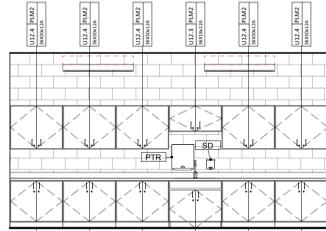
**D1** INT. ELEV. @ MAIL WORK ROOM 123 - S  
1/4" = 1'-0" REF: A1 / A-409



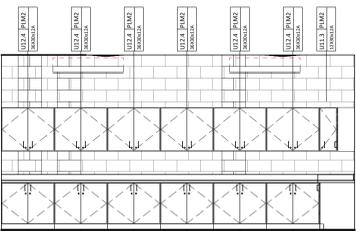
**D2** INT. ELEV. @ TEACHER LOUNGE 125 - E  
1/4" = 1'-0" REF: B3 / A-403



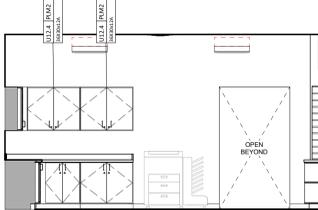
**D4** INT. ELEV. @ TEACHER LOUNGE 125 - N  
1/4" = 1'-0"



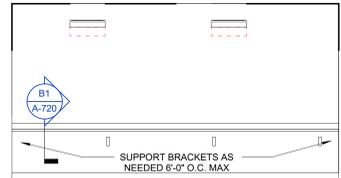
**D5** INT. ELEV. @ TEACHER LOUNGE 125 - S  
1/4" = 1'-0"



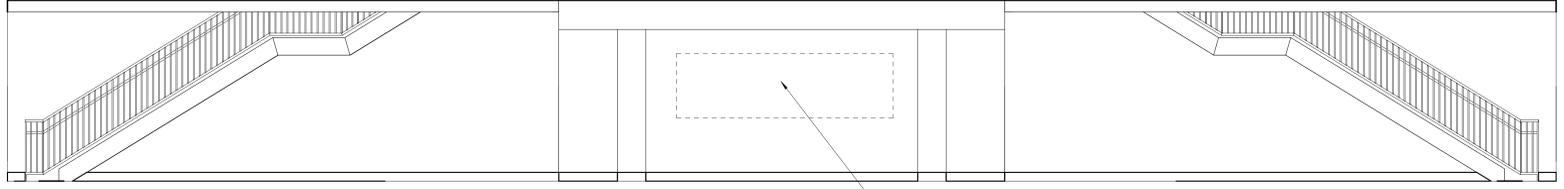
**C1** INT. ELEV. @ MAIL WORK ROOM 123 - W  
1/4" = 1'-0" REF: A1 / A-409



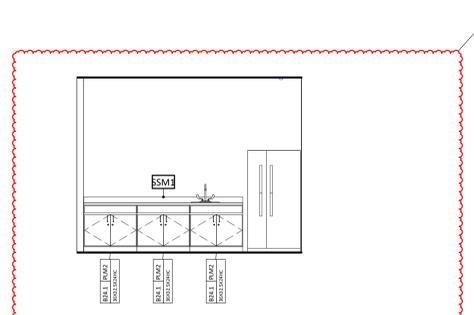
**B1** INT. ELEV. @ MAIL WORK ROOM 123 - N  
1/4" = 1'-0" REF: A1 / A-409



**B2** TESTING - NORTH  
1/4" = 1'-0"



**A1** CENTRAL CORRIDOR ELEVATION - SOUTH  
1/4" = 1'-0"



**A5** INT. ELEV. @ BASEMENT BREAK AREA  
1/4" = 1'-0"

**GENERAL ELEVATION NOTES**

- A. SEE FINISH LEGEND AND SCHEDULE (A700) FOR FINISHES
- B. SEE SHEET A601 - A602 FOR DOOR SCHEDULES
- C. ALL HOLLOW METAL FRAMES ARE 2" WIDE, PNT-7 U.N.O.
- D. WHERE WALL PAINT NOT NOTED USE PNT-2
- E. PROVIDE FINISH PANELS ON ALL EXPOSED CABINET SIDES; FINISH TO MATCH CABINET
- F. PROVIDE FILLER PANELS AS NEEDED/RECOMMENDED; FINISH TO MATCH CABINET
- G. SEE CASEWORK DETAILS ON A738 - A740
- H. GLASS PANELS BY OTHERS, N.I.C.
- I. ALL PAINT IN RESTROOMS TO BE EPOXY TO MATCH SPECIFIED COLOR, UNO.
- J. PAINT LINES SHOULD ALIGN WITH CMU JOINT LINES



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5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
DATE: 01-12-2023

**INTERIOR ELEVATIONS - ADMINISTRATION SUITE**

**A-700**



REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-22
5	ADDENDUM 3	02-14-23

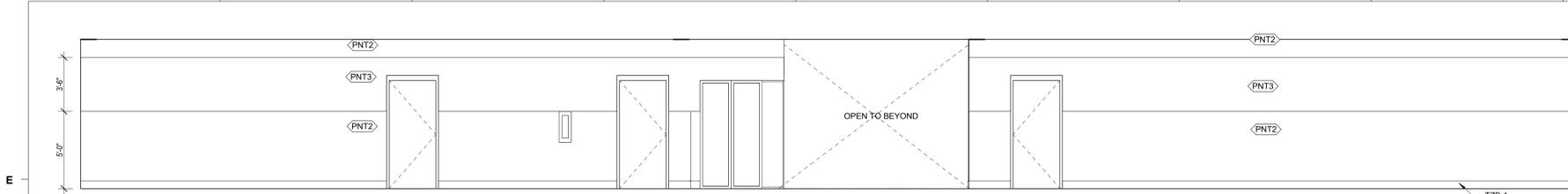
PROJECT: 9201-218240  
DATE: 01-12-2023

GENERAL ELEVATION NOTES

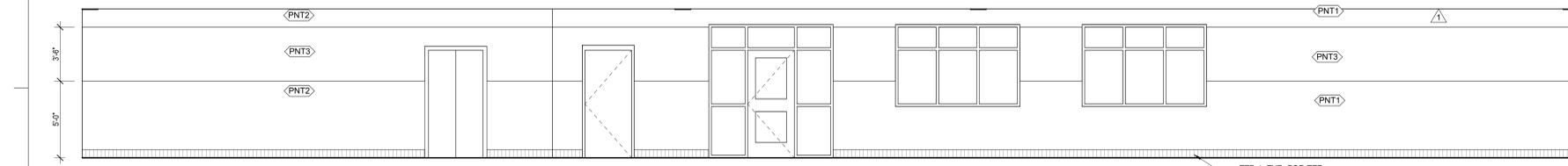
- A. SEE FINISH LEGEND AND SCHEDULE (A700) FOR FINISHES
- B. SEE SHEET A601 - A602 FOR DOOR SCHEDULES
- C. ALL HOLLOW METAL FRAMES ARE 2" WIDE, PNT-7 U.N.O.
- D. WHERE WALL PAINT NOT NOTED USE PNT-2
- E. PROVIDE FINISH PANELS ON ALL EXPOSED CABINET SIDES: FINISH TO MATCH CABINET
- F. PROVIDE FILLER PANELS AS NEEDED/RECOMMENDED; FINISH TO MATCH CABINET
- G. SEE CASEWORK DETAILS ON A738 - A740
- H. GLASS PANELS BY OTHERS, N.I.C.
- I. ALL PAINT IN RESTROOMS TO BE EPOXY TO MATCH SPECIFIED COLOR, UNO.
- J. PAINT LINES SHOULD ALIGN WITH CMU JOINT LINES

SHEET NOTES

- 1. 1" THICK BRUSHED ALUMINUM LETTERS ON 1" METAL STANDOFFS
- 2. AWP PANEL SIZES, MATERIAL, AND EXACT INSTALL LOCATIONS TO BE CONFIRMED BY ARCHITECT DURING SUBMITTAL PHASE



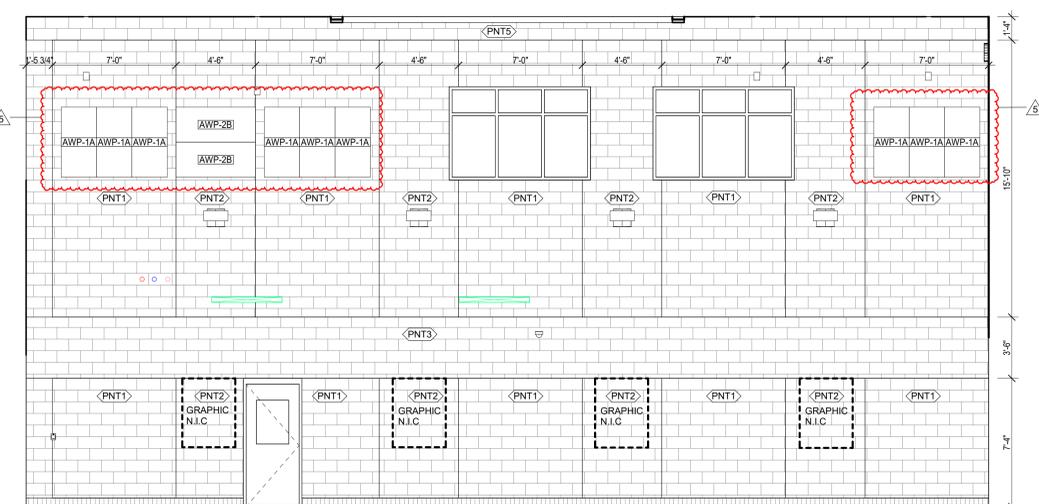
E1 INT. ELEV. @ CORRIDOR - N  
1/4" = 1'-0"



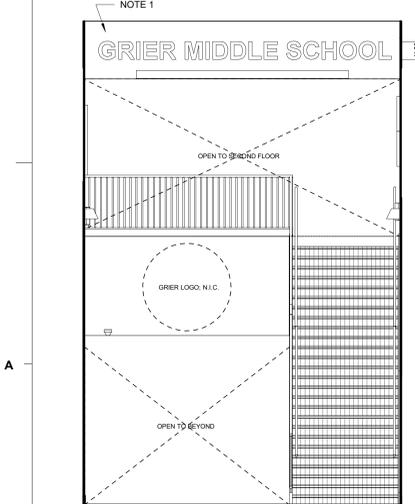
D1 INT. ELEV. @ CORRIDOR - S  
1/4" = 1'-0"



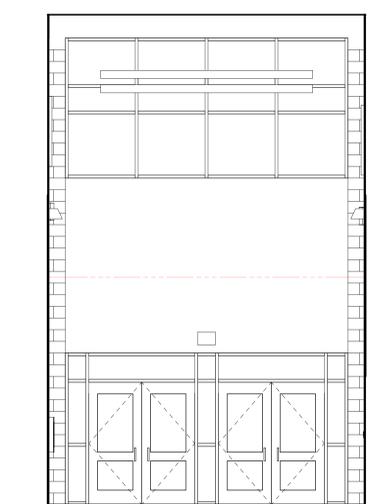
C1 INT. ELEV. @ ENTRY CORRIDOR - N  
1/4" = 1'-0"



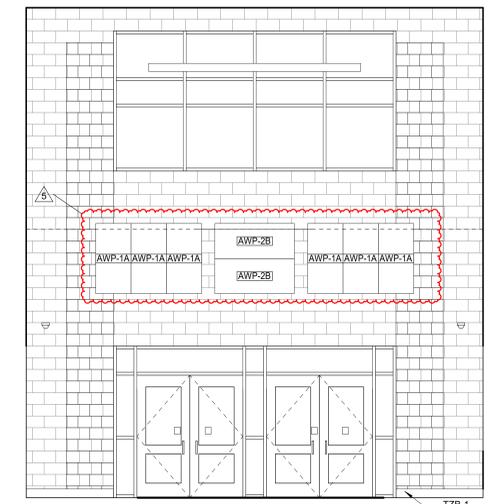
C3 INT. ELEV. @ ENTRY CORRIDOR - S  
1/4" = 1'-0"



