Central Falls High School

100% Construction Documents

Central Falls, RI

Ai3 Project #2202.02

Addendum #6

January 23, 2024

The attention of Bidders submitting proposals for Central Falls High School 100% Construction Documents is called to the following changes to the Bidding Contract Documents dated October 13, 2023 as prepared by Ai3 Architects, LLC. The items set forth therein below, whether of revision, omission, addition, substitution or clarification are all to be included as changes to Information to Bidders, the Conditions of the Contract, Specifications and Drawings of the Contract.

The number of this Addendum (Number 6) must be entered in the appropriate spaces provided on the Bid Form.

CLARIFICATIONS:

ADD 6-001 ***Bidder Question:*** *The Geotech Report prepared by Lahlaf dated August 4, 2023, states that the existing subsurface conditions are not suitable to support shall foundations due to the amount/depths of organic materials. The report goes on to make recommendations for ground improvements under the building foundations, slab on grade, retaining walls and utilities by way of aggregate piers and/or rigid inclusions. The contract documents do not refer to any of this work (with the exception of the Summary of Work - 00 21 13/1.2/A.1), please provide a scope of work and more information on any ground improvements required for this project. Also, the Earthwork spec calls for a removal and replacement of unsuitable materials under the building footprint, paved and landscaping areas. This contradicts what is recommended in the Geotech report.* ***Response:*** *Refer to attached specifications. Any drawing revisions will be addressed in a subsequent Addendum.*

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ADD 6-002 ***Bidder Question:*** *Please clarify where "Intruder Resistant Glass" is required, listed in project specifications but not indicated in drawings.* ***Response:*** *Refer to A6.00C – WINDOW SCHEDULE for all locations with 'SEE NOTE 6' listed under the Glass Type in the schedule.*

ADD 6-003 ***Bidder Question:*** *Please confirm if Spec Section 08 88 60 "Fire Rated Glazing Systems" are required on this project, all fire rated doors and frames are indicated as hollow metal.* ***Response:*** *Specification Section 08 88 60 FIRE RATED GLAZING AND FRAMING SYSTEMS has been removed as it is not part of the project.*

ADD 6-004 ***Bidder Question:*** *Aluminum Storefront Spec 08 43 13 references specification 10 71 13 - EXTERIOR SUN CONTROL DEVICES, this is not part of bid specification set. Please advise.* ***Response:*** *Section 10 71 13 is not part of the project, refer to the specifications below.*

ADD 6-005 ***Bidder Question:*** *Please provide the Basis of Design for the insulated glass on the project. Assuming we are using Solarban 60 (72% VT needs Low Iron glass but the low iron glass will not meet the Solar Heat Gain Coefficient).* ***Response:*** *Insulated glass shall meet or exceed the performance criteria as indicated in the specifications.*

ADD 6-006 ***Bidder Question:*** *Specs (07 13 24) call for a complete wrap of footings, under slab and vertical foundation walls with a pre-applied waterproofing system. None is shown on plans, please confirm whether or not this is required.* ***Response:*** *Pre-applied sheet waterproofing to be applied at elevator pits only. Refer to specifications below.*

ADD 6-007 ***Bidder Question:*** *The alternates listed in SPEC Section 01 23 00 (specifically alternates #1, #7, and #9) and alternates shown on Electrical Drawings: ES0.1 Key Note 1 Alt #5; ES.01 Key Note 2 Alt #3; ES.01-ES.02 Alt #6; ES.04 Alt #6; E1.11A-A7 - A1.14B-A7 Alt #7; Es.01-ES.02 Alt #9 do not align in labeling or scope. Please confirm alternate scopes.* ***Response:*** *ES0.1 Key Note 1 Alt #5 - correct and is related to the Freight Farm in the specifications and drawings ; ES.01 Key Note 2 Alt #3 - correct and is related to the Outdoor Classroom in the specifications and drawings; ES.01-ES.02 Alt #6 – Refer to Addendum #3; ES.04 Alt #6 – the identified drawing contains no work as it relates to Alternate #6; E1.11A-A7 - A1.14B-A7 Alt #7 – base bid is for the recessed lighting and Alternate #7 is for the linear pendant fixtures. For both the circuiting and controls are to be included as indicated*

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on the bid documents; Es.01-ES.02 Alt #9 – Refer to Addendum #3.

ADD 6-008 ***Bidder Question:*** *Please clarify if back pans that are shown in the documents and in the specifications are required to be drainable. There is no indication of that in any documents.* ***Response:*** *Back pans are not required to be drainable.*

ADD 6-009 ***Bidder Question:*** *Please identify where the window film is required on the project.* ***Response:*** *Section 08 87 00 – GLAZING SURFACE FILMS is not part of the project, refer to the specifications below.*

ADD 6-010 ***Bidder Question:*** *Metal locker spec 10 51 13-2.2 notes type 3 lockers as both 4 tier and 5 tier, please clarify.* ***Response:*** *Lockers shall be 4-tier. Refer to attached specifications.*

ADD 6-011 ***Bidder Question:*** *Spec 10 12 00 was issued for display cases. Drawing A9.11 for display cases details notes display cases to be provided by division 06. Please clarify scope for display cases per spec 10 12 00.* ***Response:*** *Specification Section 10 12 00 – DISPLAY CASES, are for display cases noted on the drawings as 'PREFABRICATED DISPLAY CASE'.*

ADD 6-012 ***Bidder Question:*** *Spec 10 51 23-2.1 does not identify basis of design manufactuer/product for phenolic lockers, and also notes no substitutions. Other acceptable manufacturers are also listed, please clarify BOD material and if other manufacturers are acceptable.* ***Response:*** *Section 10 51 23 – PHENOLIC LOCKERS is not part of the project, refer to the specifications below.*

ADD 6-013 ***Bidder Question:*** *Please clarify wood plank flooring scope (09 64 29). Shown on detail 6/A10.71 but not shown on finish floor plans A7.01.* ***Response:*** *There is NO wood strip and plank flooring in the scope of this project. Refer to attached drawings and specifications.*

ADD 6-014 ***Bidder Question:*** *Specified hardware sets 3.0 & 16.0 are for pairs of doors, however, thet are shown to be included with (8) single doors. Specified to also include fire rated hardware and for concealed vertical rod panics. Specified doors are not fire rated, they are ballistic and vertical rods are for door pairs not single leaves. PLease clarify requirements* ***Response:*** *Doors 122A-01, 122A-02 are paired openings, and should remain hardware set 3.0. Should hardware that is specified be required to be modified to accommodate the ballistic door manufacturer being submitted, we will review the changes at the time of*

submission. The hardware specified for these doors is correct with two rim Exit Devices, there are no concealed rods specified or listed in the hardware set for Section 087100. The [12] is a designation for fire rating, however, this should only be provided at fire rated openings. The brackets are indicating to provide only when rated. Doors 122A-03 and A122-04 are assigned correctly to set 16.0, which is for a paired opening. There are no vertical rods specified at these doors. Doors C102A-01, C102A-02, C102A-03, and C102A-04 are paired openings, and should remain hardware set 3.0. Should hardware that is specified be required to be modified to accommodate the ballistic door manufacturer being submitted, we will review the changes at the time of submission. The hardware specified for these doors is correct with two rim Exit Devices, there are no concealed rods specified or listed in the hardware set for Section 087100. The [12] is a designation for fire rating, however, this should only be provided at fire rated openings. The brackets are indicating to provide only when rated.

ADD 6-015 ***Bidder Question:*** *On slab edge detail S0.21; per schedule a bent plate is required only "B" is over more than 11" overhang. Referring to 4/A5.16, there is a bent pllate shown and the over hang is less than 11". Please clarify what is required.* ***Response:*** *Bent plate pour stops shall follow criteria on structural drawings.*

ADD 6-016 ***Bidder Question:*** *There is a discrepency between detail base plate anchorage and shear lug detail on S2.20. It is written: provide anchor sleeve at base plate with shear lugs and shear struts but nothing is shown on shear lug detail. Please clarify.* ***Response:*** *Sleeves are required where shear lugs are required, refer to attached drawings.*

ADD 6-017 ***Bidder Question:*** *Regarding base plate anchorage detail S2.20, please clarify what "Shear Struts" is referring to.* ***Response****: For shear structs refer to S4.10 "Typical Bracing Connection Details – Connection at Column Base w/ Strut Beam" The shear strut reference refers to the back-to-back channels at the base of the brace towers (where applicable). Refer to attached drawings.*

ADD 6-018 ***Bidder Question:*** *The casework spec section 12 30 00 2.8G notes leveling devices at open framed tables. In science and classrooms, are teacher and student tables part of the FFE package, and owner supplied?* ***Response:*** *Teacher and student tables in the classrooms and science rooms are part of FF&E.*

ADD 6-019 ***Bidder Question:*** *Please identify a color for countertops that are PLAM, per spec section 12 30 00.* ***Response:*** *PLAM color to be selected by Architect as part of the submittal process.*

ADD 6-020 ***Bidder Question:*** *The enlarged plans for the science rooms show Electrical pedestals on countertops, Detail 6/A7.13 show an outlet mounted in the base cabinet back panel. Are there to be both an outlet mounted in the base cabinet and the countertop pedestal outlet at epoxy tops that are not 30" deep also? See elevation 5/A9.33 room 209.* ***Response:*** *There are no pedestals within the cabinet. Pedestals should only be on top of the counter. Power and Data however is required within the back of the cabinet as currently shown. Cabling into base of and out the back of the top pedestal is low voltage cabling.*

ADD 6-021 ***Bidder Question:*** *Bid form requires a cost breakdown of (72) items to be submitted with the bid. Can the cost breakdown be submitted with-in 24 hours after the bid to allow proper time to verify scope and pricing with the vendor's and subcontractors?* ***Response:*** *The cost breakdown is required at the time of bid submission in order to constitute a complete bid.*

ADD 6-022 ***Bidder Question:*** *Spec Section 00 45 39 DBE Special Provision Affidavit references RIDOT rules, regulations and approved disadvantaged subcontractors and vendors along with the State Department of Transportation's approval of the affirmative actions taken. This is unusual for a building project which is normally approved by the RI Department of Administration, Division of Equity, Diversity & Inclusion, Equal Opportunity Office. Please confirm we are to disregard the Special Provisions Affidavit and it does not need to be submitted with the bid. Normally, we submit our minority participation compliance forms to the owner and the state of Rhode Island Division of Equity, Diversity, and Inclusion office 5 days after the bid. This allows for proper scope review of subcontractor and vendor pricing and qualifications.* ***Response:*** *To be answered in subsequent Addendum.*

ADD 6-023 ***Bidder Question:*** *Specifications call for a 2 year General Contractors comprehensive warranty but various specification sections only call for a 1 year warranty. Should all subcontractors, manufacturers and vendors be held to a 2 year warranty period accordingly?* ***Response:*** *To be answered in subsequent Addendum.*

ADD 6-024 ***Bidder Question:*** *Specification Section 01 35 43 Environmental Procedures and section 02 28 20 Asbestos Remediation*

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reference hazardous materials but the only quantity given is 1,500 linear feet of transite pipe along with the Roofing, Coolers and Freezers. Appendix D Hazardous Materials Visual Inspection Report detects no hazardous materials from the actual testing. Universal's letter dated April 20, 2023 references an estimated cost of $65 000 to remove suspected asbestos materials. Please clarify the extent of hazardous materials we are to carry in our bid or simply establish an allowance the bidders can carry. ***Response:*** *Extent of hazardous materials to be determined. Bidders shall carry an allowance of $65,000 to remove expected asbestos materials at International Meat Market building.*

ADD 6-025 ***Bidder Question:*** *At the site walk we observed there to be an existing playground, NW of the existing track. Please confirm the General Contractor is to R&D this playground and equipment as part of their work.* ***Response:*** *To be answered in subsequent Addendum.*

ADD 6-026 ***Bidder Question:*** *Please confirm the required compressive strengths of both underslab and foundation wall insulation. Underslab is called out as high compression but there is no required PSI listed. Please provide more information.* ***Response:*** *Refer to attached specifications.*

ADD 6-027 ***Bidder Question:*** *Architectural details on the A5.XX series indicate that the vapor barrier and insulation are to be carried down the foundation wall. There is no "bottom of wall/footing" detail found on the Architectural drawings which shows the extent of this vapor barrier and the foundation wall insulation, is it to be carried to a specific depth or to top of footing? Please provide more information.* ***Response:*** *Vapor barrier and insulation to be carried to the top of footing.*

ADD 6-028 ***Bidder Question:*** *Spec Section 08 43 15, Bullet Resistant Alum Storefront Framing, para 2.3A & B reference the bullet resistant glazing and refers you to the glazing spec under glass type 7. The glazing spec 08 80 00 does not have a glass type 7 listed. There is reference to a glass type F which refers you to spec sect 08 43 15. Please provide a spec on the bullet resistant glazing.* ***Response:*** *Glass Type 7 shall be glass type as described in Specification Section 08 80 00, 2.4, G, for the Intruder Resistant Glass.*

ADD 6-029 ***Bidder Question:*** *Please provide specification on the CTA – Adult Changing Table and PT - Surface Mounted Paper Towel Dispensers.* ***Response:*** *Refer to attached specifications for the*

CTA-Adult Changing Table and PT-Surface Mounted Paper Towel Dispensers.

ADD 6-030 ***Bidder Question:*** *12 30 00 Section 2.4 A Casework Construction, calls for Radius lip Semi Overlay construction. Section 2.2A calls for full flush overlay without a lipped construction (aligning with drawing details) Please confirm full flush construction is to be used.* ***Response:*** *Confirmed, full flush construction to be used.*

ADD 6-031 ***Bidder Question:*** *1. Spec 12 30 00 Section 2.8B Hardware-Please provide Manufacture and Model # for Approved pull equal. 2. Spec 12 30 00 Section 2.8B Hardware: Please provide Model number for Linnea 6/12" pulls. 3. Spec 12 30 00 Section 2.7B Epoxy Countertops: Please confirm that straight edge is to be used for epoxy countertops not marine edge.* ***Response:*** *1. Or equals should meet the criteria of the specifications., 2. Model #144, 3. Confirmed, Straight Edge to be used.*

ADD 6-032 ***Bidder Question:*** *Please refer to drawing L3.03, detail 3, which shows concrete bleachers on top of the cast in place seat walls. There does not appear to be any further information on these concrete bleachers, please provide a specification and detail as to how they are mounted on the seat walls.* ***Response:*** *The concrete bleachers, as detailed on L3.03, are intended to be poured separately from the stair cheek walls (Parapet Stair Cheek Wall 2/L3.03). The concrete bleachers are pinned to one another and pinned to the concrete walk at the top of the stairs. There is an expansion or isolation joint shown between the cheek wall and the bleacher seats. A subsequent Addendum will include required details to show the relationship between the bottom of the concrete bleacher seat footing and top of the cheek wall footing.*

ADD 6-033 ***Bidder Question:*** *Please provide more information on the concrete vaults shown on C5.1 for the relocation of the twin 48" RCP pipe, not limited to, vault details, vault inverts, reinforcement requirements, etc.. Also, only TC-1 calls for it to be cast-in-place, is the intent for all 3 vaults to be cast-in-place.* ***Response:*** *Transition chamber details have been added to sheet C6.5, including dimensions, elevations, and reinforcement requirements. All three transition chambers shall be cast-in-place. Transition chamber callouts on Sheet 5.1 have been revised accordingly.*

ADD 6-034 ***Bidder Question:*** *Please refer to C5.1, where TC-1 "connects" to the existing concrete culvert, please provide more detail on this*

connection and the existing concrete vault. ***Response:*** *The callout on sheet C5.1 has been revised to indicate connection to the existing twin 48" pipes.*

ADD 6-035 ***Bidder Question:*** *Please refer to C5.1, Note 9, which calls for the concrete vault detention system to be anchored into a concrete slab. There do not appear to be any concrete vault detention systems on the project. Please confirm this is not required.* ***Response:*** *The concrete vault detention system is not included in the project. Sheet C5.1 has been revised to remove this note.*

SPECIFICATIONS:

ADD 6-036 *Document 00 01 10 "Table of Contents"; REMOVE in entirety and REPLACE with new Document 00 01 10, dated January 23, 2024, Addendum #6.*

ADD 6-037 *ADD new Document 00 43 22 "Bid Attachment – Unit Prices Form" dated January 23, 2024, Addendum #6; bound herewith and is part of this Addendum, .*

ADD 6-038 *Document 00 43 93 "Bid Submittal Checklist"; REMOVE in entirety and REPLACE with new Document 00 43 93, dated January 23, 2024, Addendum #6.*

ADD 6-039 *ADD new Section 01 22 00 "Unit Prices" dated January 23, 2024, Addendum #6; bound herewith and is part of this Addendum, .*

ADD 6-040 *Section 07 13 24 "Pre-Applied Sheet Waterproofing", Article 1.1, Paragraph A.1; REVISE to read as follows:*

1. Pre-applied sheet waterproofing at hydrostic conditions at ~~underside of slabs, footings,~~ elevator pits ~~and exterior face of walls~~. [ADD #6]

ADD 6-041 *Section 07 21 00 – "Thermal Insulation"; REMOVE in entirety and REPLACE with new Section 07 21 00, dated January 23, 2024, Addendum #6.*

ADD 6-042 *Section 08 43 13 "Aluminum-Framed Storefronts"; Article 1.1, Paragraph B, DELETE subparagraph 3 in entirety, as follows*

3. ~~Exterior sun control devices furnished under Section 10 71 13 – Exterior Sun Control Devices.~~ [ADD #6]

ADD 6-043 *Section 08 80 00 "Glazing", Article 2.3, Paragraph B; ADD the following subparagraphs 4 and 5:*

4. Glass Type D: Insulated Spandrel Glass, locate where indicated.
5. Glass Type F: Bullet Resistant Glass, locate where indicated.