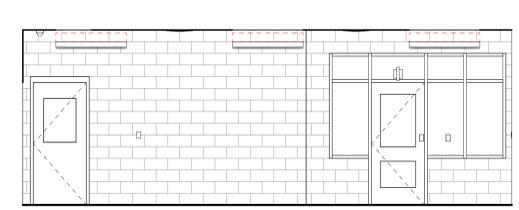
A1 INT. ELEV. @ ENTRY CORRIDOR - W  
1/4" = 1'-0"



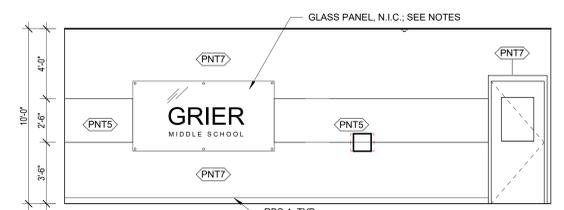
A2 INT. ELEV. @ ENTRY CORRIDOR - E  
1/4" = 1'-0"



A3 INT. ELEV. @ VESTIBULE - E  
1/4" = 1'-0" REF: A1 / A-409

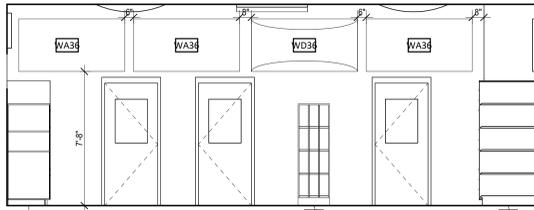


A4.2 INT. ELEV. @ RECEPTION 120 - N  
1/4" = 1'-0"

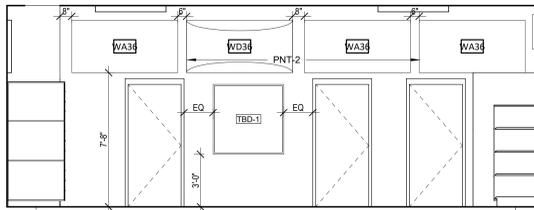


A4 INT. ELEV. @ RECEPTION 120 - S  
1/4" = 1'-0" REF: A1 / A-409

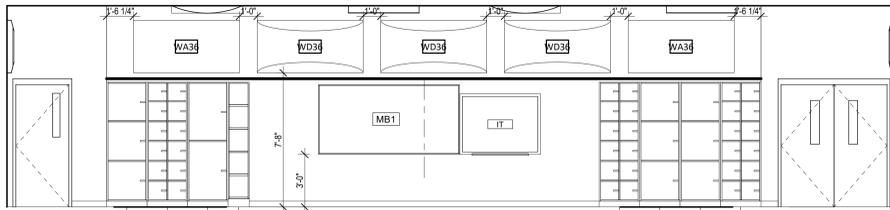
E  
D  
C  
B  
A



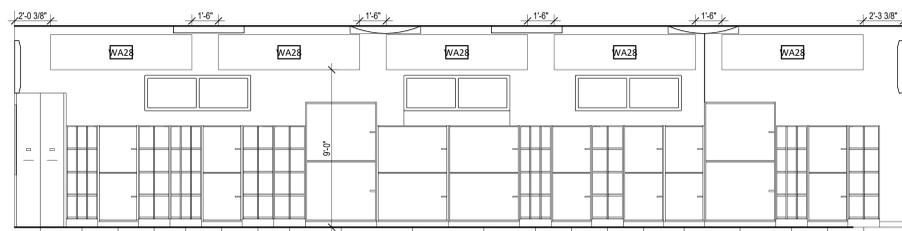
E1 INT. ELEV. @ BAND A106 - N  
1/4" = 1'-0"



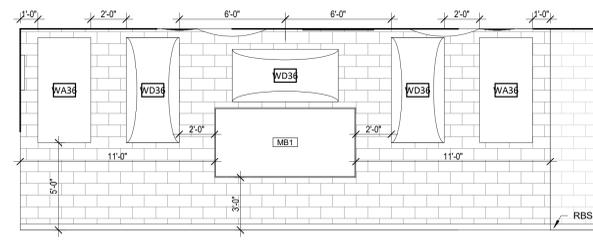
D1 INT. ELEV. @ BAND A106 - S  
1/4" = 1'-0"



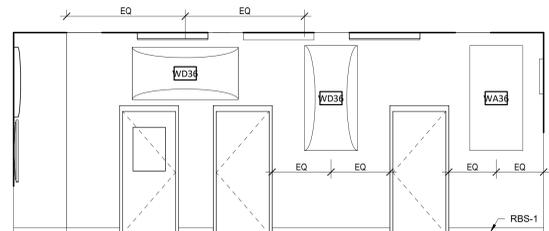
C1 INT. ELEV. @ BAND A106 - E  
1/4" = 1'-0"



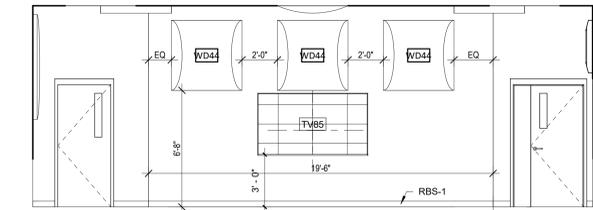
B1 INT. ELEV. @ BAND A106 - W  
1/4" = 1'-0"



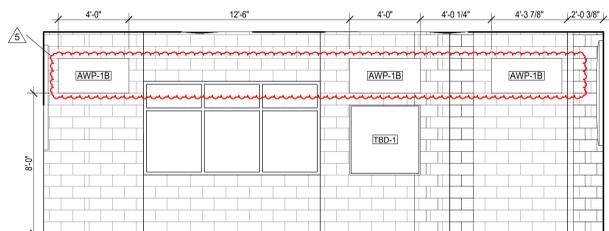
E3 INT. ELEV. @ CHORUS G012 - N  
1/4" = 1'-0"



D3 INT. ELEV. @ CHORUS G012 - S  
1/4" = 1'-0"



C3 INT. ELEV. @ CHORUS G012 - E  
1/4" = 1'-0"



B3 INT. ELEV. @ CHORUS G012 - W  
1/4" = 1'-0"



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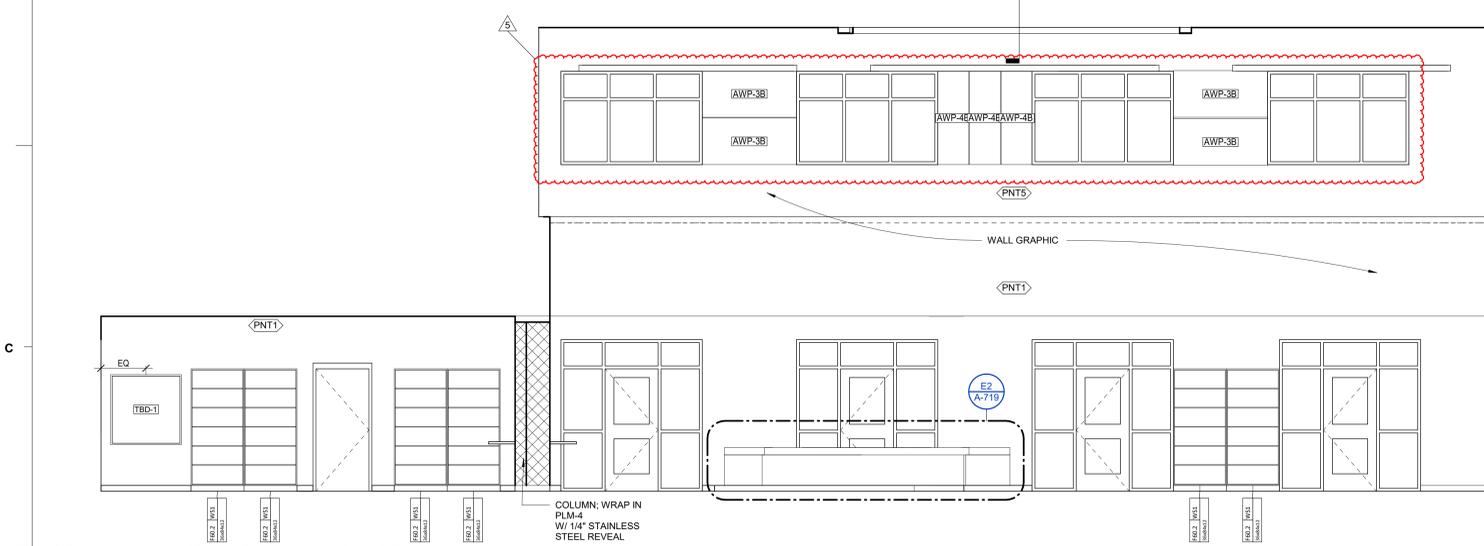
PROJECT: 9201-216240  
DATE: 01-12-2023

INTERIOR ELEVATIONS - BAND & CHORUS

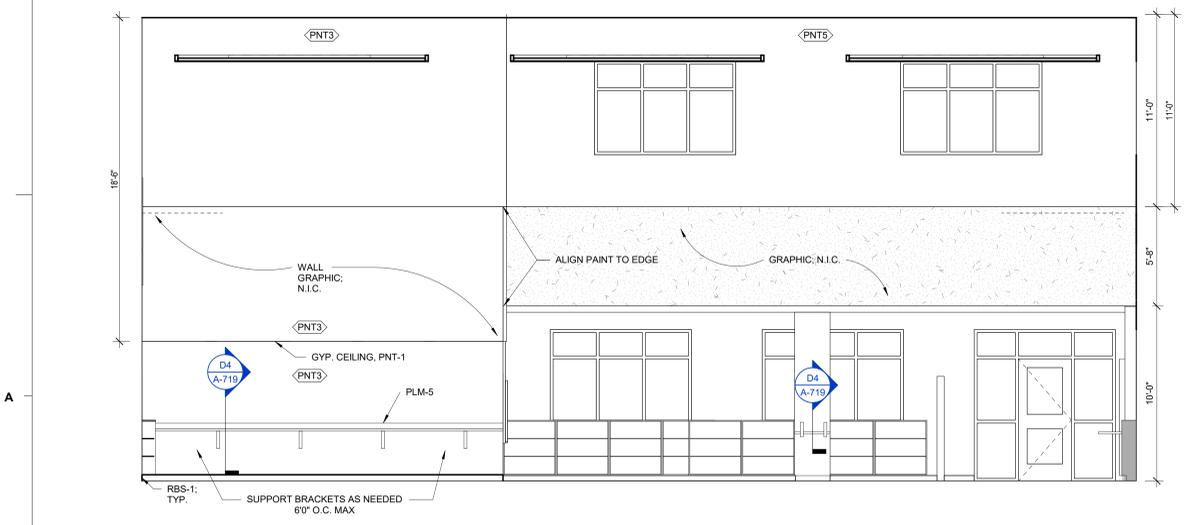
A-704



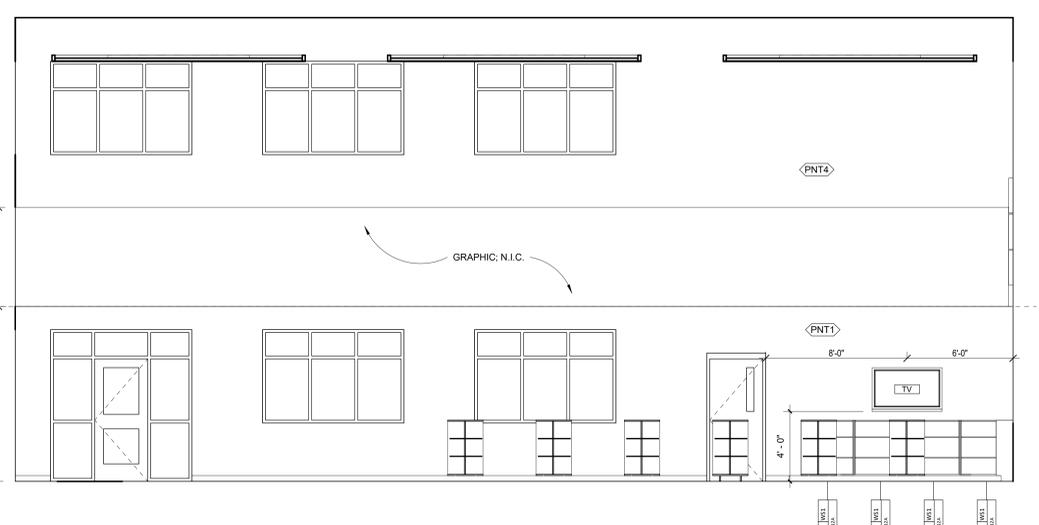
**D1** INT. ELEV. @ MEDIA CENTER M100 - W  
1/4" = 1'-0" REF: C1 / A-414