ADD 6-044 *Section 08 80 00 "Glazing", Article 2.3, Paragraph F.1.a; DELETE the words "heat strengthened" and REPLACE with "fully-tempered safety"*

ADD 6-045 *Section 08 80 00 "Glazing", Article 2.3, Paragraph F.1.c; DELETE the words "heat strengthened" and REPLACE with "fully-tempered safety"*

ADD 6-046 *REMOVE Section 08 87 00 "Glazing Surface Films" in entirety, and all references thereto; scope of Section is not in Project.*

ADD 6-047 *REMOVE Section 08 88 60 "Fire-Rated Glazing and Framing Systems" in entirety; scope of section not in Project.*

ADD 6-048 *REMOVE Section 09 64 29 "Wood Strip and Plank Flooring" in entirety, and all references thereto; scope of Section is not in Project.*

Bidders Note that Drawing Keynotes for 096429.01 are incorrect on Drawing A10.71, and are revised 062000.49 as part of this Addendum.

ADD 6-049 *Section 10 12 00 "Display Cases", Article 2.1, Paragraph A; ADD the words ", model 900DC." at end of Paragraph.*

ADD 6-050 *Section 10 12 00 "Display Cases", Article 2.2 Paragraph A; REVISE Paragraph to read as follows (note, no changes to subparagraphs 1 through 6).*

A. ~~Art~~ **Display** Cases: ~~Semi-Recessed~~ **Surface-mounted, wall mounted** ~~display case~~ all glass **display** case with aluminum header and base, and light. **Provide with pivot hinged frameless glass doors. [ADD #6]**

ADD 6-051 *Section 10 28 13 "Toilet Accessories"; REMOVE in entirety and REPLACE with new Section 10 28 13, dated January 23, 2024, Addendum #6.*

ADD 6-052 *Section 10 51 13 "Metal Lockers"; Article 2.2, Paragraph F (locker type 3), DELETE the words "5 tier" and REPLACE with the words "4 tier".*

ADD 6-053 *Section 10 51 13 "Metal Lockers"; Article 2.2, Paragraph F (locker type 3), DELETE the words "29 inches" and REPLACE with the words "15 inches".*

ADD 6-054 *REMOVE Section 10 51 23 "Phenolic Lockers" in entirety, and all references thereto; scope of Section is not in Project.*

ADD 6-055 *Section 12 30 00 "Casework", Article 2.8; DELETE Paragraph B and REPLACE with the following:*

B. Pulls: [ADD #6]
   1. Typical: Linnea, Suwanee, GA., Model 144-C-SSS, Stainless Steel square bar pull, satin finish stainless steel, 310 mm length (nominal 12.2 inches).
   2, Where indicated (and as marked on approved shop drawings): Linnea, Suwanee, GA., Model 144-E-SSS, Stainless Steel square bar pull, satin finish stainless steel, 170 mm length (nominal 6.7 inches).

ADD 6-056 *Section 31 00 00 "Earthwork"; REMOVE in entirety and REPLACE with new Section 31 00 00, dated January 23, 2024, Addendum #6.*

ADD 6-057 *ADD new Section 31 60 00 "Ground Improvements" dated January 23, 2024, Addendum #6; bound herewith and is part of this Addendum, .*

DRAWINGS:

ADD 6-058 *C5.1 – DRAINAGE PLAN*

ADD 6-059	*C6.5 - SITE DETAILS*
ADD 6-060	*A10.71 – AUDITORIUM STAIR & GUARDRAIL DETAILS*
ADD 6-061	*S2.20 – BASE PLATE AND PIER DETAIL – 1*
ADD 6-062	*FP1.11C – FIRE PROTECTION FIRST FLOOR PLAN – ZONE C*
ADD 6-063	*FP1.12B – FIRE PROTECTION SECOND FLOOR PLAN – ZONE B*
ADD 6-064	*FP1.12C – FIRE PROTECTION SECOND FLOOR PLAN – ZONE C*
ADD 6-065	*FP1.13C – FIRE PROTECTION THIRD FLOOR PLAN – ZONE C*
ADD 6-066	*M5.01 – MECHANICAL SCHEDULES*
ADD 6-067	*M5.02 – MECHANICAL SCHEDULES*
ADD 6-068	*E0.01 – ELECTRICAL LEGEND*
ADD 6-069	*E1.11B – ELECTRICAL FIRST FLOOR LIGHTING PLAN – ZONE B*
ADD 6-070	*E1.11C – ELECTRICAL FIRST FLOOR LIGHTING PLAN – ZONE C*
ADD 6-071	*E1.12B – ELECTRICAL SECOND FLOOR LIGHTING PLAN – ZONE B*
ADD 6-072	*E1.12C – ELECTRICAL SECOND FLOOR LIGHTING PLAN – ZONE C*
ADD 6-073	*E1.13B – ELECTRICAL THIRD FLOOR LIGHTING PLAN – ZONE B*
ADD 6-074	*E1.13C – ELECTRICAL THIRD FLOOR LIGHTING PLAN – ZONE C*
ADD 6-075	*E1.14B – ELECTRICAL FOURTH FLOOR LIGHTING PLAN – ZONE B*
ADD 6-076	*E2.11A – ELECTRICAL FIRST FLOOR POWER PLAN – ZONE A*
ADD 6-077	*E2.11B – ELECTRICAL FIRST FLOOR POWER PLAN – ZONE B*
ADD 6-078	*E2.11C – ELECTRICAL FIRST FLOOR POWER PLAN – ZONE C*

ATTACHMENTS:

ADD 6-079	*SECTION 00 01 10 – TABLE OF CONTENTS*
ADD 6-080	*SECTION 00 43 22 – BID ATTACHMENT – UNIT PRICES FORM*
ADD 6-081	*SECTION 00 43 93 – BID SUBMITTAL CHECKLIST*
ADD 6-082	*SECTION 01 22 00 – UNIT PRICES*
ADD 6-083	*SECTION 07 21 00 – THERMAL INSULATION*
ADD 6-084	*SECTION 10 28 13 – TOILET ACCESSORIES*
ADD 6-085	*SECTION 31 00 00 – EARTHWORK*
ADD 6-086	*SECTION 31 60 00 – GROUND IMPROVEMENTS*

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NOTE:

1. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED FOR THE DURATION OF CONSTRUCTION. AT A MINIMUM, PERIMETER HAY BALES, VEHICLE TRACKING CONTROL, INLET PROTECTION, AND TEMPORARY SEDIMENTATION BASINS SHOULD BE CONSIDERED.
2. ALL UTILITIES WITHIN THE FOOTPRINT OF PROPOSED BUILDING ADDITIONS SHOULD BE ANTICIPATED TO BE REMOVED AND RELOCATED. SERVICE SHALL BE MAINTAINED TO EXISTING BUILDINGS TO REMAIN FOR THE DURATION OF CONSTRUCTION.
3. ALL EXISTING STRUCTURES TO REMAIN WITHIN THE LIMITS OF WORK SHALL BE ADJUSTED TO FINISH GRADE. SERVICE SHALL BE MAINTAINED TO EXISTING BUILDINGS TO REMAIN FOR THE DURATION OF CONSTRUCTION.
4. ALL PRECAST CONCRETE MANHOLES FOR DRAINAGE SHALL CONFORM TO THE ASTM "SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS," DESIGNATION D478. THE BARREL SHALL BE 4-FOOT WITH A 1-FOOT COLLAR TO PREVENT FLOTATION.
5. ALL DRAIN LINES SHALL BE 12" UNLESS OTHERWISE NOTED. ALL DRAIN LINES SHALL BE HDPE UNLESS OTHERWISE NOTED.
6. ALL CATCH BASINS TO BE 4' DIAMETER (UNLESS OTHERWISE NOTED) SHALL CONFORM TO MHD STANDARD DETAIL 201.4.0 AND ALL CATCH BASIN FRAMES AND GRATES SHALL CONFORM TO 201.6.0 UNLESS OTHERWISE NOTED.
7. ALL MANHOLES TO BE 4' DIAMETER (UNLESS OTHERWISE NOTED) AND SHALL CONFORM TO MHD STANDARD DETAIL 202.4.0 AND ALL MANHOLE FRAMES AND COVERS SHALL CONFORM TO 202.6.0 UNLESS OTHERWISE NOTED. CONCRETE ANTI-FLOTATION COLLARS SHALL BE PROVIDED AT ALL MANHOLES.
8. REINFORCED CONCRETE PIPE AND FLARED ENDS SHALL CONFORM TO THE AASHTO M170 FOR STANDARD STRENGTH REINFORCED CONCRETE CULVERT PIPE FOR CLASS III PIPE, WALL B. OR ASTM C76 FOR REINFORCED CONCRETE CULVERT AND STORM DRAIN PIPE UNLESS NOTED OTHERWISE. ALL PIPE 24 INCHES IN DIAMETER OR SMALLER SHALL BE OF THE BELL AND SPIGOT TYPE. PIPES LARGER THAN 24 INCHES IN DIAMETER SHALL BE TONGUE AND GROOVE OR BELL AND SPIGOT. ALL DRAINAGE PIPING SHALL BE GASKETED.
9. ~~CONCRETE VAULT DETENTION SYSTEMS SHALL INCLUDE AN 8" EXTENDED CONCRETE SLAB WITH UNITS ANCHORED INTO SLAB, AND SHALL BE LINED WITH AN IMPERVIOUS LINER.~~ ADD-6
10. HIGH-DENSITY POLYETHYLENE PIPE AND FITTINGS SHALL BE ADS N-12 IB ST SMOOTH INTERIOR PIPE, ADS N-12 IB ST HIGH CAPACITY LARGE DIAMETER PIPE OR APPROVED EQUIVALENT. JOINTS SHALL BE SOIL-TIGHT AND INCLUDE A RUBBER GASKET ON THE SPIGOT END OF THE PIPE. WHEN INSTALLED INTO THE BELL END, THE JOINT SHALL BE SEALED.
11. MANHOLES OVER 12 FEET IN DEPTH SHALL HAVE MINIMUM OF 5 FEET INSIDE DIAMETER. ALL MANHOLES SHALL HAVE A SUMP OF AT LEAST 30 INCHES BELOW INVERT OF OUTLET PIPE. RISERS SHALL BE CLAY OR SHALE BRICK, AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 91, GRADE MM OR AS SPECIFIED IN MASSDOT M4.05.
12. ALL CATCH BASINS SHALL HAVE A SUMP OF AT LEAST 48 INCHES (4 FEET) BELOW THE INVERT OF THE OUTLET PIPE, OR OTHERWISE APPROVED BY THE TOWN, AND AN INSIDE DIAMETER OF 4 FEET MINIMUM.
13. LIVE LOAD DESIGN FOR CATCH BASINS SHALL BE HS-25 LOADING. CATCH BASINS WHICH ARE LIMITED BY HEIGHT SHALL BE INSTALLED WITH A FLAT TOP SLAB, CAST IN PLACE, DESIGNED FOR HS-25 LOADING AND CAST IRON FRAME CAST IN PLACE.
14. MANHOLE FRAMES AND COVERS SHALL BE AT LEAST CLASS 25 CONFORMING TO ASTM A48 "STANDARD SPECIFICATION FOR GRAY IRON CASTINGS".
15. CATCH BASIN HOODS SHALL BE USED TO MINIMIZE THE ENTRY OF OIL, GASOLINE, AND DEBRIS INTO DRAINAGE PIPES.
16. WHERE PROPOSED DRAIN LINES CROSS SANITARY OR WATER LINES WITH LESS THAN 1.5' CLEARANCE, ENCASE BOTH UTILITIES IN FLOWABLE FILL FOR A DISTANCE OF 10' ON EITHER SIDE OF CROSSING. CENTER PIPE LENGTH AT CROSSING. REFER TO CROSSING DETAIL ON SHEET C5.2 ON DETAIL SHEETS.

BID ALTERNATE NOTES:

ALTERNATE 2 - OUTDOOR FURNITURE: DRAINAGE WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE. REFER TO LANDSCAPE DRAWINGS FOR INFORMATION REGARDING THE BASE BID AND ALTERNATE.