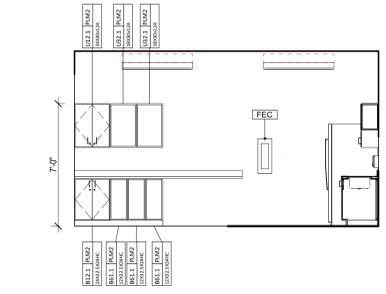
**B1** INT. ELEV. @ MEDIA CENTER M100 - E  
1/4" = 1'-0" REF: C1 / A-414



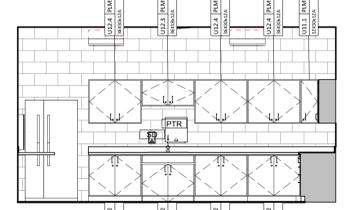
**A1** INT. ELEV. @ MEDIA CENTER M100 - N  
1/4" = 1'-0" REF: B1 / A-415



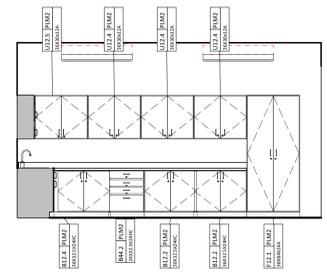
**A4** INT. ELEV. @ MEDIA CENTER M100 - S  
1/4" = 1'-0" REF: B1 / A-415



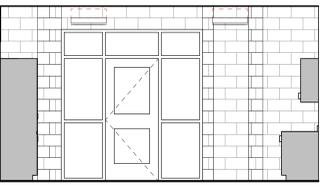
**D4** INT. ELEV. @ MEDIA WORK ROOM M102 - N  
1/4" = 1'-0"



**C4** INT. ELEV. @ MEDIA WORK ROOM M102 - E  
1/4" = 1'-0"



**D5** INT. ELEV. @ MEDIA WORK ROOM M102 - S  
1/4" = 1'-0"



**C5** INT. ELEV. @ MEDIA WORK ROOM M102 - W  
1/4" = 1'-0"

**GENERAL ELEVATION NOTES**

- A. SEE FINISH LEGEND AND SCHEDULE (A700) FOR FINISHES
- B. SEE SHEET A601 - A602 FOR DOOR SCHEDULES
- C. ALL HOLLOW METAL FRAMES ARE 2" WIDE, PNT-7 U.N.O.
- D. WHERE WALL PAINT NOT NOTED USE PNT-2
- E. PROVIDE FINISH PANELS ON ALL EXPOSED CABINET SIDES; FINISH TO MATCH CABINET
- F. PROVIDE FILLER PANELS AS NEEDED/RECOMMENDED; FINISH TO MATCH CABINET
- G. SEE CASEWORK DETAILS ON A738 - A740
- H. GLASS PANELS BY OTHERS; N.I.C.
- I. ALL PAINT IN RESTROOMS TO BE EPOXY TO MATCH SPECIFIED COLOR, UNO.
- J. PAINT LINES SHOULD ALIGN WITH CMU JOINT LINES



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No.	Description	Date
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
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**INTERIOR ELEVATIONS - MEDIA CENTER**

**A-705**



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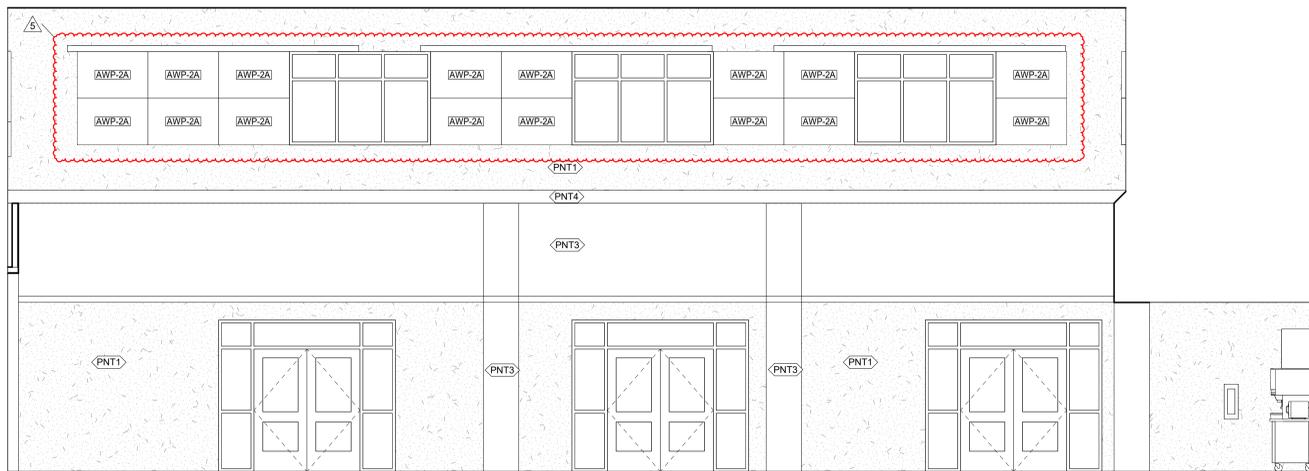
REVISIONS:

No.	Description	Date
5	ADDENDUM 3	02-14-23

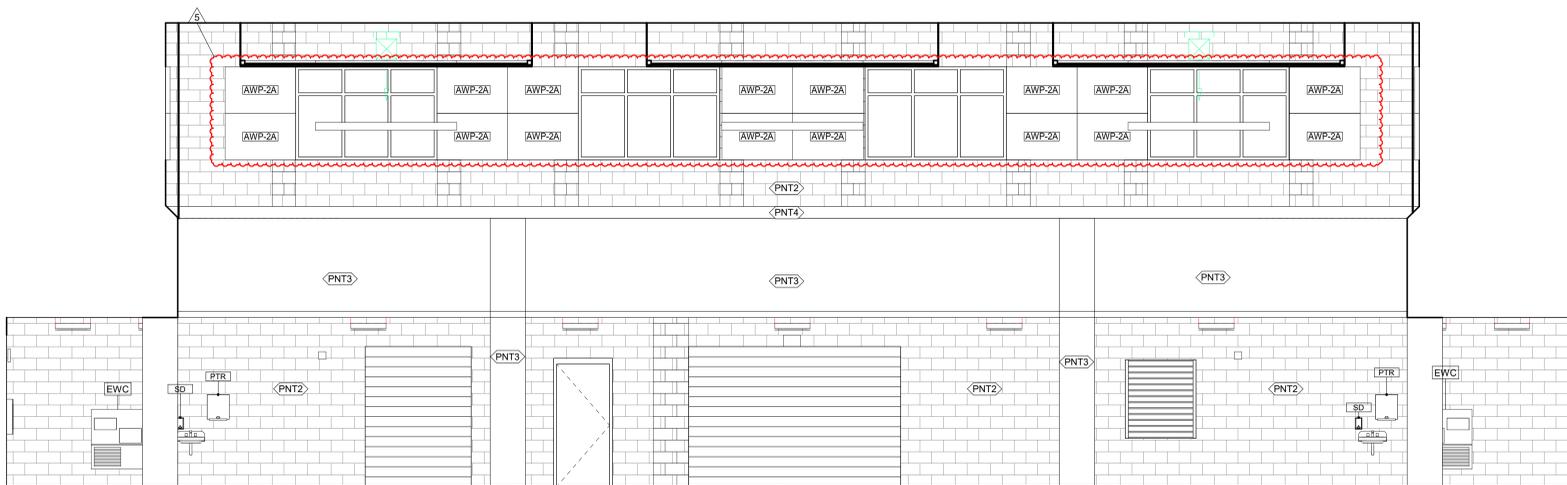
PROJECT: 9201-218240  
DATE: 01-12-2023

INTERIOR ELEVATIONS - CAFETERIA

**A-706**



**C1** INT. ELEV. @ CAFETERIA D100 - S  
1/4" = 1'-0"



**A1** INT. ELEV. @ CAFETERIA D100 - W  
1/4" = 1'-0"

1

2

3

4

5

6

E

D

C

B

A



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No.	Description	Date
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
 DATE: 01-12-2023