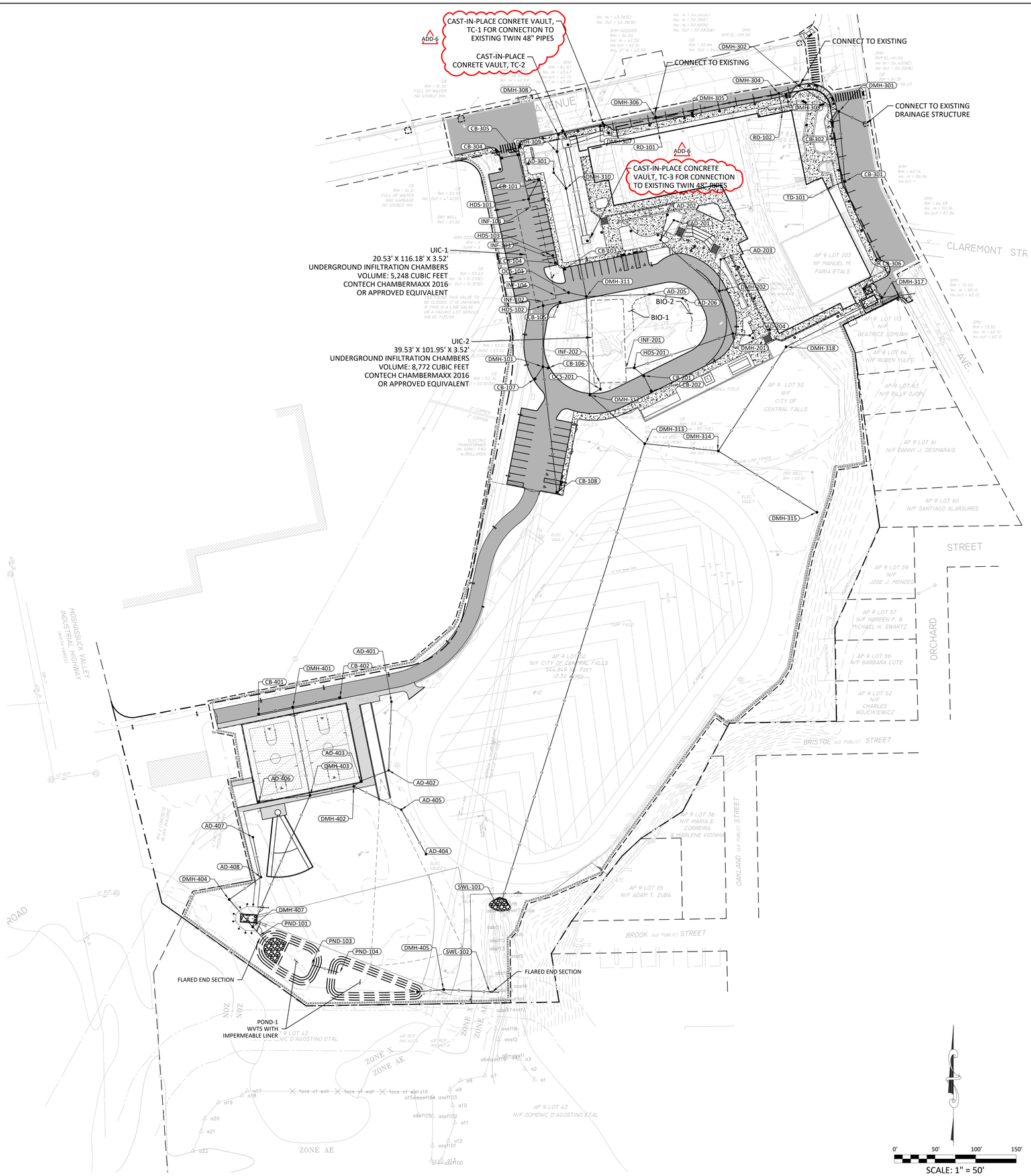
ALTERNATE 3 - OUTDOOR CLASSROOM: OUTDOOR CLASSROOM FEATURES ASSOCIATED WITH THE ALTERNATE ARE SHOWN AS BACKGROUND INFORMATION ON THIS SHEET. DRAINAGE WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE.

ALTERNATE 5 - FREIGHT FARM UNIT: DRAINAGE WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE. REFER TO ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR INFORMATION REGARDING THE BASE BID AND ALTERNATE.

ALTERNATE 6 - THROWING EVENTS: DEMOLITION WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE.

ALTERNATE 9 - SPORTS LIGHTING: ALL WORK SHOWN ON THE CIVIL DRAWING SHEETS ARE ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE. REFER TO THE ELECTRICAL DRAWINGS FOR INFORMATION REGARDING SITE ELECTRIC.

ALTERNATE 10 - TREES: DRAINAGE WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE. REFER TO LANDSCAPE DRAWINGS FOR INFORMATION REGARDING THE BASE BID AND ALTERNATE.



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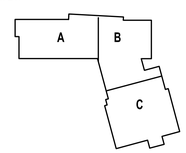
KEYNOTE LEGEND:

ADD-6 ADDENDUM #6 01.23.2024

100% CONSTRUCTION DOCUMENTS

NORTH ARROW

KEYPLAN

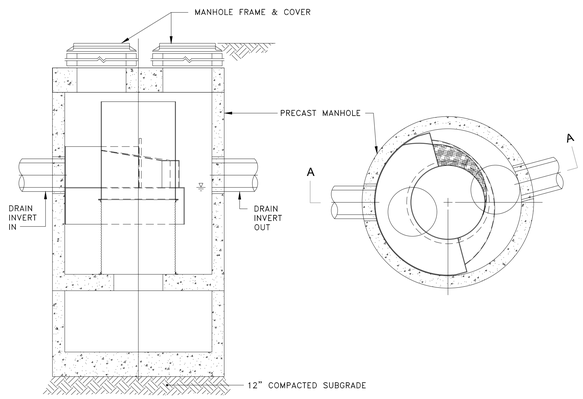


DRAWING NAME:

DRAINAGE PLAN

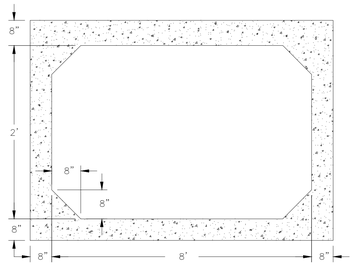
DRAWN BY:	SMC
REVIEWED BY:	GBD
SCALE:	AS NOTED
JOB NO.:	77997
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: C5.1



GENERAL NOTES
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS ARE SCHEMATIC DIMENSIONS. ACTUAL DIMENSIONS MAY VARY DEPENDING ON MANUFACTURER, DESIGN, AND STRUCTURE.
3. CONTRACTOR TO PROVIDE SHOP DRAWING AND CALCULATIONS FROM MANUFACTURER OF EACH HS
4. WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL CODES, LAWS, AND REGULATIONS OF MASSDEP, CITY OF WATERTOWN, AND ALL OTHER GOVERNING AGENCIES.
5. STRUCTURE AND CASTINGS SHALL MEET AASHTO HS20 LOAD RATING.
6. SEE TABLE FOR SIZING AND BASIS OF DESIGN DATA.

HDS-X HYDRODYNAMIC SEPARATOR DETAIL
NOT TO SCALE



REINFORCED CONCRETE BOX CULVERT DETAIL
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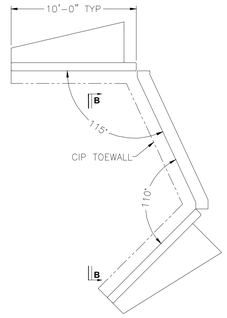
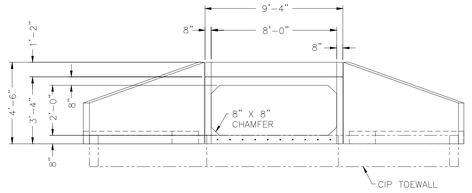
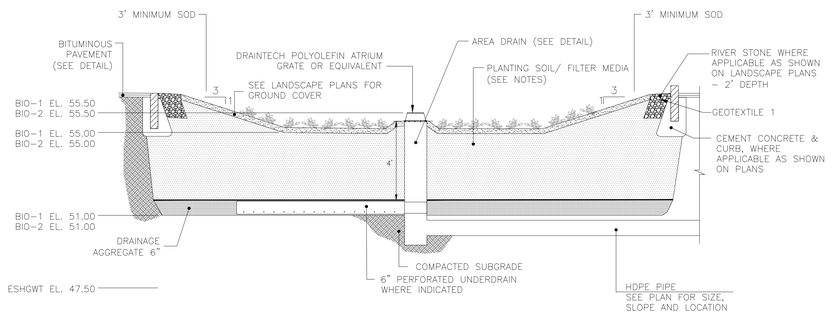


PLAN VIEW



SECTION B-B

REINFORCED CONCRETE WINGWALL DETAIL
NOT TO SCALE



BIO-RETENTION AREA NOTES

1. THE PLANTING SOIL/FILTER MEDIA SHOULD BE A MIXTURE OF SAND, COMPOST, AND SOIL:
   - 40% SAND *
   - 20-30% TOPSOIL *
   - 30-40% COMPOST *

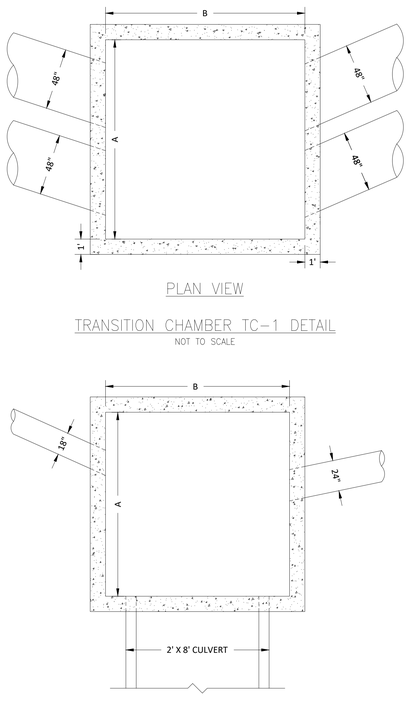
   * PERCENTAGES BY VOLUMES
2. THE SOIL MIX SHOULD BE UNIFORM, FREE OF STONES, STICKS, STUMPS, ROOTS, LARGER THAN 2 INCHES. CLAY CONTENT SHOULD NOT EXCEED 5%. SOIL PH SHOULD BE BETWEEN 5.5 AND 6.5 AND SHALL MEET ALL OTHER REQUIREMENTS OF SECTION 32.9320
3. THE SAND COMPONENT SHOULD BE GRAVELLY SAND THAT MEETS ASTM D 422.

   SIEVE SIZE PERCENT PASSING

2 INCH	100
3/4 INCH	70-100
1/4 INCH	50-80
No. 40	15-40
No. 200	0-3

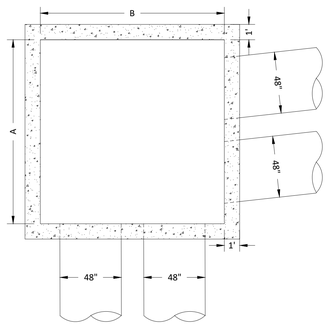
4. THE TOPSOIL COMPONENT SHALL BE A SANDY LOAM, LOAMY SAND OR LOAM TEXTURE.
5. THE COMPOST COMPONENT MUST BE PROCESSED FROM 6af COMPOST MEETING THE RISDISM RULES AND REGULATIONS FOR AGRICULTURAL COMPOSTING.
6. SEE LANDSCAPE PLANS FOR PLANTING SCHEDULE.

BIORETENTION AREA DETAIL
NOT TO SCALE



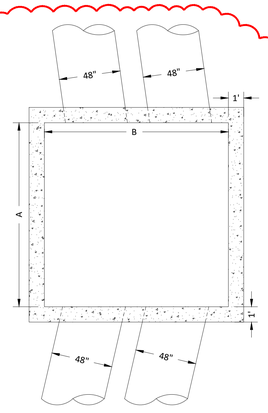
PLAN VIEW

TRANSITION CHAMBER TC-1 DETAIL
NOT TO SCALE



PLAN VIEW

TRANSITION CHAMBER TC-2 DETAIL
NOT TO SCALE



PLAN VIEW

TRANSITION CHAMBER TC-3 DETAIL
NOT TO SCALE

STRUCTURE	INV IN*	INV OUT*	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"
TC-1	44.96	44.96	13'	8'	8'-8"
TC-2	45.10	45.10	12'	12'	8'-6"
TC-3	45.95	45.95	8'	12'	9'-8"
DMH-313	SEE C5.2	SEE C5.2	8'	12'	4'-0"

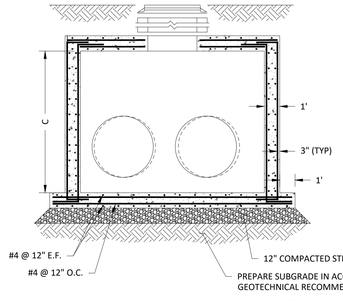
*SEE DETAIL NOTES 1 AND 2

PLAN VIEW

NOTES:

1. TC-1 AND TC-3 SHALL BE CONSTRUCTED FOR CONNECTION TO THE EXISTING 48" COMBINED SEWER PIPES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING ALL EXISTING DATA PRIOR TO INSTALLATION. THIS SHALL INCLUDE BUT IS NOT LIMITED TO, ELEVATIONS, DIMENSIONS, SPACING, AND PIPE ANGLE. THIS EXISTING INFORMATION SHALL BE INCLUDED IN SHOP DRAWINGS FOR TRANSITION CHAMBERS.
2. PROPOSED INVERT ELEVATIONS OF THE TWIN 48" PIPES ARE BASED ON EXISTING CONDITIONS DATA OBTAINED DURING DESIGN. THE CONTRACTOR SHALL CONFIRM EXISTING PIPE ELEVATIONS AT POINTS OF CONNECTION. INVERT ELEVATIONS SHALL BE ADJUSTED BASED ON EXISTING PIPE ELEVATIONS DETERMINED DURING THIS FIELD CONFIRMATION AND SHALL BE PROVIDED IN SHOP DRAWINGS FOR TRANSITION CHAMBERS.

TRANSITION CHAMBER DMH-313 DETAIL
NOT TO SCALE



TRANSITION CHAMBER SECTION VIEW

ADD-6

NOTE:
ANY MANUFACTURER'S NAMES AND/OR MODEL NUMBERS IDENTIFIED HEREIN ARE INTENDED TO ASSIST IN ESTABLISHING A GENERAL LEVEL OF QUALITY, CONFIGURATION, FUNCTIONALITY, AND APPEARANCE REQUIRED. THIS IS NOT A PROPRIETARY SPECIFICATION AND IT SHOULD BE NOTED THAT "OR APPROVED EQUIVALENT" APPLIES TO ALL PRODUCTS DENOTED HEREIN. IT IS UNDERSTOOD THAT ALL MANUFACTURERS WILL HAVE MINOR VARIATIONS IN CONFIGURATION, APPEARANCE, AND PRODUCT SPECIFICATION TO ENCOURAGE OPEN AND COMPETITIVE INVOLVEMENT FROM MULTIPLE MANUFACTURERS THAT ARE ABLE TO SUPPLY SIMILAR PRODUCTS.