INTERIOR ELEVATIONS - CAFETERIA

A-707

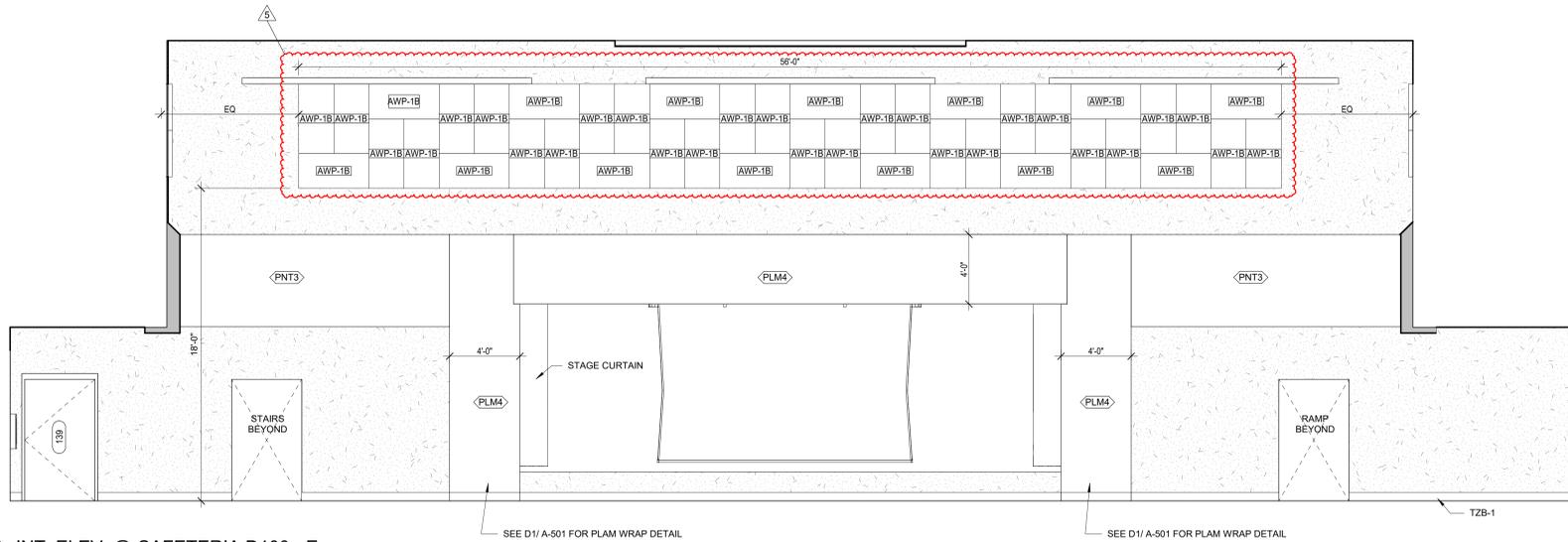
E

D

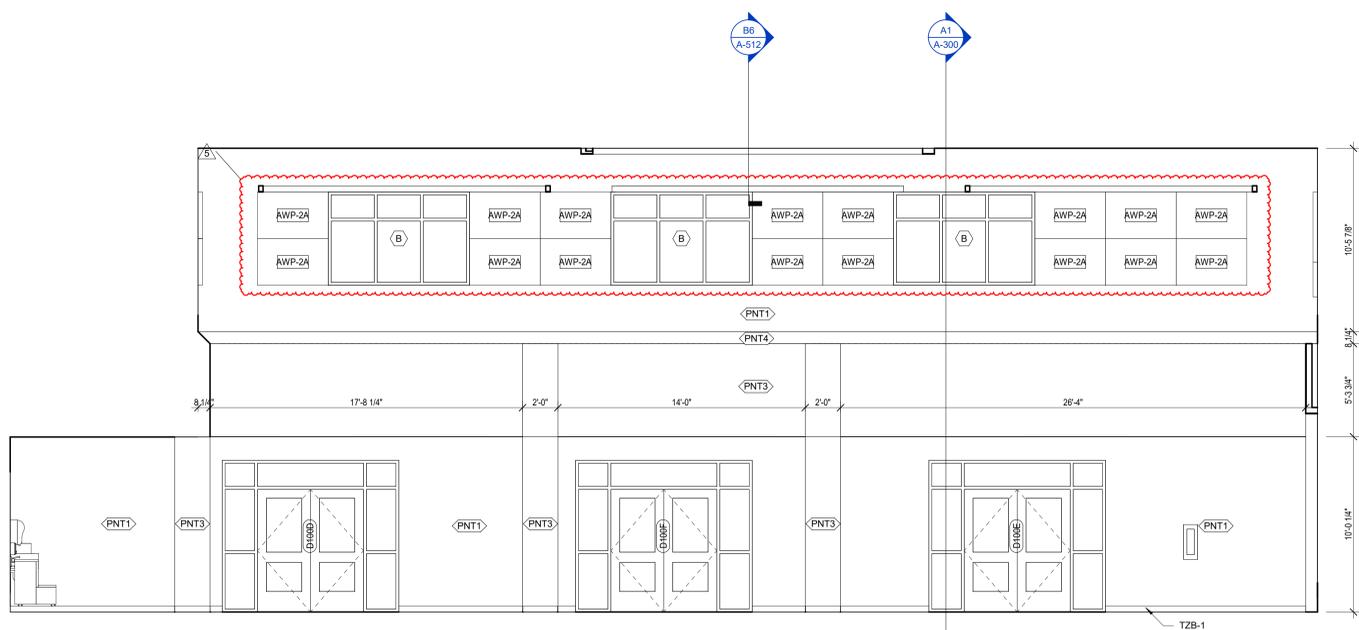
C

B

A



C1 INT. ELEV. @ CAFETERIA D100 - E  
 1/4" = 1'-0"



A1 INT. ELEV. @ CAFETERIA D100 - N  
 1/4" = 1'-0"



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No.	Description	Date
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
 DATE: 01-12-2023

INTERIOR ELEVATIONS - GYM

A-710

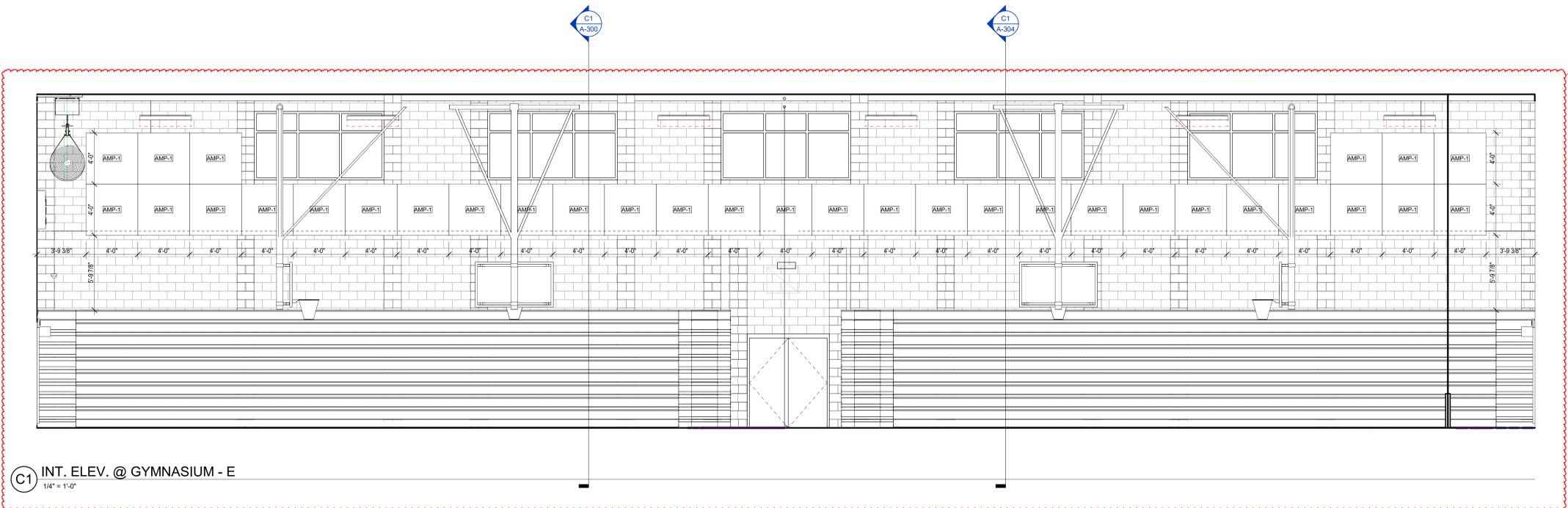
E

D

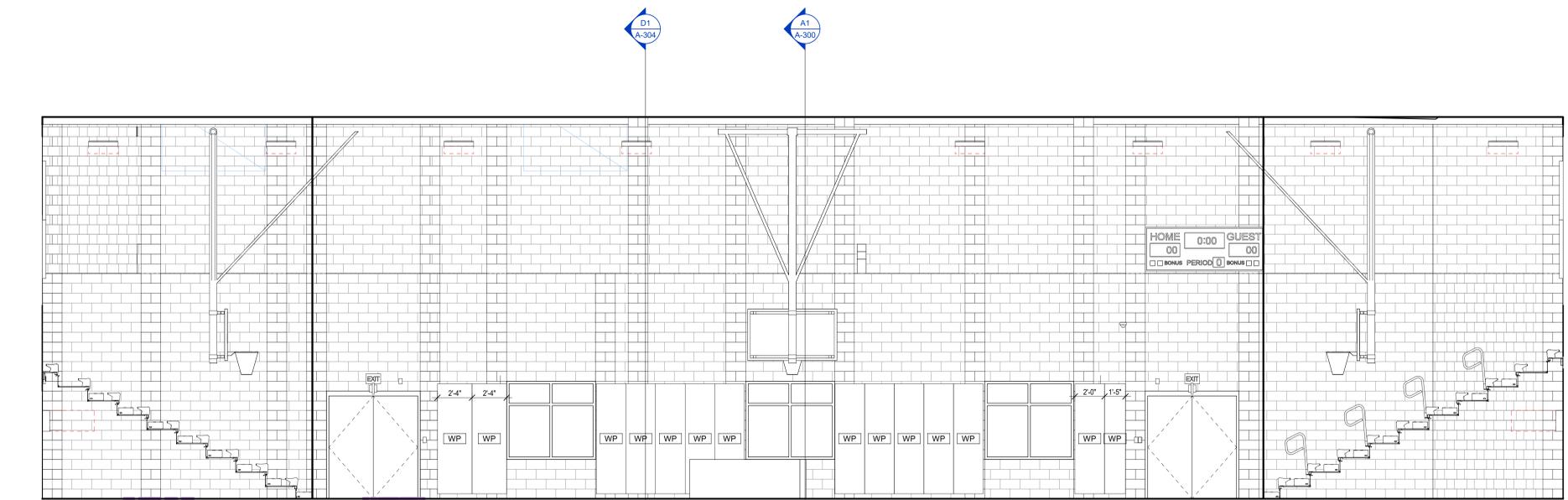
C

B

A



C1 INT. ELEV. @ GYMNASIUM - E  
 1/4" = 1'-0"



A1 INT. ELEV. @ GYMNASIUM - S  
 1/4" = 1'-0"