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KEYNOTE LEGEND:

ADD-6 ADDENDUM #6 01.23.2024

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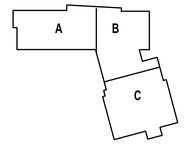
NORTH ARROW

KEYPLAN

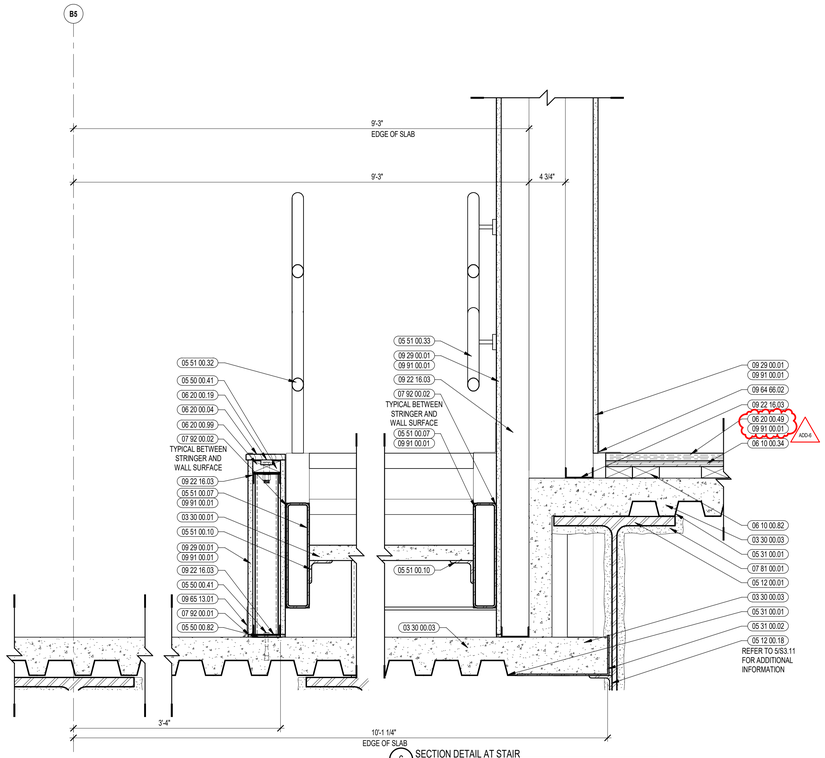


DRAWING NAME:

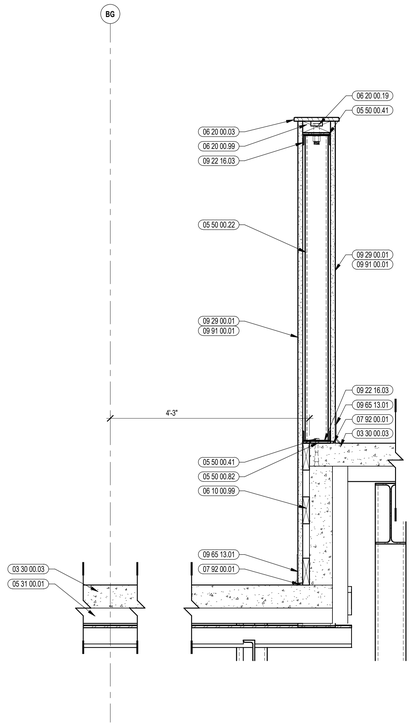
SITE DETAILS

DRAWN BY:	SMC
REVIEWED BY:	GBD
SCALE:	AS NOTED
JOB NO.:	77997
DATE:	OCTOBER 13, 2023

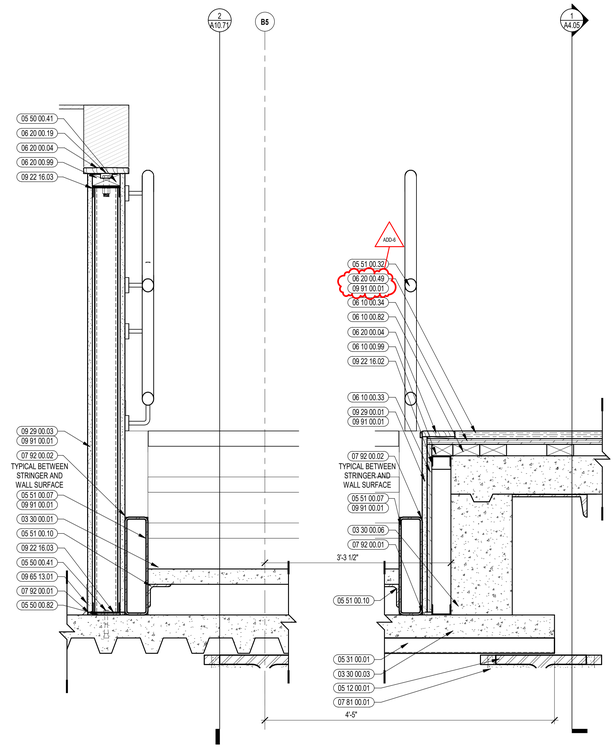
DRAWING NUMBER: C6.5



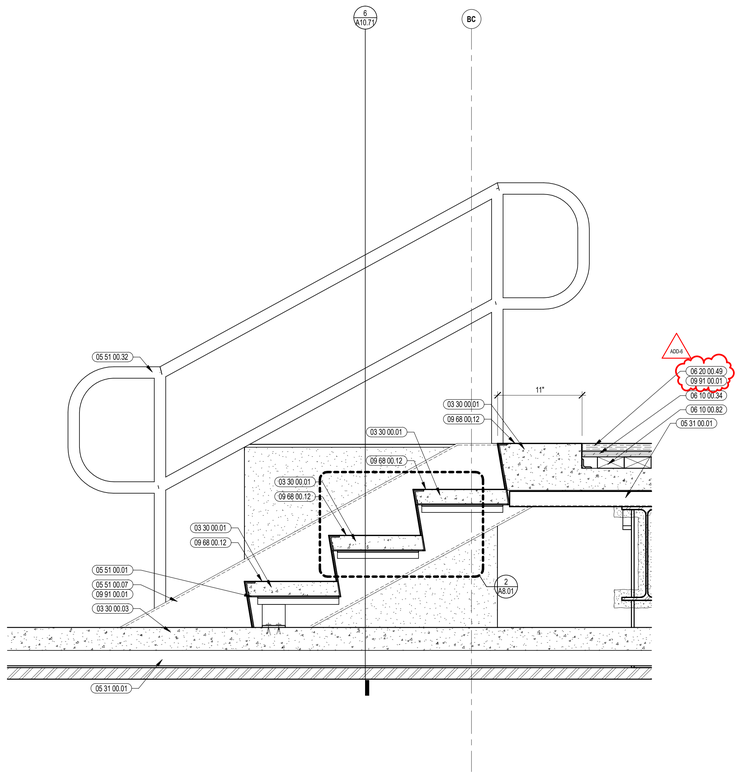
6 SECTION DETAIL AT STAIR
1 1/2" = 1'-0"



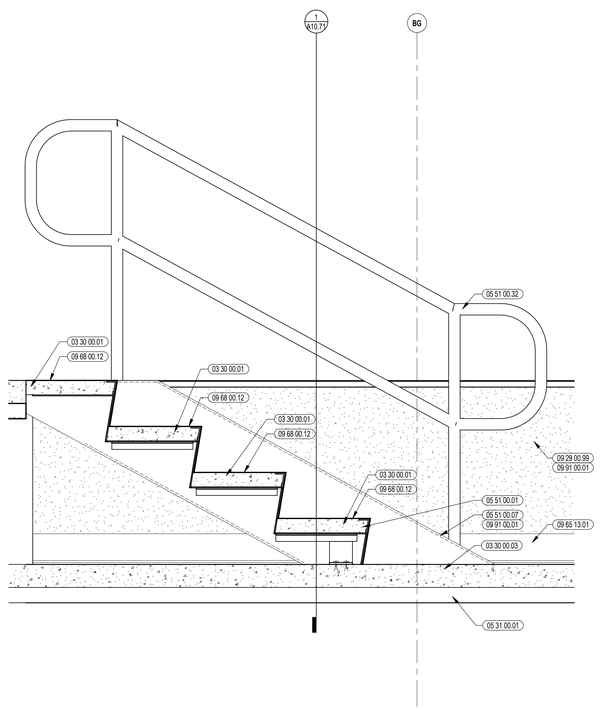
4 SECTION DETAIL AT PLATFORM
1 1/2" = 1'-0"



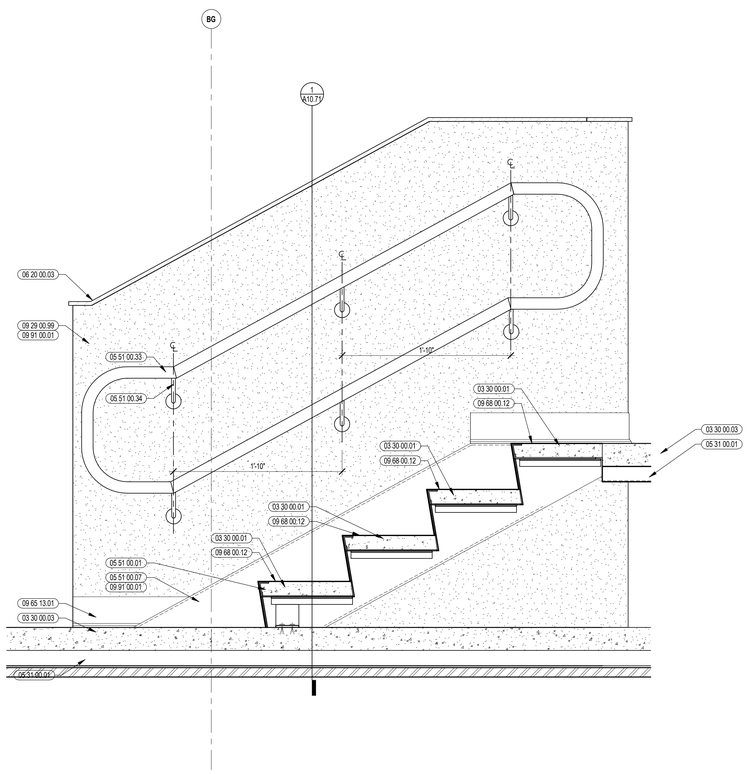
1 SECTION DETAIL AT STAIR
1 1/2" = 1'-0"



5 SECTION DETAIL AT STAIR
1 1/2" = 1'-0"



3 SECTION DETAIL AT STAIR
1 1/2" = 1'-0"



2 SECTION DETAIL AT STAIR
1 1/2" = 1'-0"

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KEYNOTE LEGEND:

03 30 00.01	CONCRETE
03 30 00.03	CONCRETE SLAB ON DECK - SEE STRUCTURAL
03 30 00.06	CONCRETE WALL - SEE STRUCTURAL
05 12 00.01	STEEL BEAM - SEE STRUCTURAL
05 12 00.18	STEEL ANGLE CONTINUOUS - SEE STRUCTURAL
05 31 00.01	COMPOSITE STEEL DECK - SEE STRUCTURAL
05 31 00.02	POUR STOP - FLOOR SLAB - SEE STRUCTURAL
05 50 00.22	STEEL TUBE - SIZE AS NOTED OR DRAWN
05 50 00.41	STEEL PLATE - 1/4 INCH THICK - SIZE AS NOTED OR DRAWN
05 50 00.82	EXPANSION BOLT
05 51 00.01	STEEL PAN TREAD AND RISER
05 51 00.07	STEEL TUBE STRINGER
05 51 00.10	STEEL ANGLE CONTINUOUS
05 51 00.32	STAINLESS STEEL INTERMEDIATE HANDRAIL WITH POSTS ANCHORED TO FLOOR
05 51 00.33	STAINLESS STEEL PIPE HANDRAIL - 1-1/2 INCH O.D.
05 51 00.34	STAINLESS STEEL HANDRAIL BRACKET
06 10 00.33	PLYWOOD - 5/8 INCH
06 10 00.34	PLYWOOD - 3/4 INCH
06 10 00.82	2X4 PRESSURE TREATED SLEEPERS - 16 INCHES O.C.
06 10 00.99	WOOD BLOCKING - SIZE AS NOTED OR DRAWN
06 20 00.03	HARDWOOD TRIM - EASED EDGE 1/4 INCH RADIUS - TRANSPARENT FINISH
06 20 00.04	HARDWOOD TRIM - BULLNOSE - TRANSPARENT FINISH
06 20 00.19	STAINLESS STEEL BOLTS - NUTS AND WASHERS - SIZE AS NOTED
06 20 00.49	HARDBOARD STAGE FLOORING
06 20 00.99	WOOD BLOCKING - SIZE AS NOTED OR DRAWN
07 81 00.01	CEMENTITIOUS FIREPROOFING
07 92 00.01	JOINT SEALANT - TYPE AS REQUIRED
07 92 00.02	BACKER ROD AND SEALANT - TYPE AS REQUIRED
09 22 16.02	METAL STUD 2-1/2 INCH - 16 INCHES O.C. MAX
09 22 16.03	METAL STUD 3-5/8 INCH - 16 INCHES O.C. MAX
09 29 00.01	5/8 INCH GYPSUM BOARD - LEVEL 4 FINISH - 1 LAYER
09 29 00.03	5/8 INCH GYPSUM BOARD - LEVEL 4 FINISH - 1 LAYER EACH SIDE
09 29 00.99	GYPSUM BOARD SYSTEM - LEVEL 4 FINISH - REFER TO FLOOR PLANS AND WALL TYPES FOR COMPONENTS
09 64 66.02	RUBBER COVE WALL BASE - VENTED
09 65 13.01	RUBBER BASE - 4 INCH
09 68 00.12	METAL CARPET REDUCING STRIP
09 91 00.01	PAINT - SEE SCHEDULE

ADD-6 ADDENDUM #6 01.23.2024

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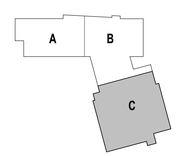
KEY PLAN NORTH ARROW

KEYPLAN



DRAWING NAME:

AUDITORIUM STAIR & GUARDRAIL DETAILS

DRAWN BY:	CHR
REVIEWED BY:	CHR / KK
SCALE:	AS INDICATED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	A10.71

NOTES:

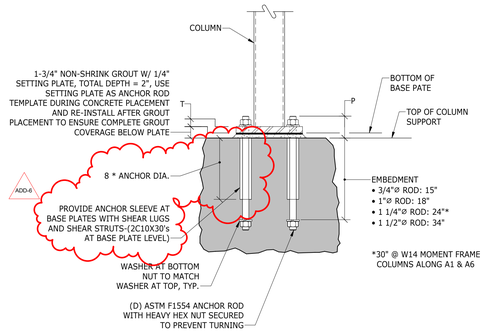
1. THE DIMENSIONS NOTED IN THE BASE PLATE SCHEDULE ARE TYPICAL, UNLESS NOTED OTHERWISE.
2. PROVIDE HOLES WITH ASTM A36 (TYP., A572 GR. 50 @ BRACED & MOMENT FRAMES) HEAVY PLATE WASHER IN BASE PLATES AS FOLLOWS:
   - 3/4"Ø ROD: 1 5/16"Ø HOLE, 2" X 2" X 1/4" WASHER
   - 1"Ø ROD: 1 13/16"Ø HOLE, 3" X 3" X 3/8" WASHER
   - 1 1/4"Ø ROD: 2 1/16"Ø HOLE, 3" X 3" X 1/2" WASHER
   - 1 1/2"Ø ROD: 2 5/16"Ø HOLE, 3 1/2" X 3 1/2" X 1/2" WASHER
   - 1 3/4"Ø ROD: 2 3/4"Ø HOLE, 4" X 4" X 5/8" WASHER

   SETTING/LEVELING PLATES SHALL BE USED AS AN ANCHOR ROD TEMPLATE AND SHALL BE FABRICATED WITH STANDARD HOLES (ROD DIAMETER + 1/16").
3. PLATE WASHERS SHALL BE WELDED TO THE BASE PLATES WITH TACK WELDS, TYP. ALL FOUR SIDES. AT BRACED AND MOMENT FRAME COLUMNS, USE 1/4" WELD ALL AROUND PLATE WASHER, EXCEPT AT COLUMN BASE PLATES WITH SHEAR LUGS OR SHEAR STRUTS - DO NOT WELD PLATE WASHER TO BASE PLATE AT THESE LOCATONS.
4. ANCHOR RODS ARE NOT PERMITTED TO BE TORQUED DURING COLUMN LEVELING OR INSTALLATION PROCESS. PROVIDE SNUG-TIGHT CONNECTION ONLY.