1

2

3

4

5

6

ROOM FINISH LEGEND									
MATERIAL CODE	DESCRIPTION	MANUFACTURER	PRODUCT NAME AND NUMBER	STYLE / PATTERN	FINISH	COLOR	SIZE	COMMENTS	CONTACT
DIVISION 6 WOOD AND PLASTICS									
CHW-1	CABINET HARDWARE	-	-	WIRE PULL	-	NICKEL	4"	-	-
EPC-1	EPOXY COUNTERTOP	-	-	-	-	BLACK	-	SCIENCE LABS SIGNAGE	-
GP-1	GLASS PANEL	-	-	-	-	-	PER ELEVATION	-	-
GRM-1	WIRE GROMMETS	-	-	-	-	-	-	-	-
PLM-1	PLASTIC LAMINATE	WILSONART	D90-60	NORTH SEA	MATTE FINISH	-	-	CLASSROOM COUNTERS	APRIL BRICKLE; BRICKLA@WILSONART.COM
PLM-2	PLASTIC LAMINATE	FORMICA	05786-NG	ASHWOOD OAK	NATURAL GRAIN TEXTURE	-	-	CLASSROOM CASEWORK, ADMIN, MEDIA, GUIDANCE	SHERI REID; SHERI.REID@FORMICA.COM; 704.534.7300
PLM-3	PLASTIC LAMINATE	WILSONART	4942-38	CRISP LINEN	FINE VELVET FINISH	-	-	CONCESSIONS, ADMIN CIRC. DESKS, GUIDANCE, MEDIA DESKS	APRIL BRICKLE; BRICKLA@WILSONART.COM
PLM-4	PLASTIC LAMINATE	WILSONART	7971K-12	UPTOWN WALNUT	SOFTGRAIN FINISH	-	-	CONCESSIONS, ADMIN CIRC. DESKS, CAFETERIA PLATFORM	APRIL BRICKLE; BRICKLA@WILSONART.COM
PLM-5	PLASTIC LAMINATE	WILSONART	Y0351-60	KALE LEAF	MATTE FINISH	-	-	ADMIN DESK, MEDIA CENTER COUNTERTOPS & DESK	APRIL BRICKLE; BRICKLA@WILSONART.COM
SSM-1	SOLID SURFACE MATERIAL	CORIAN	-	CARBON CONCRETE	-	-	-	RECEPTION DESK AND MEDIA CENTER COUNTERS	BARBRA DAVIS; BDAVIS@CHBRIGGS.COM; 704.954.8825
WS-1	WOOD SURFACE	-	WHITE OAK	-	PLAIN SAWN	STAIN TO MATCH WD-1	-	LIBRARY, SCIENCE, & MUSIC CASEWORK; PLATFORM SURROUND	-
DIVISION 8 DOORS AND WINDOWS									
DHW-1	DOOR HARDWARE FINISH	-	-	-	-	NICKLE	-	-	-
OOD-1	OVERHEAD COILING DOOR	-	-	-	-	RAL #	-	-	-
WD-1	WOOD DOOR	-	WHITE OAK	-	PLAIN SAWN	MATCH ARCH SAMPLE	-	INTERIOR WOOD DOORS	-
DIVISION 9 FINISHES - CEILINGS									
ACT-1	ACOUSTICAL CEILING TILE	ARMSTRONG	SCHOOL ZONE, FINE FISSURED, SQUARE LAY-IN GRID 15/16"	-	-	WHITE	24" x 24"	TYPICAL	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
ACT-2	ACOUSTICAL CEILING TILE	ARMSTRONG	GEORGIAN, SQUARE LAY-IN GRID 15/16"	-	-	WHITE	24" x 24"	FITNESS, WRESTLING	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
ACT-3	ACOUSTICAL CEILING TILE	ARMSTRONG	ULTIMA HEALTH ZONE, SQUARE LAY-IN 15/16"	-	-	WHITE	24" x 24"	KITCHEN	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
ACT-4	ACOUSTICAL CEILING TILE	ARMSTRONG	FINE FISSURED, SQUARE LAY-IN GRID 15/16"	-	-	BLACK	24" x 24"	MEDIA CENTER, CAFETERIA	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
APC-44	ACOUSTICAL CEILING TILE	WENGER	CONVEX DIFFUSER PANEL	-	-	WHITE	4" X 4"	BAND, CHORUS	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
SCT-1	SUSPENDED CEILING TRIM	ARMSTRONG	AXIOM CLASSIC TRIM	-	-	PNT-5 (GREEN)	12"H	CAFETERIA, MEDIA CENTER	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
SCT-2	SUSPENDED CEILING TRIM	ARMSTRONG	AXIOM CLASSIC TRIM	-	-	PNT-3 (YELLOW)	12"H	CAFETERIA, MEDIA CENTER	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
SCT-3	SUSPENDED CEILING TRIM	ARMSTRONG	AXIOM CLASSIC TRIM	-	-	GUN METAL	12"H	CAFETERIA, MEDIA CENTER	ANGELA DUNPHY; AEDUNPHY@ARMSTRONG.COM; 704.363.4979
DIVISION 9 FINISHES - FLOORS									
CPL-1	POLISHED CONCRETE	-	LEVEL 3	CLASS D	-	-	-	-	-
CPT-1	CARPET, TILE	SHAW CONTRACT	SATURATE TILE	5T109	-	TAUPE	9" X 36"	ADMIN, MEDIA CENTER; SEE A4/A-729 FOR INSTALL DETAILS	DAWN VAN DYKE; DAWN.VANDYKE@SHAWCONTRACT.COM; 704.668.7983
CPT-2	CARPET, TILE	SHAW CONTRACT	CHROMATONE TILE	5T444	-	LIME TAUPE	9" X 36"	ADMIN, MEDIA CENTER; SEE A4/A-729 FOR INSTALL DETAILS	DAWN VAN DYKE; DAWN.VANDYKE@SHAWCONTRACT.COM; 704.668.7983
CPT-3	CARPET, TILE	SHAW CONTRACT	SATURATE TILE	5T109	-	LIME	9" X 36"	MEDIA CENTER	DAWN VAN DYKE; DAWN.VANDYKE@SHAWCONTRACT.COM; 704.668.7983
CPT-4	CARPET, TILE	SHAW CONTRACT	SATURATE TILE	5T109	-	CITRON	9" X 36"	MEDIA CENTER	DAWN VAN DYKE; DAWN.VANDYKE@SHAWCONTRACT.COM; 704.668.7983
CSL-1	CONCRETE SEALER	SHERWIN WILLIAMS	SHERCRETE FLEXIBLE CONCRETE - WATERPROOFER	-	-	CLEAR	-	CUSTODIAL, STORAGE, ELEC., FIELD HOUSE	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
GTf-1	GROUT, FLOORING	-	-	-	-	SELECTED BY ARCH WHEN BRAND IS DETERMINED	-	ALL PTF	-
PTF-1	PORCELAIN TILE FLOORING	CROSSVILLE	SHADES BY CROSSVILLE	-	HONED	THUNDER UPS	12" x 24"	PRIVATE RR, INSTALL 1/3 OFFSET (ASHLAR)	MELISSA HSIN; MHSIN@CROSSVILLESTUDIO.S.COM; 704.968.2829
RF-1	EPOXY FLOORING	STONHARD	STONSHIELD SLT	-	ORANGE PEEL SURFACE TEXTURE	FLAGSTONE	-	SHOWER LOCATIONS, SLIP RESISTANT	DAVID MACHANIC; 336.706.7230
RSA-1	RUBBER STAIR ACCESSORIES	JOHNSONITE/TARKETT	CUBIS VICUTR	-	-	48 GREY	-	CONTINUOUS RISER/TREAD	JESSICA KESSER; JESSICA.KESSER@TARKETT.COM; 704.724.1310
RSF-1	RESILIENT SHEET FLOORING	PROTECTALL	-	-	-	MATTE GRAY (DARK)	5' x 8'	KITCHEN, RAPID WELD	ALISON HAIR; AHAIR@PROTECT-ALLFLOORING.COM; 470.281.0121
RTF-1	SOLID VINYL TILES	AMERICAN BILTRITE	TEXAS GRANITE	VTG-30	-	WHITE/GREY	-	WHITE ACCENT - CLASSROOM FLOORS	GREG CAPELL; GREG.CAPELL@ALLSOUTHFLORING.COM; 704.942.7609
RTF-2	SOLID VINYL TILES	AMERICAN BILTRITE	TEXAS GRANITE	VTG-37	-	GREY	-	GREY ACCENT - CLASSROOM FLOORS	GREG CAPELL; GREG.CAPELL@ALLSOUTHFLORING.COM; 704.942.7609
RTF-3	SOLID VINYL TILES	AMERICAN BILTRITE	TEXAS GRANITE	VTG-19	-	HONEST BEIGE	-	YELLOW ACCENT - CLASSROOM FLOORS	GREG CAPELL; GREG.CAPELL@ALLSOUTHFLORING.COM; 704.942.7609
RTF-4	SOLID VINYL TILES	AMERICAN BILTRITE	TEXAS GRANITE	VTG-81	-	KERSHAW GREEN	-	GREEN ACCENT - CLASSROOM FLOORS	GREG CAPELL; GREG.CAPELL@ALLSOUTHFLORING.COM; 704.942.7609
SF-1	SPORTS FLOOR	CONNOR SPORTS	DURACUSHION II	-	-	CLEAR MAPLE	-	GYM FLOOR	GREG OLENSKI; GREG.OLENSKI@CONNORSPORTS.COM
SF-2	SPORTS FLOOR	REGUPOL AMERICA	REGUPOL AKTIVPRO ROLL	APR10106	-	MEAN GREEN	-	FITNESS	WIL YOUNGER
STF-1	STAGE FLOOR	HARLEQUIN	STANDFAST	STF501	-	BLACK	-	PLATFORM	-
TZF-1	TERRAZZO, FLOOR	TM TERRAZZO & MARBLE SUPPLY / DAVID ALLEN	EPOXY TERRAZZO	-	-	TM #18-1792	-	FIELD-CORRIDORS, DINING, LOBBY STAIRS	CHERYL SIMERLY; CHERYL@CSIMERLY.COM; 704.577.8717
TZF-2	TERRAZZO, FLOOR	TM TERRAZZO & MARBLE SUPPLY / DAVID ALLEN	EPOXY TERRAZZO	-	-	TM #18-2183	-	GRAY ACCENT - CORRIDORS, DINING	CHERYL SIMERLY; CHERYL@CSIMERLY.COM; 704.577.8717
TZF-3	TERRAZZO, FLOOR	TM TERRAZZO & MARBLE SUPPLY / DAVID ALLEN	EPOXY TERRAZZO	-	-	TM #22-1866	-	GREEN ACCENT - CORRIDORS, DINING	CHERYL SIMERLY; CHERYL@CSIMERLY.COM; 704.577.8717
TZF-4	TERRAZZO, FLOOR	TM TERRAZZO & MARBLE SUPPLY / DAVID ALLEN	EPOXY TERRAZZO	-	-	TM #22-2493	-	YELLOW ACCENT - CORRIDORS, DINING	CHERYL SIMERLY; CHERYL@CSIMERLY.COM; 704.577.8717
DIVISION 9 FINISHES - WALL BASE									
PRB-1	POURED RESIN BASE, CONTINUOUS	STONHARD	STONTEC TRF	-	-	TO MATCH RF-1	6" FLASHED COVE	WITH ALL PRF	DAVID MACHANIC; 336.706.7230