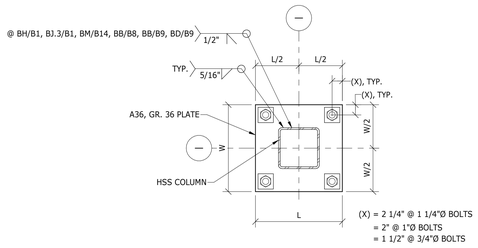
BASE PLATE SCHEDULE

	TYPE A			TYPE A1			TYPE A2			TYPE B			TYPE C			TYPE D			TYPE W		
	D		P	D		P	D		P	D		P	D		P	D		P	D		P
	*		7 1/2"	*		7 1/2"	*		7 1/2"	*		7 1/2"	*		7 1/2"	*		7 1/2"	*		8 1/2"
COLUMN SIZE	L	W	T	L	W	T	L	W	T	L	W	T	L	W	T	L	W	T	L	W	T
HSS6X6	1'-0"	1'-0"	1"	-	-	-	-	-	-	1'-1"	7"	1 1/2"	-	-	-	-	-	-	-	-	-
HSS8X8	1'-4"	1'-4"	1 1/2"	-	-	-	-	-	-	1'-5"	9"	1 1/2"	1'-1"	9"	1 1/4"	1'-3"	1'-6"	1 3/4"	-	-	-
HSS10X10	1'-6"	1'-6"	1 3/4"	-	-	-	1'-7"	1'-7"	1 3/4"	1'-8"	1'-0"	2"	-	-	-	1'-3"	1'-8"	1 3/4"	-	-	-
HSS12X8	-	-	-	1'-6"	1'-6"	1 3/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSS12X12	-	-	-	-	-	-	1'-11"	1'-11"	1 3/4"	1'-9"	1'-2"	1 1/2"	-	-	-	-	-	-	-	-	-
HSS14X10	-	-	-	-	-	-	-	-	-	1'-11"	1'-0"	1 1/2"	-	-	-	-	-	-	-	-	-
W10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1'-10"	1'-5"	1 3/4"
W14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2'-3"	1'-3"	2"
W18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2'-8"	1'-11"	2 1/4"

*** REFER TO BASE PLATE DETAILS FOR ANCHOR ROD DIAMETER**

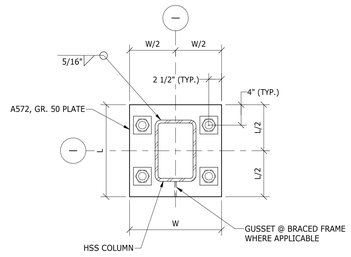


BASE PLATE ANCHORAGE



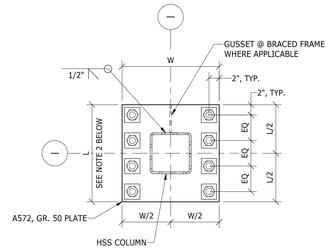
TYPE A

(4 - 1"Ø F1554 GR.36 A. BOLTS, TYP.)
(4 - 1 1/4"Ø F1554 GR.55 A. BOLTS @ BH/B1, BJ.3/B1, BM/B14, BB/B8, BB/B9, BD/B9, BR-7, BR-8, BR-9, BR-10, BR-12)
(4 - 3/4"Ø F1554 GR.36 A. BOLTS @ HSS6X6)



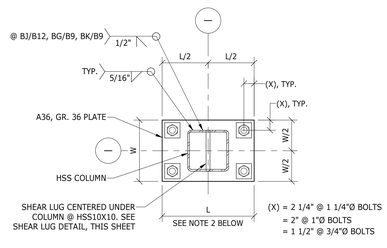
TYPE A1

(4 - 1 1/4"Ø F1554 GR.55 A. BOLTS)



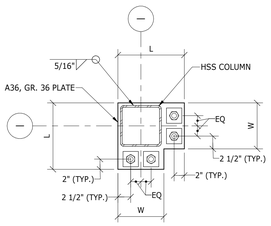
TYPE A2

(8 - 1 1/4"Ø F1554 GR.55 A. BOLTS, 4 BOLTS PER SIDE)



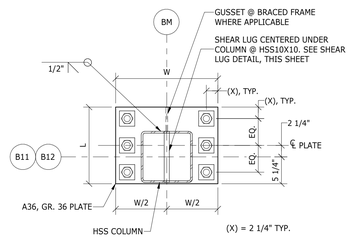
TYPE B

(4 - 1"Ø F1554 GR.36 A. BOLTS, TYP.)
(4 - 1"Ø F1554 GR.55 A. BOLTS @ HSS10X10)
(4 - 3/4"Ø F1554 GR.36 A. BOLTS @ HSS6X6)
(4 - 1 1/4"Ø F1554 GR.55 A. BOLTS @ HSS12X12 & HSS 14X10)



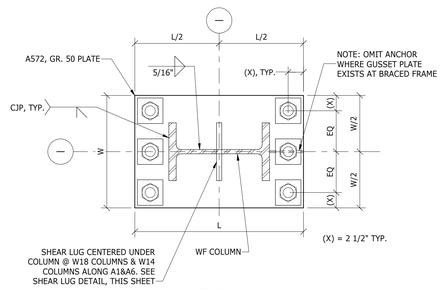
TYPE C

(4 - 1"Ø F1554 GR.36 A. BOLTS, TYP.)



TYPE D

(6 - 1 1/4"Ø F1554 GR.55 A. BOLTS, TYP.)



TYPE W

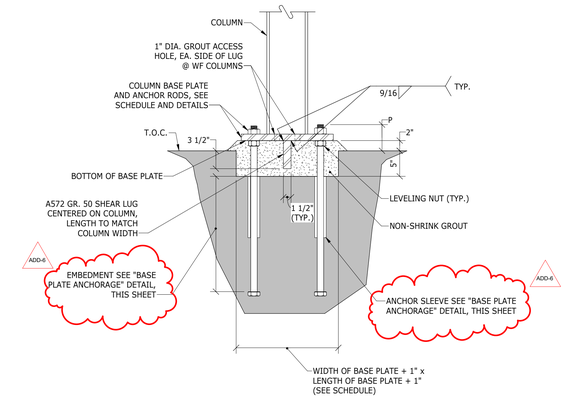
(WIDE-FLANGE COLUMN)
(8 - 1 1/2"Ø F1554 GR.55 A. BOLTS @ W18)
(6 - 1 1/4"Ø F1554 GR.55 A. BOLTS @ W14)
(6 - 1 1/4"Ø F1554 GR.55 A. BOLTS @ W10)

NOTES:

1. PLATE WASHERS SHALL BE WELDED TO BASE PLATES PER NOTE 3 OF BASE PLATE SCHEDULE.
2. LENGTH ("L") OF TYPE B BASE PLATE SHALL TYPICALLY BE ORIENTED PARALLEL TO FOUNDATION OR AS SHOWN IN DETAILS AT BRACED FRAME LOCATIONS (SEE GUSSET PLATE ORIENTATION). AT LOCATIONS LISTED BELOW, ORIENT AS FOLLOWS:
   - BH/B14: ALONG B14
   - COLUMNS ALONG B9&B10: ALONG B9&B10
   - COLUMNS ALONG B11&B12: ALONG B11&B12

TYPICAL BASE PLATE DETAILS

NOT TO SCALE



SHEAR LUG DETAIL

NOTES:

1. DETAIL ONLY APPLIES AT LOCATIONS SHOWN IN BASE PLATE DETAILS.
2. SEE BASE PLATE DETAILS FOR ORIENTATION OF SHEAR LUG (TYP.)
3. PIER REINFORCEMENT WITHIN FOOTPRINT OF SHEAR LUG BOX-OUT SHALL BEGIN BELOW BOX-OUT.

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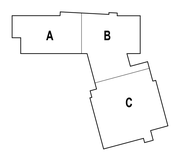
KEYNOTE LEGEND:

ADD-6 ADDENDUM #6 01.23.2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

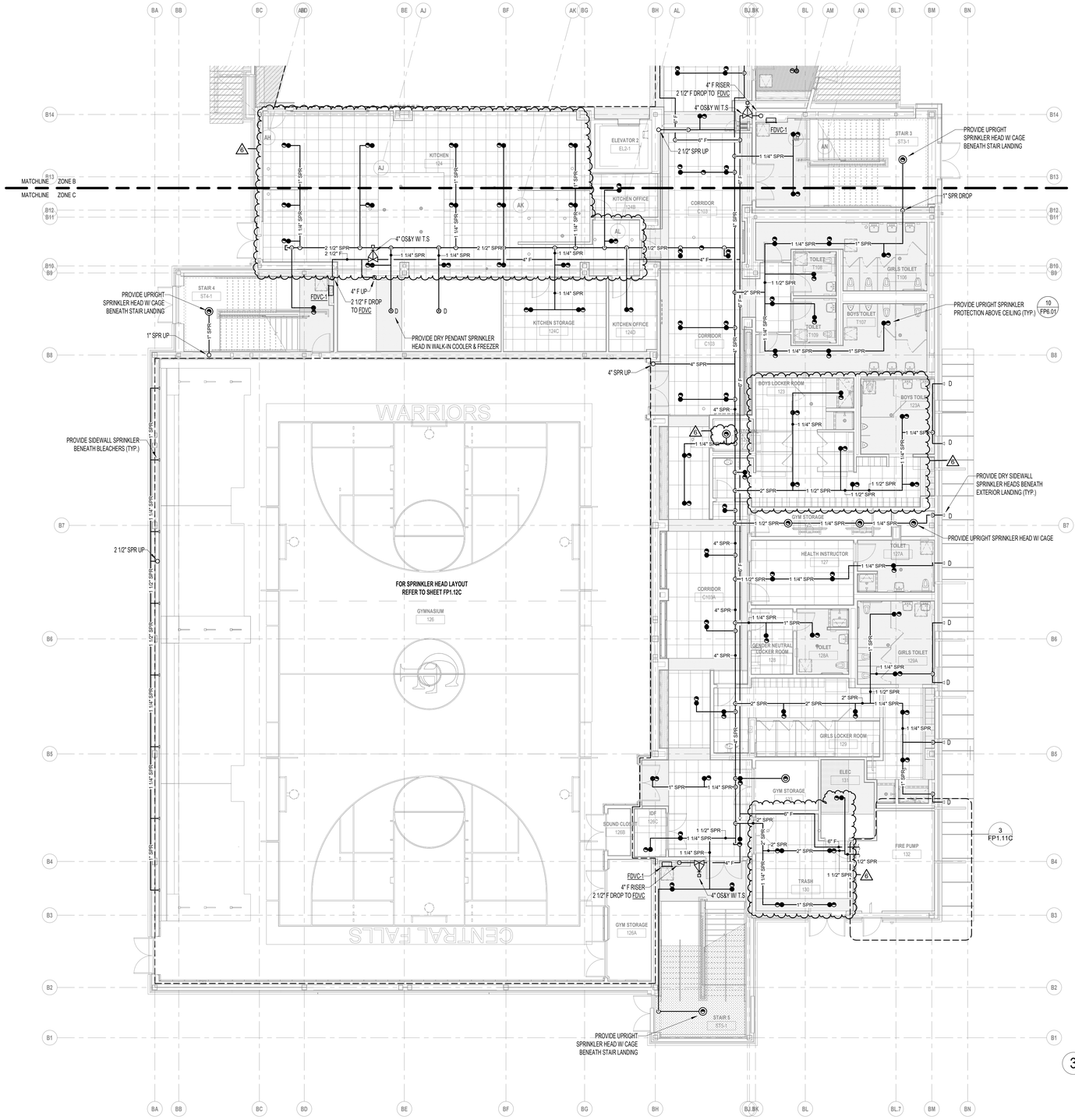
KEYPLAN



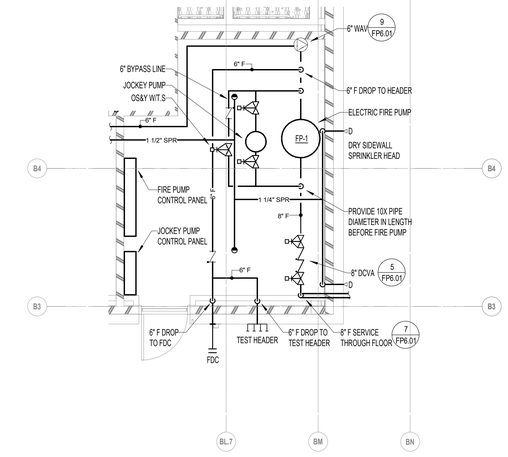
DRAWING NAME:

BASE PLATE AND PIER DETAILS - 1

DRAWN BY:	JDB / MSS
REVIEWED BY:	MGM / BP
SCALE:	AS INDICATED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	S2.20



1 FIRST FLOOR PLAN - ZONE C
Scale: 1/8" = 1'-0"



3 1-FIRST FLOOR PLAN - ENLARGED FIRE PUMP ROOM
Scale: 1/4" = 1'-0"

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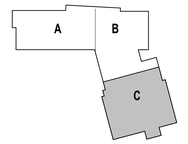
KEYNOTE LEGEND:

6	ADDENDUM 6	01/23/2024
3	ADDENDUM 3	01/09/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN



DRAWING NAME:

FIRE PROTECTION FIRST FLOOR PLAN - ZONE C

DRAWN BY: BSG
REVIEWED BY: AMD
SCALE: AS NOTED
JOB NO.: 2202.02
DATE: OCTOBER 13, 2023
DRAWING NUMBER: FP1.11C

1 SECOND FLOOR PLAN - ZONE B
1/8" = 1'-0"

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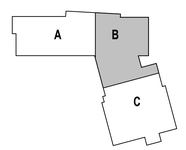
KEYNOTE LEGEND:

6	ADDENDUM 6	01/23/2024
3	ADDENDUM 3	01/09/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

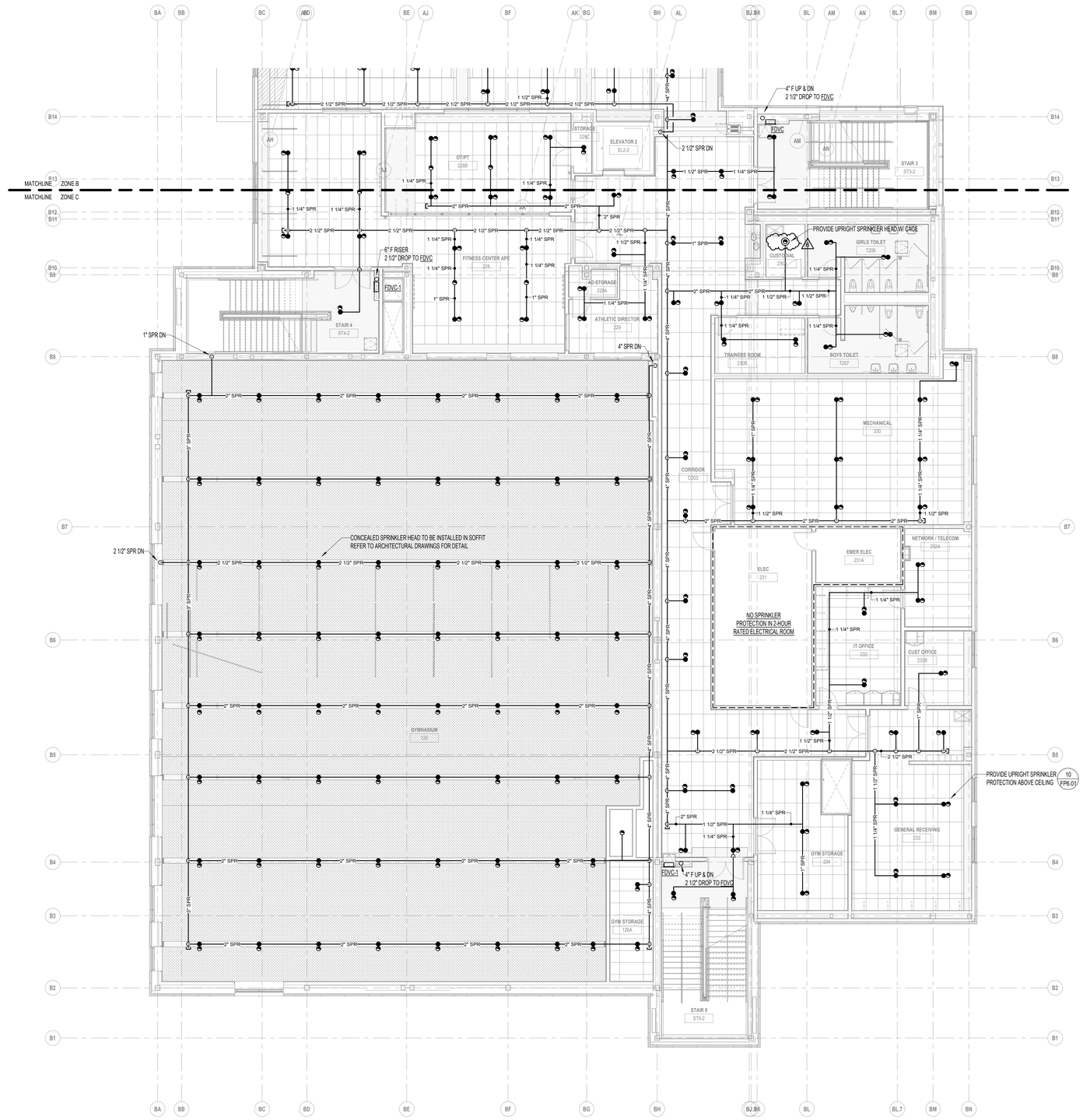


DRAWING NAME:

FIRE PROTECTION SECOND FLOOR PLAN - ZONE B

DRAWN BY:	BSG
REVIEWED BY:	AMD
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: FP1.12B



1 SECOND FLOOR PLAN - ZONE C
1/8" = 1'-0"

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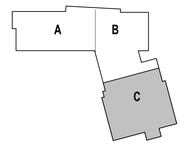
KEYNOTE LEGEND:

6	ADDENDUM 6	01/23/2024
3	ADDENDUM 3	01/09/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

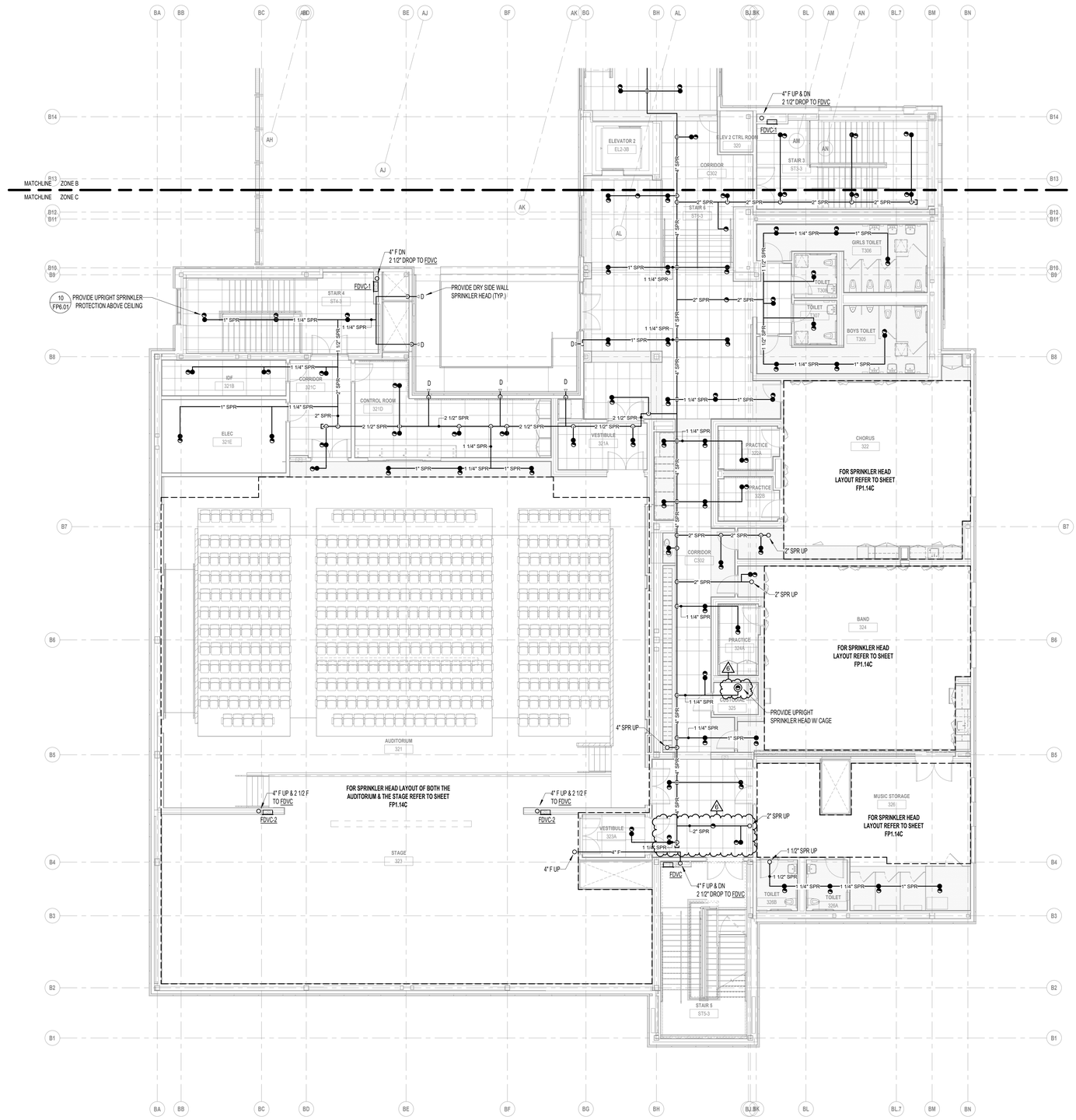
KEYPLAN



DRAWING NAME:

FIRE PROTECTION SECOND FLOOR PLAN - ZONE C

DRAWN BY:	BSG
REVIEWED BY:	AMD
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	FP1.12C



1 THIRD FLOOR PLAN - ZONE C
1/8" = 1'-0"

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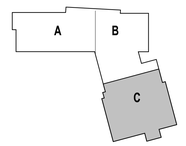
KEYNOTE LEGEND:

6	ADDENDUM 6	01/23/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN



DRAWING NAME:

FIRE PROTECTION THIRD FLOOR PLAN - ZONE C

DRAWN BY:	BSG
REVIEWED BY:	AMD
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: FP1.13C

ROOFTOP UNIT SCHEDULE

TAG	Estimated Weight (lbs)	Model	Electrical			Efficiency		Supply Fan						Exhaust Fan					Filtration	Energy Recovery						Cooling							Hot Water Heating			
																				Airflow		Wheel LAT				Recovered Capacity		EAT		LAT							
																						Cooling		Heating												
			Voltage	MCA	MOP	EER	IEER / ISMRE	Supply Airflow (CFM)	Outside Airflow (CFM)	ESP (inH_2O)	TSP (inH_2O)	Motor Size (qty @ HP)	BHP	Airflow (CFM)	ESP (inH_2O)	TSP (inH_2O)	Motor Size (qty @ HP)	BHP		Outside Air (CFM)	Exhaust Air (CFM)	LDB (°F)	LWB (°F)	LDB (°F)	LWB (°F)	Total Cooling (Btu/hr)	Sensible Heating (Btu/hr)	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	Total Capacity (MBH)	Sensible Capacity (MBH)	Modulating Hot Gas Reheat LDB (°F)	EDB (°F)	LDB (°F)	Flow (GPM)	Fluid PD (ft wg)
RTU-1 (Classroom)	7,267	VXE-312-30	460V/3ph	105.4	125.0	N/A	7	9,980	9,980	2.00	4.15	2 @ 7-1/2	4.65	9,980	1.00	2.25	2 @ 5	3.43	MERV 8 & MERV 13	9,980	9,980	78.7	65.8	52.8	43.9	273,951	515,208	78.7	65.8	52.8	52.8	388.4	279.1	77.1	52.8	83.3	34.6	11.1
RTU-2 (Classroom)	8,026	VXE-312-40	460V/3ph	119.2	125.0	N/A	6.1	12,390	12,390	2.00	4.96	2 @ 7-1/2	6.90	12,390	1.00	2.18	2 @ 7-1/2	4.99	MERV 8 & MERV 13	12,390	12,390	79.9	66.7	46.5	39.6	295,502	555,319	79.9	66.7	52.2	52.1	544.4	371.3	77.8	46.5	75.8	41.2	15.4
RTU-3 (Admin)	3,980	VX-212-20	460V/3ph	59.7	70.0	10.6	16.5	7,260	2,100	1.85	4.24	1 @ 10	7.63	7,260	1.00	1.13	1 @ 5	3.81	MERV 8 & MERV 13									79.0	65.8	52.5	52.4	292.3	211.2	82.2	52.6	84.6	26.4	1.3
RTU-4 (Cat-Kit)	4,525	VXE-212-15	460V/3ph	89.2	110.0	9.8	16.2	6,500	3,420	2.00	4.24	1 @ 7-1/2	6.70	6,500	1.00	1.82	1 @ 5	3.97	MERV 8 & MERV 13	3,420	3,420	78.6	65.9	53.2	43.8	92,340	178,031	76.9	64.3	46.1	46.0	330.7	219.5	80.9	62.1	105.8	32.3	2.3
RTU-4 (Cat-Kit) Hood								6,500	6,500					0														89.0	73.0	55.3	55.1	389.8	241.2	90.0	5.0	79.3	54.9	6.5
RTU-5 (Coor)	1,198	VX-12-2	460V/3ph	18.5	25.0	11.2	18.1	2,100	675	2.00	4.83	1 @ 3	2.50	2,100	1.00	1.11	1 @ 1-1/2	0.96	MERV 8 & MERV 13									79.5	66.2	54.9	54.9	72.7	55.8	73.7	50.5	94.9	10.6	8.0
RTU-6 (Music)	3,077	VXE-112-10	460V/3ph	35.1	50.0	11.1	17.8	3,250	1,885	2.00	3.75	1 @ 5	2.97	3,250	1.00	1.82	1 @ 3	1.87	MERV 8 & MERV 13	1,885	1,885	78.7	65.7	51.9	43.3	51,743	95,479	77.1	64.4	52.0	51.6	121.1	89.6	76.3	60.3	92.8	12.0	0.6
RTU-7 (Aud)	7,135	VXE-312-25	460V/3ph	74.8	90.0	9.8	11.4	9,225	6,100	1.50	3.18	2 @ 5	3.30	9,225	1.00	1.78	2 @ 5	2.58	MERV 8 & MERV 13	6,100	6,100	78.0	65.2	56.1	46.1	178,425	336,647	77.0	64.3	53.3	53.3	299.9	235.9	74.6	61.5	90.3	30.2	8.7
RTU-8 (Gym)	4,175	VXE-212-15	460V/3ph	60.8	90.0	11.3	20.7	5,500	3,800	1.50	3.34	1 @ 7-1/2	4.45	5,500	1.00	1.82	1 @ 5	2.84	MERV 8 & MERV 13	3,800	3,800	78.8	66.1	51.9	42.8	99,180	192,478	77.7	65.0	52.4	52.2	208.8	152.2	82.8	58.1	91.5	20.9	0.8
RTU-9 (Lock-Gym-Sup)	3,077	VXE-112-10	460V/3ph	31.9	45.0	N/A	8	2,500	2,500	2.00	3.52	1 @ 3	2.21	2,500	1.00	1.97	1 @ 2	1.40	MERV 8 & MERV 13	2,500	2,500	79.5	66.4	48.0	40.4	63,000	116,100	79.5	66.4	50.2	50.0	120.9	80.4	77.6	48.0	90.5	12.1	0.6

Schedule Notes:
1) Design Summer Conditions: OA 89F/73F; RA 75F/50%
2) Design Winter Conditions: OA 5F; RA 72F/35%
3) All units to have factory furnished SF and EF airflow measuring stations. Non 100% OA units to have factory installed OA airflow measuring station.
4) All units to have inverter lead compressor
5) All energy recovery wheels to have factory furnished VFD
6) All units to be single point power
7) All coils to be epoxy coated
8) All units to have stainless steel drain pan
9) All units to have factory powered GFI
10) Exhaust fans sized for 100% economizer mode
11) Hot water coils sized based on 160-140, 30% PG

(1) ACCEPTABLE ALT. MANUFACTURERS: HAKKON, SEASONS FOUR OR APPROVED EQUAL.
(2) COIL PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.

ENERGY RECOVERY VENTILATOR SCHEDULE

ITEM	MFG'R	MODEL	SERVICE	CFM			MAIN ELECTRICAL DATA					SUPPLY FAN DATA		EXHAUST/RETURN FAN DATA		ENTHALPY CORE SUMMER CONDITIONS			ENTHALPY CORE WINTER CONDITIONS			FILTER DATA		REMARKS
				SUP.	RET/EXH	O.A.	VOLTS	PH	HZ.	MCA	MOP	E.S.P.	WATTS	E.S.P.	WATTS	SUPPLY E.A.T.	SUPPLY LAT	EFF %	SUPPLY E.A.T.	SUPPLY L.A.T.	EFF %	TYPE	SIZE	
ERV-1	RENEWAIRE	HE10INH	FITNES ROOM & PT/OT	700	700	700	480	3	60	2.7	15	0.5"	860	0.5"	860	85	78.5	65	0	48.7	65	MERV 13	2"	

FAN COIL UNIT SCHEDULE

ITEM	MFG'R	MODEL	ARRANGEMENT	SERVICE	CFM	O.A. CFM	EXT. S.P.	HP	HEATING COIL DATA (2)								ELECTRICAL			FILTER DATA			REMARKS
									EDB	LDB	MBH	E.W.T. °F	L.W.T. °F	GPM	WPD	NO. ROWS	V.	PH.	HZ.	TYPE	SIZE	MFG'R	
FCU-1	DAIKIN	FCHH208	HORIZONTAL	WORKSHOP 233A	750	350	0.375"	1/4	57	95	38.5	160	130	2.4	1.48	2	115	1	60	MERV 8	2"	FARR	

(1) ACCEPTABLE ALT. MANUFACTURERS: NAILOR, CARRIER, AIRTHERM OR APPROVED EQUAL.
(2) BASED ON 30% PROPYLENE GLYCOL.

UNIT HEATER SCHEDULE

ITEM	MFG'R. (1)	MODEL	CFM	MBH	EWT °F	LWT °F	GPM	PD. FT. WG	MOTOR HP	MOTOR RPM	ELECTRICAL V	ELECTRICAL PH	ELECTRICAL HZ	REMARKS
UH-1	ZEHNDER-RITTLING	RH-24	450	10.2	160°F	140°F	1.0	0.3	1/30	0.7	120	1	60	
UH-2	ZEHNDER-RITTLING	RH-24	450	10.2	160°F	140°F	1.0	0.3	1/30	0.7	120	1	60	
UH-3	ZEHNDER-RITTLING	RH-24	450	10.2	160°F	140°F	1.0	0.3	1/30	0.7	120	1	60	
UH-4	ZEHNDER-RITTLING	RH-24	450	10.2	160°F	140°F	1.0	0.3	1/30	0.7	120	1	60	

(1) ACCEPTABLE ALT. MANUFACTURERS: VULCAN, RITTLING, ROSEMEX OR APPROVED EQUAL.
(2) COIL PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.

RADIANT PANEL SCHEDULE

ITEM	MFG'R. (1)	MODEL	PANEL DIMENSIONS WIDTH	PANEL DIMENSIONS LENGTH	EWT	LWT	GPM/LF	BTUH LIN. FT	REMARKS
RP-1	AREOTECH	LPD	12"	SEE PLANS	160°F	140°F	0.02	161	

(1) ACCEPTABLE ALT. MANUFACTURERS: STERLING, ZEHNDER-RITTLING OR APPROVED EQUAL.
(2) COIL PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.

AIR SEPARATOR SCHEDULE

ITEM	MFG'R (1)	MODEL	GPM	SIZE	LOCATION	SERVICE	REMARKS
AS-1	TACO	ACT05F	396	5"	BOILER ROOM	HOT WATER	

(1) ACCEPTABLE ALT. MANUFACTURERS: BELL & GOSSETT, SPIROTHERM OR APPROVED EQUAL.

EXPANSION TANK SCHEDULE

ITEM	MFG'R (1)	MODEL	GAL. CAP.	TANK DIA.	TANK HEIGHT	SYS. TEMP. (°F) MIN.	SYS. TEMP. (°F) MAX	PRE CHARGE	REMARKS
ET-1	TACO	CA900-125	238	30"	73"	55°F	160°F	18 psi	

(1) ACCEPTABLE ALT. MANUFACTURERS: BELL & GOSSETT, WESSELS OR APPROVED EQUAL.

ADD-6

ELECTRIC UNIT HEATER & CABINET UNIT HEATER SCHEDULE

ITEM	MFG'R. (1)	MODEL	CFM	ELEC. HEAT DATA KW	ELEC. HEAT DATA VOLT	ELEC. HEAT DATA PHASE	FAN DATA HP	FAN DATA VOLT	FAN DATA PHASE	BTU/HR	REMARKS
ECUH-1	NOT USED										
ECUH-2	NOT USED										
ECUH-3	NOT USED										
ECUH-4	NOT USED										
EUH-1	NOT USED										

(1) ACCEPTABLE ALT. MANUFACTURERS: BERKO, MODINE OR APPROVED EQUAL.

CONDENSATE PUMP SCHEDULE

ITEM	MFG'R.	MODEL	SIZE	PSI	HEAD FEET	MOTOR HP	MOTOR V	MOTOR ø	MOTOR WATTS	MOTOR AMPS	SERVICE	REMARKS
CP-1	LITTLE GIANT	VCCA-20P	12"x5"x5.09"	7.4	5'	1/30	115	1	60	1.5	DFC	
CP-2	LITTLE GIANT	VCCA-20P	12"x5"x5.09"	7.4	5'	1/30	115	1	60	1.5	DFC	

BOILER SCHEDULE

ITEM	MFG'R.	MODEL	FUEL INPUT NAT. GAS (MBH)	OUTPUT MBH	BOILER HP	MIN GAS PRESS	ELEC. DATA V	ELEC. DATA ø	ELEC. DATA AMPS	ELEC. DATA MCA	REMARKS
B-1	LOCHINVAR	FB 2501	2,500	2,400	75	4" WC	208	3	4.5	5.6	
B-2	LOCHINVAR	FB 2501	2,500	2,400	75	4" WC	208	3	4.5	5.6	

(1) BASED ON 30% PROPYLENE GLYCOL.

PUMP SCHEDULE

ITEM	MFG'R. (1)	MODEL	SERIES	SIZE	GPM	HEAD FEET	MOTOR DATA HP	MOTOR DATA V	MOTOR DATA ø	MOTOR DATA RPM	SERVICE	REMARKS
P-1	TACO	FI3009D	FI	4x3	393	75	10	480	3	1750	HOT WATER	–
P-2	TACO	FI3009D	FI	4x3	393	75	10	480	3	1750	HOT WATER	–
BP-1	TACO	1941	1900	2x2	200	25	3	480	3	1750	BOILER B-1	PROVIDE PUMP MOUNTED VFD
BP-2	TACO	1941	1900	2x2	200	25	3	480	3	1750	BOILER B-2	PROVIDE PUMP MOUNTED VFD

(1) ACCEPTABLE ALT. MANUFACTURERS: BELL & GOSSETT, ARMSTRONG OR APPROVED EQUAL.
(2) BASED ON 30% PROPYLENE GLYCOL.

SCH-33

VARIABLE FREQUENCY DRIVE SCHEDULE

ITEM	MFG'R. (1)	MODEL	SERVICE	MOTOR DATA HP	MOTOR DATA VOLTS	MOTOR DATA ø	MAX. OUTPUT CURRENT	MOUNT	CONTROL INPUT	BY-PASS	REMARKS
VFD-1	ABB	ACH550	P-1	10	480	3	23	WALL	4-20mA	YES	
VFD-2	ABB	ACH550	P-2	10	480	3	23	WALL	4-20mA	YES	

(1) ACCEPTABLE ALT. MANUFACTURERS: ABB, DANFOSS OR APPROVED EQUAL.

CONVECTOR SCHEDULE

ITEM	MFG'R (1)	MODEL	MBH	GPM	HEIGHT	LENGTH	DEPTH	REMARKS
CV-1	ZEHNDER-RITTLING	PL-18-24-04	1.2	0.1	18"	24"	4"	
CV-2	ZEHNDER-RITTLING	PL-18-24-04	1.2	0.1	18"	24"	4"	
CV-3	ZEHNDER-RITTLING	PL-18-24-04	1.2	0.1	18"	24"	4"	
CV-4	ZEHNDER-RITTLING	PL-18-24-04	1.2	0.1	18"	24"	4"	

(1) ACCEPTABLE ALT. MANUFACTURERS: VULCAN, RITTLING, ROSEMEX OR APPROVED EQUAL.
(2) COIL PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.
(3) EWT=160 / LWT=140

CABINET UNIT HEATER SCHEDULE

ITEM	MFG'R. (1)	MODEL	ARRANGEMENT	SIZE	CFM	MBH	GPM	HP	VOLT	PH	REMARKS
CUH-1	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-2	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-3	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-4	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-5	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-6	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-7	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-8	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	
CUH-9	ZEHNDER-RITTLING	RFRC	420	03	300	21.8	2.2	1/60	120	1	

(1) ACCEPTABLE ALT. MANUFACTURERS: VULCAN, STERLING, ROSEMEX OR APPROVED EQUAL.
(2) COIL PERFORMANCE BASED ON 30% PROPYLENE GLYCOL.
(3) EWT=160 / LWT=140

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KEYNOTE LEGEND:

ADD-6 ADDENDUM #6 01.23.2024
100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:
MECHANICAL SCHEDULES

DRAWN BY: AP
REVIEWED BY: DAH
SCALE: NTS
JOB NO.: 2202.00
DATE: OCTOBER 13, 2023
DRAWING NUMBER: M5.01

EXHAUST FAN SCHEDULE

ITEM	MFG'R. (5)	MODEL	DRIVE	SERVICE	INTERLOCK	CFM	SP IN. WC.	HP	FAN RPM	ELECTRICAL DATA V	PH	HZ	SONES	REMARKS
EF-1	GREENHECK	22 USF-200/300	BELT	KITCHEN HOOD EXH.	(7)	5907	2.0"	3.0	1253	208	3	60	·	
EF-2	GREENHECK	GB-120	BELT	DISHWASER ROOM	BMS	600	0.625"	1/4	1189	120	1	60	·	
EF-3	GREENHECK	G-090	DIRECT	GEN. KITCHEN EXH.	BMS	200	0.5"	1/4	1206	120	1	60	·	
EF-4	GREENHECK	G-090	DIRECT	CUSTODIAL	BMS	300	0.5"	1/4	1206	120	1	60	·	
EF-5	GREENHECK	SQ-70-VG	DIRECT	TRASH ROOM EXH.	BMS	200	0.25"	1/15	1439	120	1	60	3.7	
EF-6	FANTECH	DBF110	DIRECT	DRYER EXH. BOOSTER	PROOF SWITCH	167	·	80 WATTS	·	120	1	60	·	
EF-7	GREENHECK	SQ-70-VG	DIRECT	CHEM. STORAGE 418	BMS	150	0.25"	1/15	1439	120	1	60	3.7	
EF-8	GREENHECK	G-090-VG	DIRECT	KILN ROOM 317B	BMS	200	0.25"	1/6	1304	120	1	60	5.6	
EF-9	GREENHECK	SQ-70-VG	DIRECT	JAN. CLOSET 127B	BMS	100	0.25"	1/15	1439	120	1	60	3.7	
EF-10	GREENHECK	G-080-VG	DIRECT	JAN. CLOSET 325	BMS	100	0.25"	1/10	1201	115	1	60	5.3	
EF-11	FANTECH	DBF110	DIRECT	DRYER EXH. BOOSTER	PROOF SWITCH	167	·	80 WATTS	·	120	1	60	·	
EF-12	FANTECH	DBF110	DIRECT	DRYER EXH. BOOSTER	PROOF SWITCH	167	·	80 WATTS	·	120	1	60	·	
EF-13	NOT USED													
EF-14	GREENHECK	G-080-VG	DIRECT	JAN. CLOSET 230A	BMS	100	0.25"	1/10	1201	120	1	60	5.3	
EF-15	GREENHECK	SQ-100-VG	DIRECT	MECHANICAL 230	BMS	500	0.35"	1/4	1026	120	1	60	·	
EF-16	GREENHECK	SQ-90	DIRECT	DIVERSE LEAR. 202	INTERLOCK WITH HOOD CONTROLS	300	0.5"	1/10	1550	120	1	60	6.7	
EF-17	GREENHECK	SQ-90	DIRECT	DIVERSE LEAR. 204	INTERLOCK WITH HOOD CONTROLS	300	0.5"	1/10	1550	120	1	60	6.7	

(1) FAN TO BE FURNISHED WITH FACTORY MOUNTED AND WIRED DISCONNECT SWITCH, GREASE TRAP, VENTED CURB EXTENSION & HINGING KIT TO MEET NFPA96. FAN SHALL HAVE U.L. 762 LISTING.
(2) PROVIDE WITH ROOF CURB, BIRDSCREEN, MOTORIZED DAMPER & DISCONNECT SWITCH (FACTORY MOUNTED AND WIRED).
(3) PROVIDE WITH ROOF CURB, BIRDSCREEN, MOTORIZED DAMPER AND FACTORY MOUNTED AND WIRED SOLID STATE SPEED CONTROL MOUNTED AS A DISCONNECT SWITCH.
(4) PROVIDE WITH PITCH ROOF CURB, BIRDSCREEN, MOTORIZED DAMPER & DISCONNECT SWITCH (FACTORY MOUNTED AND WIRED).
(5) ACCEPTABLE ALT. MANUFACTURERS: PENN VENTILATOR CORP., COOK OR APPROVED EQUAL.
(6) FAN TO BE FURNISHED WITH GREASE TRAP, VENTED CURB EXTENSION & HINGING KIT TO MEET NFPA96. FAN SHALL HAVE U.L. 762 LISTING.
(7) FAN SHALL BE INTERLOCKED WITH KITCHEN HOOD CONTROL SYSTEM FURNISHED BY OTHERS.
(8) TIME CLOCK FURNISHED BY DIV 23 00 00, INSTALLED BY 26 00 00.

DUCTLESS SPLIT-TYPE AIR CONDITIONER SCHEDULE

ITEM	MFG'R	INDOOR UNIT MODEL	OUTDOOR UNIT MODEL	COOLING CAP. TOTAL MBH	HEATING CAP. TOTAL MBH	INDOOR FAN DATA MAX CFM	INDOOR ELEC. DATA VOLTS	ø	Hz	OUTDOOR COMP. DATA MOCP	MCA	OUTDOOR FAN DATA FLA	OUTDOOR ELEC. DATA VOLTS	ø	Hz	SEER	ROOM SERVED	REMARKS
DFC-1-1/CU-1-1	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	DIVERSE LEARNERS 101	(1)(2)(3)
DFC-1-2/CU-1-2	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	DIVERSE LEARNERS 103	(1)(2)(3)
DFC-1-3/CU-1-3	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	DIVERSE LEARNERS 105	(1)(2)(3)
DFC-1-4/CU-1-4	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	IDF 106	(1)(2)(3)
DFC-1-5/CU-1-5	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 107	(1)(2)(3)
DFC-1-6/CU-1-6	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	KITCH OFF. 124B	(1)(2)(3)
DFC-1-7/CU-1-7	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	KITCH OFF. 124D	(1)(2)(3)
DFC-1-8/CU-1-8	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	HEALTH INST. 127	(1)(2)(3)
DFC-1-9/CU-1-9	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 131	(1)(2)(3)
DFC-1-10/CU-1-10	MITSUBISHI	PKA-A36KAB	PUY-A36NKA7	36.0	N/A	920	POWERED BY OUTDOOR			31	25	0.5 + 0.5	208	1	60	19.4	IDF 126C	(1)(2)(3)
DFC-1-11/CU-1-11	MITSUBISHI	PKA-A12LA1	PUY-A12NKA7	12.0	N/A	385	POWERED BY OUTDOOR			28	11	0.5	208	1	60	21.3	SOUND CLOSET 126B	(1)(2)(3)
DFC-2-1/CU-2-1	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	DIVERSE LEARNERS 202	(1)(2)(3)
DFC-2-2/CU-2-2	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	DIVERSE LEARNERS 204	(1)(2)(3)
DFC-2-3/CU-2-3	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	IDF 206	(1)(2)(3)
DFC-2-4/CU-2-4	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 207	(1)(2)(3)
DFC-2-5/CU-2-5	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	ATH. DIR. 229	(1)(2)(3)
DFC-2-6/CU-2-6	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	TRAINER ROOM 230B	(1)(2)(3)
DFC-2-7/CU-2-7	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 231	(1)(2)(3)
DFC-2-8/CU-2-8	MITSUBISHI	PLA-A24EA7	PUY-A24NHA7	24.0	N/A	810	POWERED BY OUTDOOR			26	19	0.5 + 0.5	208	1	60	24.2	EM. EL. ROOM 231A	(1)(2)(3)
DFC-2-9/CU-2-9	MITSUBISHI	PLA-A42EA7	PUY-A42NKA7	42.0	N/A	880	POWERED BY OUTDOOR			31	25	0.4	208	1	60	21.0	NETWORK ROOM 232A	(1)(2)(3)
DFC-2-9A/CU-2-9A	MITSUBISHI	PLA-A42EA7	PUY-A42NHA7	42.0	N/A	880	POWERED BY OUTDOOR			31	25	0.4	208	1	60	21.0	NETWORK ROOM 232A	(1)(2)(3)
DFC-2-10/CU-2-10	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	IT OFFICE 232	(1)(2)(3)
DFC-2-11/CU-2-11	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	CUST. OFFICE 233B	(1)(2)(3)
DFC-2-12/CU-2-12	MITSUBISHI	PEAD-A24AA7	PUZ-HA24NHA1	24.0	28.0	570	POWERED BY OUTDOOR			27	17	0.5 + 0.5	208	1	60	16.6	OT/PT 228B	(1)(2)(3)
DFC-2-13/CU-2-13	MITSUBISHI	PEAD-A36AA7	PUZ-HA36NKA	36.0	40.0	1024	POWERED BY OUTDOOR			40.0	24	0.5 + 0.5	208	1	60	17.1	FITNESS CENTER 228	(1)(2)(3)
DFC-2-14/CU-2-14	MITSUBISHI	PKA-A12LA1	PUY-A12NKA7	12.0	N/A	385	POWERED BY OUTDOOR			28	11	0.5	208	1	60	21.3	SOUND CLOSET 227A	(1)(2)(3)
DFC-3-1/CU-3-1	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	IDF 306	(1)(2)(3)
DFC-3-2/CU-3-2	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 307	(1)(2)(3)
DFC-3-3/CU-3-3	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	IDF 321B	(1)(2)(3)
DFC-3-4/CU-3-4	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 321E	(1)(2)(3)
DFC-3-5/CU-3-5	MITSUBISHI	PLA-A12EA7	PUY-A12NKA7	12.0	N/A	530	POWERED BY OUTDOOR			28	15	0.5 + 0.5	208	1	60	27	CONTROL ROOM 321D	(1)(2)(3)
DFC-4-1/CU-4-1	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	IDF 406	(1)(2)(3)
DFC-4-2/CU-4-2	MITSUBISHI	PLA-A36EA7	PUY-A36NKA7	36.0	N/A	1200	POWERED BY OUTDOOR			30	25	0.5 + 0.5	208	1	60	21.8	ELEC. 409	(1)(2)(3)

(1) UNITS TO BE FURNISHED WITH CONDENSATE DRAIN PUMP.
(2) UNITS TO BE FURNISHED WITH LOW AMBIENT OPERATION CAPABILITY.
(3) ACCEPTABLE ALT. MANUFACTURERS: DAIKIN, SANYO OR APPROVED EQUAL.