ROOM FINISH LEGEND									
MATERIAL CODE	DESCRIPTION	MANUFACTURER	PRODUCT NAME AND NUMBER	STYLE / PATTERN	FINISH	COLOR	SIZE	COMMENTS	CONTACT
PTB-1	PORCELAIN TILE, BASE	CROSSVILLE	SHADES BY CROSSVILLE	-	-	THUNDER UPS	-	WITH ALL PTF-1	MELISSA HSIN; MHSIN@CROSSVILLESTUDIO.S.COM; 704.968.2829
RBS-1	RUBBER BASE	MANNINGTON	ASH 603	-	-	ASH 603	MANNINGTON EDGE (TYPE TV) 4"	WITH ALL CPT, LVT, CONCRETE	HEATHER FRANKS; HEATHER.FRANKS@MANNINGTON.COM; 704.877.4655
RCB-1	RESILIENT COVE BASE	PROTECTALL	-	-	-	MATTE GRAY (DARK)	6"	WITH ALL RSF, W/ ALUMINUM/SS COVE CAP, CORNER GUARDS, TRANSITION STRIPS, DRAIN RINGS (RAPID WELD) PER MANUFACTURER	ALISON HAIR; AHAIR@PROTECT-ALLFLOORING.COM; 470.281.0121
TZB-1	TERRAZZO, BASE	TM TERRAZZO & MARBLE SUPPLY / DAVID ALLEN	EPOXY TERRAZZO	-	-	TO MATCH TZF-1	6" H STRAIGHT	WITH ALL TZF	CHERYL SIMERLY; CHERYL@CSIMERLY.COM; 704.577.8717
DIVISION 9 FINISHES - WALLS									
CTW-1	CERAMIC TILE, WALL	DALTILE	COLOR WHEEL LINEAR	0190	SEMI GLOSS	ARCTIC WHITE	4" X 12"	FIELD	JONATHAN STUDIOS; JONATHAN.STUDIOS@DALTILE.COM; 704.516.6310
CTW-2	CERAMIC TILE, WALL	DALTILE	COLOR WHEEL LINEAR	X114	SEMI GLOSS	DESERT GRAY	4" X 12"	ACCENT PRIVATE RR, SHOWER	JONATHAN STUDIOS; JONATHAN.STUDIOS@DALTILE.COM; 704.516.6310
CTW-5	CERAMIC TILE, WALL	DALTILE	COLOR WHEEL CLASSIC	0190	SEMI GLOSS	ARCTIC WHITE	4" X 12" BULLNOSE TRIM S-4639	TRIM AT ALL EXPOSED TILE EDGES	JONATHAN STUDIOS; JONATHAN.STUDIOS@DALTILE.COM; 704.516.6310
GTW-1	GROUT, WALL	-	-	-	-	SELECTED BY ARCH WHEN BRAND IS DETERMINED	-	USE WITH CTW-1	-
PNT-1	PAINT	SHERWIN WILLIAMS	SW 7008	-	G3 EGGSHELL FINISH, G1 FLAT	ALABASTER	-	FIELD, CEILINGS	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
PNT-2	PAINT	SHERWIN WILLIAMS	SW 9165	-	G3 EGGSHELL FINISH	GOSSAMER VEIL	-	FIELD	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
PNT-3	PAINT	BENJAMIN MOORE	321	-	G3 EGGSHELL FINISH	VIKING YELLOW	-	ACCENT	-
PNT-5	PAINT	BENJAMIN MOORE	2035-10	-	G3 EGGSHELL FINISH	SEAWEED	-	ACCENT	-
PNT-6	PAINT	SHERWIN WILLIAMS	SW 7019	-	G3 EGGSHELL FINISH	GAUNTLET GRAY	-	ACCENT PERFORMANCE	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
PNT-7	PAINT	SHERWIN WILLIAMS	SW 7650	-	G5 SEMI-GLOSS FINISH	ELLIE GRAY	-	HM DOOR TRIM / ACCENT	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
PNT-9	PAINT	SHERWIN WILLIAMS	SW 6258	-	G1 FLAT MATTE FINISH	TRICORN BLACK	-	-	RUSS HANSEN; RUSSELL.E.HANSEN@SHERWIN.COM; 980.207.9410
WA28	ACOUSTIC WALL ABSORBER	WENGER	GUILFORD OF MAINE	WHISPER	-	1240-1292 BAFFLE	24" X 96" X 3"	BAND	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
WA36	ACOUSTIC WALL ABSORBER	WENGER	GUILFORD OF MAINE	WHISPER	-	1240-1292 BAFFLE	36" X 72" X 3"	BAND, CHORUS	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
WA44	ACOUSTIC WALL ABSORBER	WENGER	GUILFORD OF MAINE	WHISPER	-	1240-1292 BAFFLE	48" X 48" X 3"	CHORUS	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
WD36	ACOUSTIC WALL DIFFUSER	WENGER	GUILFORD OF MAINE	WHISPER	-	1240-1292 BAFFLE	36" 72"	BAND, CHORUS	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
WD44	ACOUSTIC WALL DIFFUSER	WENGER	GUILFORD OF MAINE	WHISPER	-	1240-1292 BAFFLE	48" 48"	BAND, CHORUS	JEFF FROST; JEFF.FROST@WENGERCORP.COM; 770.710.4495
DIVISION 10 SPECIALTIES									
GDC-1	CORNER GUARD	INPRO	-	-	-	STAINLESS	-	ALL EXTERIOR GWB CORNERS; CONFIRM LOCATIONS WITH ARCHITECT	ALEXIS CAPPS; ACAPPS@INPROCORP.COM; 704.456.5568
LKM-1	METAL LOCKERS	PENCO	ALL-WELDED	-	-	HUNTER GREEN	DBL TIER 12"W x 12"D x 60"H	CUSTODIAL, KITCHEN	-
LKM-2	METAL LOCKERS	PENCO	ALL-WELDED	-	-	HUNTER GREEN	DBL TIER 12"W x 12"D x 60"H	PE LOCKER	-
LKM-3	METAL LOCKERS	PENCO	ALL-WELDED	-	-	HUNTER GREEN	DBL TIER 24"W x 24"D x 72"H	TEAM LOCKER ROOM	-
MB-1	MARKER BOARD	CLARIDGE	-	-	-	-	4' X 4'	-	-
MB-2	MARKER BOARD	CLARIDGE	-	-	-	-	4' X 8'	-	-
PC-1	PRIVACY CURTAIN	MAHARAM	BIRCH	-	-	PRIMAVERA	72" W	CLINIC	JULIA WOODSIDE; WOODSIDE@MAHARAM.COM; 704.996.0627
TBD-1	TACKBOARD	FORBO	BULLETIN BOARD	2204	-	-	-	SEE CASEWORK PLANS & ELEV.	-
TPT-1	TOILET PARTITION	SCRANTON	HINY HIDERS	PAISLEY OP	-	TBD	-	-	-
TS-1	TACK STRIP	FORBO	BULLETIN BOARD	2204	-	POPPY SEED	-	SEE CASEWORK PLANS & ELEV.	-
DIVISION 11 EQUIPMENT									
AMP-1	ACOUSTICAL METAL PANELS	GORDON INC - ALPRO	PATTERN 'C'	-	-	PARCHMENT WHITE	-	ACROGUARD POWDER COAT STERLING PDR-30803 ON ALUMINUM	-
AWF-1	ACOUSTIC WRAPPED PANEL FABRIC	MAHARAM	MODE	-	-	040 BONSAI	-	72" WIDE	USE ON AWP
AWF-2	ACOUSTIC WRAPPED PANEL FABRIC	MAHARAM	MODE	-	-	008 SYCAMORE	-	72" WIDE	USE ON AWP
AWP-1A	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-2	-	2' X 4'	LOBBY
AWP-1B	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-1	-	2' X 4'	CHORUS, MEDIA, CAFETERIA
AWP-2A	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-1	-	2'8" X 4'	CAFETERIA
AWP-2B	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-2	-	2' X 4'6"	LOBBY
AWP-3B	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-1	-	2'8" X 5'4"	MEDIA
AWP-4B	ACOUSTICAL WRAPPED PANEL	-	-	-	-	AWF-1	-	1'9" X 5'4"	MEDIA
DIVISION 12 FURNISHINGS									
CR1-1	STAGE CURTAINS	K&M FABRICS	MARVEL	-	-	THUNDER #1200	-	CAFETERIA PLATFORM	-
SHD-1	ROLLER SHADES	DRAPER	TECHMATIC ROLLER SHADE	-	-	WHITE GREY	-	EXTERIOR WINDOWS OF ALL INSTRUCTIONAL SPACES AND OFFICES U.N.O.	-
SSC-1	STAINLESS STEEL COUNTERTOPS	-	-	-	-	-	-	CONCESSIONS	-



**GRIER MIDDLE SCHOOL REPLACEMENT**



227 WEST TRADE STREET SUITE 700  
CHARLOTTE, NORTH CAROLINA 28202  
TEL. 704.333.6666 FAX 704.333.2926  
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REVISIONS:

No.	Description	Date
3	ADDENDUM 1	01-31-23
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
DATE: 01-12-2023

**FINISH LEGEND AND NOTES**

**A-712**

ROOM FINISH SCHEDULE - SECOND FLOOR

ROOM NUMBER	NAME	BASE	FLOORING	WALL FINISH	CEILING FINISH	CASEWORK	REMARKS
130	ELEV	-	-	-	-	-	SEE SUBMITTAL DETAILS
200C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2	ACT-1	-	PNT-1 APPLIED TO GYP SOFFITS
201	TESTING COORD.	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
201C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
202	TESTING	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	PLM-1	
202	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
203	COUNSELOR	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
204	COUNSELOR	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
205	ASST PRIN #1	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
206	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
207	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
208	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	ACT-1	-	
209	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	ACT-1	-	
210	CONF	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
210C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
211	COUNSELOR	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
212	OFFICE STORAGE	RBS-1	CPT-1	PNT-2	ACT-1	PLM-2	
213	PSYCH	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
214	SOC. WORK	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2	ACT-1	-	
215	STORAGE	RBS-1	CPT-1	PNT-2	ACT-1	PLM-2	
216	GUIDANCE	RBS-1	CPT-1, CPT-3; SEE C3/A-713	PNT-2, PNT-8	ACT-1	PLM-4, PLM-6	
217	BOYS	TZB-1	TZF-1, TZF-2, TZF-4	PNT-2 EPOXY	PNT-1	-	
218	GIRLS	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2 EPOXY	PNT-1	-	
219	COLLAB	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-4	ACT-1	-	
220	CUST	RBS-1	CSL-1	PNT-2	EXPOSED	-	
220C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
221	MECHANICAL	RBS-1	CSL-1	PNT-2	EXPOSED	-	
222	GIRLS	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2 EPOXY	PNT-1	-	
223	BOYS	TZB-1	TZF-1, TZF-2, TZF-4	PNT-2 EPOXY	PNT-1	-	
224	TEACHER WORKROOM	RBS-1	RTF-1, RTF-2	PNT-2	ACT-1	PLM-1, PLM-2	
224A	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
224B	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
225	ELEC	RBS-1	CSL-1	PNT-2	EXPOSED	-	
225A	IDF	RBS-1	CSL-1	PNT-2	EXPOSED	-	
225F	COLLAB	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2, PNT-7	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
225G	COLLAB	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2, PNT-7	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
226	CUST	RBS-1	CSL-1	PNT-2	EXPOSED	-	
227	TEACHER WORKROOM	RBS-1	RTF-1, RTF-2	PNT-2	ACT-1	PLM-1, PLM-2	
227A	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
227B	TLT	PTB-1	PTF-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
228	IDF	RBS-1	CSL-1	PNT-2	EXPOSED	-	
229	CUST	RBS-1	CSL-1	PNT-2	EXPOSED	-	
230	BOYS	TZB-1	TZF-1, TZF-2, TZF-4	PNT-2 EPOXY	PNT-1	-	
230C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
231	GIRLS	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2 EPOXY	PNT-1	-	
232	STORAGE	RBS-1	CSL-1	PNT-2	EXPOSED	-	
236	GIRLS	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2 EPOXY	PNT-1	-	
237	BOYS	TZB-1	TZF-1, TZF-2, TZF-4	PNT-2 EPOXY	PNT-1	-	
238	ELEC	RBS-1	CSL-1	PNT-2	EXPOSED	-	
239	COLLAB	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2, PNT-7	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
240	COLLAB	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2, PNT-7	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
240C	CORRIDOR	TZB-1	TZF-1, TZF-2, TZF-3, TZF-4	PNT-2	ACT-1, PNT-1	-	PNT-1 APPLIED TO GYP SOFFITS
241	STEM LAB	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2	ACT-1	-	
241A	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
A201	CLASSROOM 8-1	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A202	CLASSROOM 8-2	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A203	CLASSROOM 8-3	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A204	SCIENCE 8-1	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PER CASEWORK MFG	
A204A	SCIENCE PREP	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
A204B	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
A205	CLASSROOM 8-4	RBS-1	LVT-1, LVT-2, LVT-3	PNT-2, PNT-10	ACT-1	PLM-1, PLM-2	
A206	RESOURCE 8	RBS-1	LVT-1, LVT-2, LVT-3	PNT-2	ACT-1	PLM-1, PLM-2	
A207	CLASSROOM 8-5	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A208	CLASSROOM 8-6	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A209	SCIENCE CLASSROOM 8-2	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PER CASEWORK MFG	
A209A	SCIENCE PREP	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
A209B	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
A210	SCIENCE CLASSROOM 8-3	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PER CASEWORK MFG	
A211	CLASSROOM 8-8	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-10	ACT-1	PLM-1, PLM-2	
A212	CLASSROOM 8-7	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
A213	CLASSROOM 8-9	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-10	ACT-1	PLM-1, PLM-2	
B201	COLLAB	RBS-1	RTF-1, RTF-2, RTF-4	PNT-2, PNT-3	ACT-1	-	
B201A	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
B202	CLASSROOM 7-1	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	PLM-1, PLM-2	
B203	EXPLORING TECH SYSTEMS	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	-	
B203A	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
B204	CLASSROOM 7-2	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	PLM-1, PLM-2	
B205	CLASSROOM 7-3	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	PLM-1, PLM-2	
B206	EXPLORING/ BUSINESS/ MARKETING	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-7	ACT-1	-	
B206A	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	-	
B207	SCIENCE CLASSROOM 7-4	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	PER CASEWORK MFG	
B207A	SCIENCE PREP	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
B207B	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
B208	CPU LAB	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-7	ACT-1	-	
B208A	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PLM-2	
B209	CLASSROOM 7-5	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-5	ACT-1	PLM-1, PLM-2	
B210	RESOURCE 7	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2	ACT-1	PLM-1, PLM-2	
B211	CLASSROOM 7-6	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
B212	CLASSROOM 7-9	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
B213	SCIENCE CLASSROOM 7-7	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PER CASEWORK MFG	
B213A	SCIENCE PREP	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
B213B	STORAGE	RBS-1	RTF-1	PNT-2	ACT-1	PER CASEWORK MFG	
B214	SCIENCE CLASSROOM 7-8	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PER CASEWORK MFG	
B215	CLASSROOM 7-11	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
B216	CLASSROOM 7-10	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
B217	CLASSROOM 7-12	RBS-1	RTF-1, RTF-2, RTF-3	PNT-2, PNT-3	ACT-1	PLM-1, PLM-2	
G007	MECHANICAL PENTHOUSE	RBS-1	CSL-1	PNT-2	EXPOSED	-	
S201	STAIR 01	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2, PNT-4	ACT-1	-	SEE SHEET A-722 FOR ACCENT PNT LOCATION
S202	STAIR 02	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2, PNT-4	ACT-1	-	SEE SHEET A-722 FOR ACCENT PNT LOCATION
S203	STAIR 03	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2, PNT-4	ACT-1	-	SEE SHEET A-722 FOR ACCENT PNT LOCATION
S204	STAIR 04	TZB-1	TZF-1, TZF-2, TZF-3	PNT-2, PNT-4	ACT-1	-	SEE SHEET A-722 FOR ACCENT PNT LOCATION

ROOM FINISH SCHEDULE - BASEMENT

ROOM NUMBER	NAME	BASE	FLOORING	WALL FINISH	CEILING FINISH	CASEWORK	REMARKS
010	GEN. STORAGE	RBS-1	CPL-1	PNT-1	EXPOSED	PLM-2, SSM-1	
011	OFFICE	RBS-1	CPT-1	PNT-1	ACT-1	-	
012	OFFICE	RBS-1	CPT-1	PNT-1	ACT-1	-	
013	CONFERENCE ROOM	RBS-1	CPT-1	PNT-1	ACT-1	-	
014	DATA RACK	RBS-1	CPL-1	PNT-1	EXPOSED	-	
015	TLT	PTB-1	CPL-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
016	TLT	PTB-1	CPL-1	PNT-2 EPOXY; CTW-1, CTW-2	PNT-1	-	
154	SUPPLY	RBS-1	CPL-1	PNT-1	ACT-1	-	

GASTON COUNTY SCHOOLS



GRIER MIDDLE SCHOOL REPLACEMENT



227 WEST TRADE STREET SUITE 700  
CHARLOTTE, NORTH CAROLINA 28202  
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REVISIONS:

No.	Description	Date
5	ADDENDUM 3	02-14-23

PROJECT: 9201-218240  
DATE: 01-12-2023

SECOND FLOOR AND BASEMENT FINISH SCHEDULE

A-714

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SYMBOLS:	
SYMBOL	DESCRIPTION
	NETWORK OUTLET, STANDARD HEIGHT (+18" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
	NETWORK OUTLET, ELEVATED HEIGHT (+42" AFF, UNLESS OTHERWISE NOTED). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
	NETWORK OUTLET, CEILING MOUNTED. ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
	NETWORK WALL PHONE OUTLET, ELEVATED HEIGHT (+42" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE AND PHONE WALL MOUNT FACEPLATE.
	NETWORK OUTLET - RACEWAY ONLY, STANDARD HEIGHT (+18" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
	NETWORK OUTLET - RACEWAY ONLY, ELEVATED HEIGHT (+42" AFF, UNLESS OTHERWISE NOTED). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
	WIRELESS ACCESS POINT CONNECTION (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO WIRELESS ACCESS POINT DETAIL (HARD/OPEN CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. REFER TO WIRELESS ACCESS POINT DETAIL (ACCESSIBLE CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1"-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED. CONTRACTOR INSTALLED COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
	WIRELESS ACCESS POINT CONNECTION (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO WIRELESS ACCESS POINT DETAIL (WALL). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1"-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED. CONTRACTOR INSTALLED, COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
	WIRELESS ACCESS POINT CONNECTION (EXTERIOR). ELECTRICAL CONTRACTOR SHALL PROVIDE 12"x12"x6" DEEP JUNCTION BOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 3'-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED. CONTRACTOR INSTALLED, REFER TO EXTERIOR NETWORK DEVICE DETAIL. COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
	DISPLAY CONNECTION WITH NETWORK AND DUPLEX POWER. ELECTRICAL CONTRACTOR SHALL PROVIDE 3-GANG JUNCTION BOX WITH OFFSET 1-GANG TRIM RING FOR LOW VOLTAGE SECTION, LOW VOLTAGE DIVIDER, 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK CABLING, 0.75" CONDUIT FOR POWER AND DUPLEX RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE. REFER TO DISPLAY DETAIL FOR ADDITIONAL REQUIREMENTS. "AV-WP" - REFER TO AV DISPLAY WITH WALL PLATE DETAIL FOR REQUIREMENTS. "AV-FB" - REFER TO AV DISPLAY WITH FLOOR BOX DETAIL FOR REQUIREMENTS.
	CONDUIT/SLEEVE, 2" UNLESS OTHERWISE NOTED.
	RUNWAY LADDER CABLE TRAY IN TELECOMMUNICATIONS ROOMS.
	WIRE MESH CABLE TRAY ABOVE ACCESSIBLE CEILING; LENGTH AND WIDTH PER PLANS, 4" TALL.
	TWO-POST EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT. PROVIDED BY TELECOMMUNICATIONS CONTRACTOR.
	FOUR-POST EQUIPMENT RACK WITH VERTICAL WIRE MANAGEMENT. PROVIDED BY TELECOMMUNICATIONS CONTRACTOR.
	3/4" FIRE-RATED AC PLYWOOD WITH TWO COATS OF FIRE RETARDANT LIGHT-COLORED PAINT ON ALL SIDES. STAMP SHALL BE VISIBLE MOUNT 8" AFF WITH GRADE A SURFACE EXPOSED.
	PRIMARY BONDING BUSBAR
	SECONDARY BONDING BUSBAR
	DRAWING NOTE

SYMBOLS:	
SYMBOL	DESCRIPTION
	NETWORK CAMERA (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO CAMERA DETAIL (HARD/OPEN CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. WHEN INSTALLED IN ACCESSIBLE CEILING, SECURITY CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. REFER TO CAMERA DETAIL (ACCESSIBLE CEILING). QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
	NETWORK CAMERA (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. REFER TO CAMERA DETAIL (WALL MOUNTED). QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
	NETWORK CAMERA (EXTERIOR CEILING). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1"-0" EQUIPMENT CORD. REFER TO EXTERIOR NETWORK DEVICE DETAIL. QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
	NETWORK CAMERA (EXTERIOR WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 12"x12"x6" DEEP JUNCTION BOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1"-0" EQUIPMENT CORD. REFER TO EXTERIOR NETWORK DEVICE DETAIL. QUANTITY OF SENSORS REQUIRED INDICATED INSIDE CAMERA BY A NUMBER.
	CARD READER. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
	DOOR CONTACT. ELECTRICAL CONTRACTOR SHALL PROVIDE 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
	REQUEST TO EXIT DEVICE/CONNECTION. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
	KEYPAD. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO INTRUSION DETECTION CONTROL PANEL. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
	ELECTRIC STRIKE. ELECTRICAL CONTRACTOR SHALL PROVIDE 1" CONDUIT WITH PULL STRING IN DOOR FRAME TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. HARDWARE CONTRACTOR SHALL PROVIDE DEVICE AND SECURITY CONTRACTOR SHALL PROVIDE CABLING.
	ELECTRIFIED LOCKSET. ELECTRICAL CONTRACTOR SHALL PROVIDE 1" CONDUIT WITH PULL STRING IN DOOR FRAME TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. HARDWARE CONTRACTOR SHALL PROVIDE DEVICE AND SECURITY CONTRACTOR SHALL PROVIDE CABLING.
	PUSH BUTTON DOOR RELEASE. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 3/4" CONDUIT TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
	NETWORK INTERCOM 2-WAY SPEAKER (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BISCUIT BOX. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH ROOM WITH A NETWORK SPEAKER CONNECTION. PROVIDE 10'-0" CABLE SLACK AND COIL AT CABLE TRAY/HOOKS ABOVE ACCESSIBLE CEILING. IP CLASSROOM MODULE SHALL BE LOCATED ABOVE CEILING (PROVIDED AND INSTALLED BY INTERCOM CONTRACTOR). INTERCOM VENDOR/CONTRACTOR SHALL PROVIDE AND INSTALL EQUIPMENT CORDS AND ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.
	70-VOLT INTERCOM SPEAKER (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 3/4" CONDUIT TO NEAREST ACCESSIBLE CEILING. INTERCOM CONTRACTOR PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS. PROVIDE 10' CABLE SLACK AND COIL AT CABLE TRAY/HOOKS ABOVE ACCESSIBLE CEILING. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDE AND INSTALL EQUIPMENT CORDS AND ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.
	70-VOLT INTERCOM SPEAKER (WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX AND 3/4" CONDUIT TO NEAREST ACCESSIBLE CEILING. INTERCOM CONTRACTOR SHALL PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS. PROVIDE 1'-6" CABLE SLACK AND COIL AT CABLE TRAY/HOOKS ABOVE ACCESSIBLE CEILING. *SPEAKERS NOTED AS HIGH OUTPUT SHALL BE RAULAN ACC142 OR APPROVED EQUAL.
	HIGH OUTPUT 70-VOLT EXTERIOR INTERCOM SPEAKER (RAULAN ACC142 OR APPROVED EQUAL). ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL RAULAN RECESSED, WEATHERPROOF BACKBOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDE MINIMUM 18/2 WIRE TO AND BETWEEN SPEAKERS. PROVIDE 10' CABLE SLACK AND COIL AT CABLE TRAY/HOOKS ABOVE ACCESSIBLE CEILING.
	CALL STATION, 2-BUTTON IP CALL BUTTON, CALL & EMERGENCY. ELECTRICAL CONTRACTOR SHALL PROVIDE SINGLE GANG JUNCTION BOX AND 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDED TERMINATED CATEGORY 6A CABLE IN JUNCTION BOX AND 10'FT SLACK ABOVE CEILING AT IP CLASSROOM MODULE LOCATION. INTERCOM VENDOR/CONTRACTOR SHALL PROVIDED ALL NECESSARY ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM.
	70-VOLT INTERCOM SPEAK VOLUME CONTROL. ELECTRICAL CONTRACTOR SHALL PROVIDE SINGLE GANG JUNCTION BOX AND 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. INTERCOM CONTRACTOR SHALL PROVIDED 18/2 WIRE AS REQUIRED.
	NETWORK VIDEO INTERCOM CALL STATION, ELEVATED HEIGHT (+42" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT TO LOCAL ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FROM NETWORK INTERCOM TO LOCAL NETWORK SPEAKER.
	DISPLAY CONNECTION WITH NETWORK, QUAD POWER AND AV. ELECTRICAL CONTRACTOR SHALL PROVIDE RECESSED AV WALL BOX, 2" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK AND AV CABLING, 2" CONDUIT TO ASSOCIATED FLOOR BOX AV CABLING (WHEN FLOOR BOX IS IN SAME ROOM), 0.75" CONDUIT FOR POWER AND DUPLEX RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE, (1) HDMI & (1) PULL STRING TO WALL BOX.
	DATA FOR TEACHING DESK; NETWORK, QUAD POWER AND AV ROUGH-IN. ELECTRICAL CONTRACTOR SHALL PROVIDE RECESSED AV WALL BOX, 2" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK AND AV CABLING, 0.75" CONDUIT FOR POWER AND QUAD RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (2) CATEGORY 6A CABLE.
	MICROPHONE INPUT. SEE GYM SOUND SYSTEM DETAIL FOR ADDITIONAL INFORMATION.
	SPEAKER. SEE GYM SOUND SYSTEM DETAIL FOR ADDITIONAL INFORMATION.

FLOOR BOXES:	
SYMBOL	DESCRIPTION
	4-GANG MULTI-SERVICE FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION EFB45-0G OR APPROVED EQUAL.
	6-GANG MULTI-SERVICE FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION EFB65-0G OR APPROVED EQUAL.
	6" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 6AT OR APPROVED EQUAL.
	8" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 8AT OR APPROVED EQUAL.
	8" MULTI-SERVICE POKE-THRU FLOOR BOX. ELECTRICAL CONTRACTOR SHALL PROVIDE FLOOR BOX, COVER, CONDUITS, ELECTRICAL DEVICES AND ASSOCIATED MOUNTING PLATES FOR A COMPLETE INSTALLATION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. LEGRAND: EVOLUTION 8AT OR APPROVED EQUAL.

GASTON COUNTY SCHOOLS



GRIER MIDDLE SCHOOL REPLACEMENT



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02.14.2023

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REVISIONS:

No.	Description	Date
1	AGENCY REVIEW	11-11-2022
4	ADDENDUM NO 2	02-07-2023
5	ADDENDUM NO 3	02-14-2023

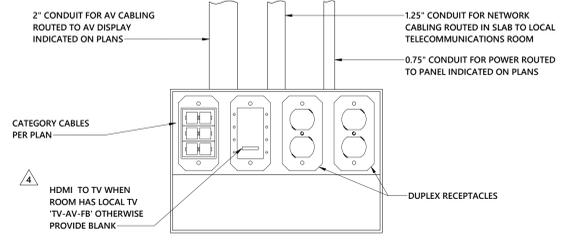
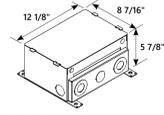
PROJECT: 9201-218240  
DATE: 01-12-2023

TECHNOLOGY SYMBOLS

T-002

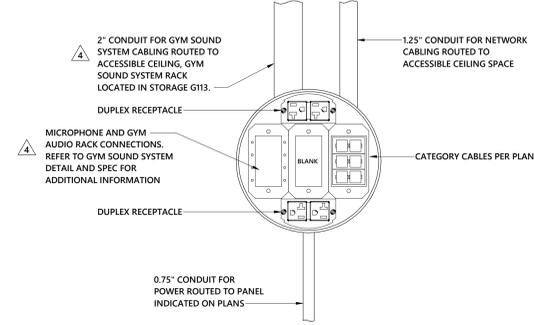
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- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION FLOOR BOX EFB45S-OG OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES.
  - C. PROVIDE ALL INSTALLATION HARDWARE AS REQUIRED.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. FLOOR BOX & COVER, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.
  - G. AV CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY AV CONTRACTOR.
  - H. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.

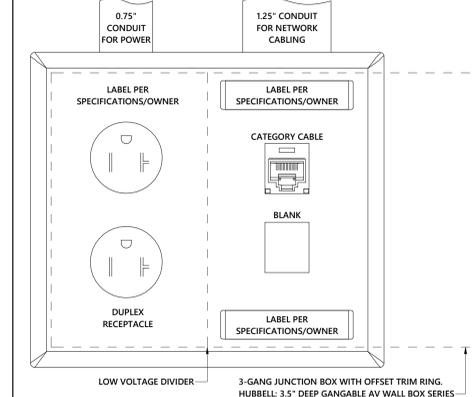


**1 4-GANG MULTI-SERVICE FLOOR BOX**  
NOT TO SCALE

- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION POKE-THRU 8AT OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES. (PRE-WIRED)
  - C. PROVIDE ALL INSTALLATION HARDWARE AS REQUIRED.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. POKE-THRU & COVER, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.
  - G. NO LONGER USED
  - H. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
  - I. ALL CORE DRILLS AND CONDUIT PENETRATIONS SHALL BE COORDINATED, EVALUATED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION.

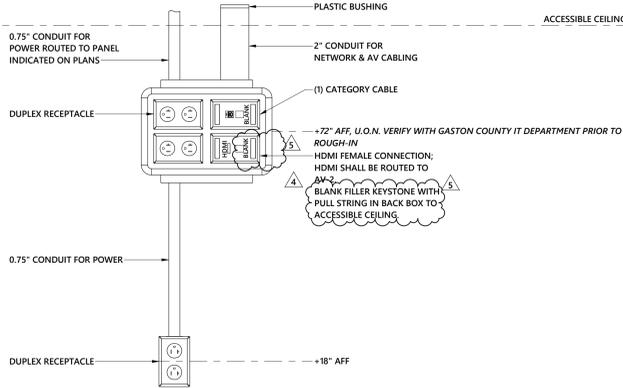
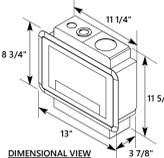


**2 8" MULTI-SERVICE FIRE RATED POKE-THRU FLOOR BOX - TYPE A**  
NOT TO SCALE



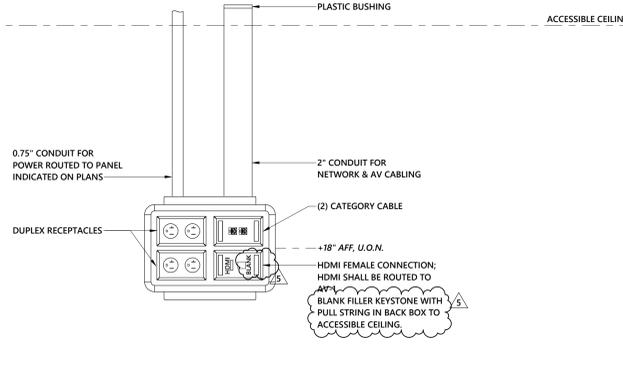
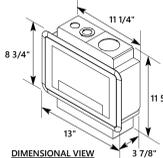
**3 DISPLAY DETAIL WITH NETWORK AND DUPLEX POWER**  
NOT TO SCALE

- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES.
  - C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.



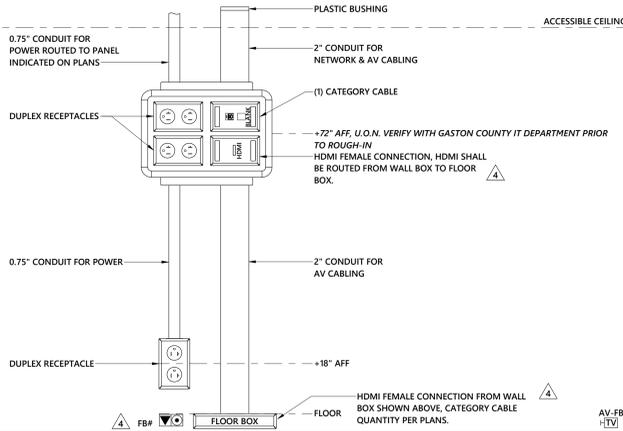
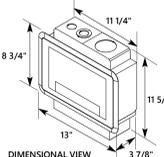
**4 AV-1 DISPLAY DETAIL**  
NOT TO SCALE

- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES.
  - C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.



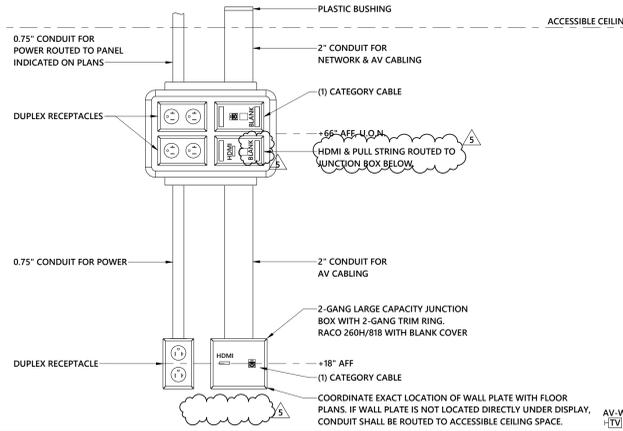
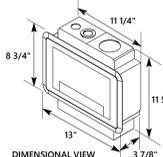
**5 AV-2 DISPLAY DETAIL**  
NOT TO SCALE

- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES.
  - C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.



**6 AV DISPLAY DETAIL WITH FLOOR BOX**  
NOT TO SCALE

- GENERAL NOTES:**
- A. BASIS OF DESIGN: LEGRAND EVOLUTION WALL BOX EFSB4 OR APPROVED EQUAL. PROVIDE HARDWARE AS REQUIRED TO CONNECT DEVICES AND CONDUITS AS INDICATED.
  - B. PROVIDE (2) 5-20R RECEPTACLES.
  - C. PROVIDE INSTALLATION HARDWARE AS REQUIRED. COORDINATE WITH ARCHITECTURAL DRAWINGS.
  - D. ROUTE STRUCTURED CABLING TO TELECOMMUNICATIONS ROOM INDICATED.
  - E. WALL BOX, CONDUIT, RECEPTACLES AND POWER WIRING SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
  - F. STRUCTURED CABLING AND ASSOCIATED HARDWARE SHALL BE PROVIDED BY STRUCTURED CABLING CONTRACTOR.



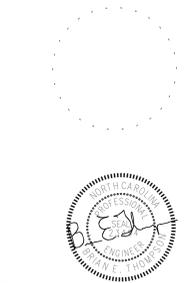
**7 AV DISPLAY DETAIL WITH WALL PLATE**  
NOT TO SCALE



**GRIER MIDDLE SCHOOL REPLACEMENT**



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PROJECT: 9201-218240  
DATE: 01-12-2023

**TECHNOLOGY DETAILS**

**T-502**

Optima # 22-0082

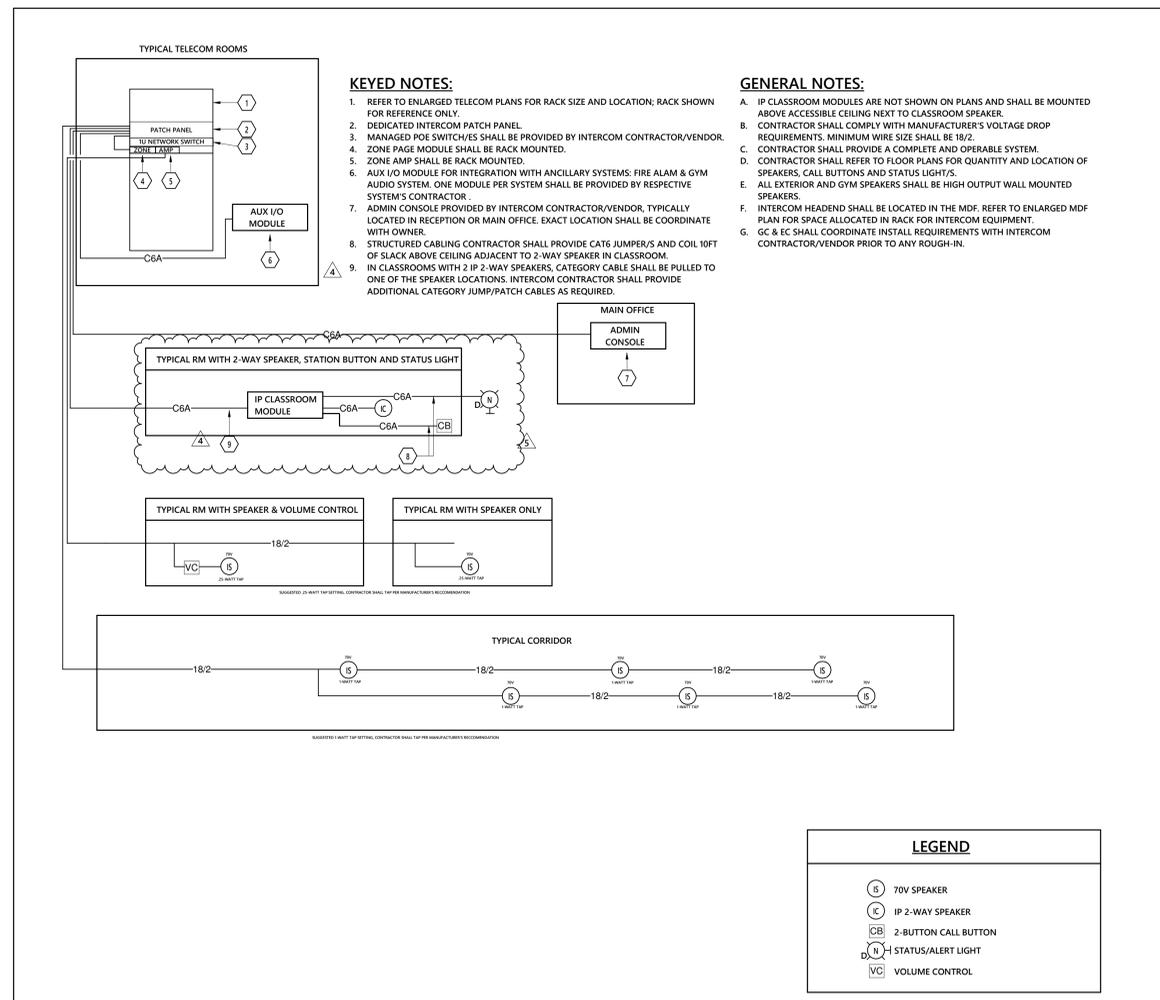
01.12.2023 - BID SET



REVISIONS:

No.	Description	Date
4	ADDENDUM NO 2	02.07.2023
5	ADDENDUM NO 3	02.14.2023

PROJECT: 9201-218240  
DATE: 01-12-2023



1 INTERCOM & PA SYSTEM RISER  
NOT TO SCALE

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