SOUND ATTENUATOR SCHEDULE

ITEM	MFG'R (1)	RTU	MODEL	CFM	TOTAL LENGTH IN.	INLET DIMENSIONS W X H	OUTLET DIMENSIONS W X H	VELOCITY FPM	SILENCER P.D. IN. W.G.	HORIZ. CENTERLINE LENGTH	VERT. CENTERLINE LENGTH	SHAPE	DYNAMIC INSERTION LOSS Hz 63	125	250	500	1K	2K	4K	8K	REMARKS
SA-1	COMMERCIAL ACOUSTICS	RTU-1 SUPPLY	18EV60	9980	60	82x36	40x16	487	0.03	3'-0"	2'-0"	ELBOW	4	8	16	25	37	35	30	24	
SA-2	COMMERCIAL ACOUSTICS	RTU-1 RETURN	16EV36	-9980	36	80x16	80x16	-1123	0.19	1'-0"	2'-0"	ELBOW	3	8	12	13	17	18	18	16	
SA-3	COMMERCIAL ACOUSTICS	RTU-2 SUPPLY	18EV60	12390	60	82X36	40x16	604	0.13	3'-0"	2'-0"	ELBOW	8	18	26	28	33	31	27	21	
SA-4	COMMERCIAL ACOUSTICS	RTU-2 RETURN	16EV60	-12390	60	80x16	80x20	-1394	0.15	3'-0"	2'-0"	ELBOW	6	11	19	22	28	27	21	17	
SA-5	COMMERCIAL ACOUSTICS	RTU-3 SUPPLY	SMP	7260	60	36X14	36X14	2074	0.28	5'-0"	0'-0"	STRAIGHT	5	10	18	28	41	38	27	14	
SA-6	COMMERCIAL ACOUSTICS	RTU-3 RETURN	16EV60	-7260	60	56X16	56X16	-1167	0.13	3'-0"	2'-0"	ELBOW	6	11	18	22	28	27	21	17	
SA-7	COMMERCIAL ACOUSTICS	RTU-4 SUPPLY	16EV60	6500	60	56X16	56X16	1045	0.14	3'-0"	2'-0"	ELBOW	5	9	16	23	29	28	24	19	
SA-8	COMMERCIAL ACOUSTICS	RTU-4 RETURN	14EV60	-6500	60	52x28	52x28	-643	0.14	3'-0"	2'-0"	ELBOW	7	10	17	24	31	30	26	20	
SA-9	COMMERCIAL ACOUSTICS	RTU-5 SUPPLY	HPA	2100	60	24x18	24x18	700	0.16	5'-0"	0'-0"	STRAIGHT	9	17	25	39	46	45	40	25	
SA-10	COMMERCIAL ACOUSTICS	RTU-5 RETURN	SP-LF	-2100	60	36X12	36x12	-700	0.10	5'-0"	0'-0"	STRAIGHT	11	14	27	30	29	17	15	12	
SA-11	COMMERCIAL ACOUSTICS	RTU-6 SUPPLY	14EV60	3250	60	36x14	36X14	929	0.14	3'-0"	2'-0"	ELBOW	6	10	17	24	31	30	26	20	
SA-12	COMMERCIAL ACOUSTICS	RTU-6 RETURN	14EV60	-3250	60	36x14	36X14	-929	0.05	3'-0"	2'-0"	ELBOW	3	6	11	17	28	26	22	18	
SA-13	COMMERCIAL ACOUSTICS	RTU-7 SUPPLY	21EV60	9225	60	43X43	43X43	718	0.05	3'-0"	2'-0"	ELBOW	5	8	15	21	28	26	22	18	
SA-14	COMMERCIAL ACOUSTICS	RTU-7 RETURN	12EV36	-9225	36	54X24	54X24	-1025	0.10	1'-0"	2'-0"	ELBOW	3	6	13	13	13	18	24	21	
SA-15	COMMERCIAL ACOUSTICS	RTU-8 SUPPLY	SP-LF	5500	60	42x20	42x20	943	0.19	5'-0"	0'-0"	STRAIGHT	9	12	24	28	27	16	12	11	
SA-16	COMMERCIAL ACOUSTICS	RTU-8 RETURN	20EV60	-5500	60	42x20	42x20	-943	0.14	3'-0"	2'-0"	ELBOW	7	10	20	28	40	38	30	24	
SA-17	COMMERCIAL ACOUSTICS	·	HP-EE	1500	24	16X12	16X12	1125	0.18	2'-0"	0'-0"	STRAIGHT	2	6	12	18	26	32	23	14	
SA-18	COMMERCIAL ACOUSTICS	·	SP-LF	-1500	24	24X12	24X12	-750	0.09	2'-0"	0'-0"	STRAIGHT	5	7	14	17	15	12	9	8	

(1) ACCEPTABLE ALT. MANUFACTURERS: VIBRO ACOUSTICS, KINETICS NOISE CONTROL OR APPROVED EQUAL.

ROOF INTAKE & RELIEF VENT SCHEDULE

ITEM	MFG'R	MODEL	CFM MAX.	THROAT AREA SQ. FT.	SP MAX	CURB HEIGHT	REMARKS
GV-1	GREENHECK	GRSR-12	450	0.82	0.031"	16"	FURNISH WITH WELDED ALUMINUM CURB AND MOTORIZED DAMPER

DIFFUSER, REGISTER & GRILLE SCHEDULE

ITEM	MFG'R (1)	MODEL	SIZE	NECK	CFM MAX.	THROW	BORDER TYPE	REMARKS
S-1	NAILOR	6500	–	6x6	125	SEE PLANS	S, L	
S-2	NAILOR	6500	–	9x9	280	SEE PLANS	S, L	
S-3	NAILOR	6500	–	12x12	500	SEE PLANS	S, L	
S-4	NAILOR	FLV	–	–	92 CF//LF	25'	·	1.5" SLOT WITH 1 SLOT MIN. L=60" W/ FIELD FABRICATED PLENUM
S-5	NAILOR	FLH	–	–	335	SEE PLANS	–	2.5" SLOT WIDTH, 2 SLOT 10" INLET 5FT. WITH NAILOR PLENUM
S-6	NAILOR	FLV	–	–	360	SEE PLANS	–	1" SLOT WIDTH, 1 SLOT 12" INLET 5FT. WITH NAILOR PLENUM
R-1	NAILOR	51EC	–	6x6	125	N/A	S, L	
R-2	NAILOR	51EC	–	8x8	250	N/A	S, L	
R-3	NAILOR	51EC	–	10x10	400	N/A	S, L	
R-4	NAILOR	51EC	–	12x12	600	N/A	S, L	
R-5	NAILOR	51EC	–	14x14	850	N/A	S, L	
R-6	NAILOR	FLR15	–	–	220 CFM/LF	N/A	–	1.5" SLOT WIDTH,2 SLOT WITH FIELD FABRICATED PLENUM
R-7	NAILOR	FLR15	–	–	120 CFM/LF	N/A	–	1.5" SLOT WIDTH,2 SLOT WITH CONTINUOUS PRESSURED PLENUM
R-8	NAILOR	5010R	–	–	154 CFM/LF	N/A	–	1" SLOT WIDTH,4 SLOT WITH FIELD FABRICATED PLENUM
E-1	NAILOR	51EC	–	6x6	125	N/A	S, L	
E-2	NAILOR	51EC	–	8x8	250	N/A	S, L	
E-3	NAILOR	51EC	–	10x10	400	N/A	S, L	
T-1	NAILOR	51EC	–	8x8	160	N/A	S, L	

(1) ACCEPTABLE ALT. MANUFACTURERS: METAL-AIRE, PRICE, OR APPROVED EQUAL.

WALL CAP SCHEDULE

ITEM	MFG'R (1)	MODEL	SIZE	DIMENSION	REMARKS
WC-1	BROAN	885BL	4"	6.5"x6.5"	
WC-2	BROAN	885BL	4"	6.5"x6.5"	WITHOUT SCREEN
WC-3	BROAN	WC63B	3-1/4X14	16.5"x6.0"	WITH BACKDRAFT DAMPER AND BIRD SCREEN
WC-4	BROAN	843BL	6"	9.0"x9.0"	WITH BACKDRAFT DAMPER AND BIRD SCREEN
WC-5	BROAN	610FA	10"	14-3/4"x10"	WITH BACKDRAFT DAMPER AND BIRD SCREEN

(1) OR APPROVED EQUAL.

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KEYNOTE LEGEND:

ADD-6	ADDENDUM #6	01.23.2024	
ADD-3	ADDENDUM #3	01.09.2024	

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:
MECHANICAL SCHEDULES

DRAWN BY: AP
REVIEWED BY: DAH
SCALE: NTS
JOB NO.: 2202.00
DATE: OCTOBER 13, 2023
DRAWING NUMBER: M5.02

LIGHTING:

- A — LIGHT FIXTURE (LUMINAIRE) AND OUTLET ON NORMAL CIRCUIT.
- B
- C
- D — DOWNLIGHT FIXTURE (LUMINAIRE) AND OUTLET ON NORMAL CIRCUIT.
- E — WALL MOUNTED LIGHT FIXTURE (LUMINAIRE) AND OUTLET ON NORMAL CIRCUIT.
- F — STRIP LIGHT FIXTURE (LUMINAIRE) AND OUTLET ON NORMAL CIRCUIT.
- G — LIGHT FIXTURE SYMBOLS WITH FULL SHADING ARE CONNECTED TO EMERGENCY/LIFE SAFETY CIRCUIT.
- H — LIGHT FIXTURE SYMBOLS WITH HALF SHADING ARE CONNECTED TO CRITICAL CIRCUIT.
- J — TRACK WITH TRACK HEAD LIGHT FIXTURES (LUMINAIRES). REFER TO PLANS FOR LENGTH OF TRACK AND NUMBER OF TRACK HEAD LIGHT FIXTURES ON THE TRACK.
- SINGLE FACE EXIT SIGN WITH OUTLET AND ARROWS AS INDICATED ON PLAN. "E" DESIGNATION INDICATES TOP OF EXIT SIGN TO BE AT 18" A.F.F. "H" DESIGNATION INDICATES HANDICAP TYPE EXIT SIGN.
- DUAL FACE EXIT SIGN WITH OUTLET AND ARROWS AS INDICATED ON PLAN.
- COMBINATION EMERGENCY BATTERY UNIT/EXIT SIGN WITH INTEGRAL EMERGENCY LIGHT HEADS, WITH OUTLET.
- SINGLE FACE "NOT AN EXIT" SIGN WITH OUTLET.
- REMOTE SINGLE EMERGENCY LIGHT HEAD.
- REMOTE DUAL EMERGENCY LIGHT HEADS.
- EB — EMERGENCY BATTERY UNIT WITH INTEGRAL LIGHT HEADS.
- SPA1 — SPORTS LIGHTER LIGHT FIXTURES (LUMINAIRES).
- SL1 — SINGLE HEAD SITE LIGHT FIXTURE (LUMINAIRE). REFER TO POLE BASE DETAIL.
- SL2 — DUAL HEAD SITE LIGHT FIXTURE (LUMINAIRE). REFER TO POLE BASE DETAIL.
- SLB — BOLLARD SITE LIGHT FIXTURE (LUMINAIRE). REFER TO POLE BASE DETAIL.
- SL3 — POST TOP SITE LIGHT FIXTURE (LUMINAIRE). REFER TO FLUSH MOUNTED IN GRADE DETAIL.
- SL5 — RECESSED STEP LIGHT FIXTURE (LUMINAIRE).
- O.R. LIGHT FIXTURE FURNISHED BY OWNER. INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR.

LIGHTING CONTROL:

- Sa — SINGLE POLE SWITCH MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- S3a — THREE WAY SWITCH MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- S4a — FOUR WAY SWITCH MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SDa — DIMMER SWITCH MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SD3a — THREE WAY DIMMER SWITCH MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLEDa — LED PRESET, SINGLE POLE, AND THREE WAY DIMMER EQUAL TO LEGRAND #RH4FBL3PTW MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SX — CLASS 1, DIVISION 2, EXPLOSION PROOF LIGHT SWITCH.
- SWP — SINGLE POLE SWITCH WITH WEATHERPROOF COVER MOUNTED AT 48" A.F.F. TO CENTER.
- TC — TIMECLOCK.
- P — PHOTOCELL.
- ES — DIMMING SYSTEM ENTRY STATION.

DIGITAL SYSTEM:

- SLa — SINGLE BUTTON LOW VOLTAGE DIGITAL SWITCH, EQUAL TO WATT STOPPER #LMSW-101, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLab — TWO BUTTON LOW VOLTAGE DIGITAL SWITCH, EQUAL TO WATT STOPPER #LMSW-102, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLabc — THREE BUTTON LOW VOLTAGE DIGITAL SWITCH, EQUAL TO WATT STOPPER #LMSW-103, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLabcd — FOUR BUTTON LOW VOLTAGE DIGITAL SWITCH, EQUAL TO WATT STOPPER #LMSW-104, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLabcdefgh — EIGHT BUTTON LOW VOLTAGE DIGITAL SWITCH, EQUAL TO WATT STOPPER #LMSW-108, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- SLDa — LOW VOLTAGE DIGITAL DIMMING SWITCH, EQUAL TO WATT STOPPER #LMDM-101, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES LIGHT FIXTURE CONTROL.
- OS1a — CEILING MOUNTED DIGITAL PASSIVE INFRARED OCCUPANCY SENSOR, EQUAL TO WATT STOPPER #LMPC-100. MOUNT AT LEAST 6'-0" FROM A SUPPLY REGISTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES. PROVIDE CAT 5e CABLE TO ROOM CONTROLLER.
- OS2a — CEILING MOUNTED DIGITAL DUAL TECHNOLOGY PASSIVE INFRARED AND ULTRASONIC OCCUPANCY SENSOR, EQUAL TO WATT STOPPER #LMDC-100. MOUNT AT LEAST 6'-0" FROM A SUPPLY REGISTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES. PROVIDE CAT 5e CABLE TO ROOM CONTROLLER.
- OS3a — CEILING MOUNTED DIGITAL ULTRASONIC OCCUPANCY SENSOR, EQUAL TO WATT STOPPER #LMUC-100-2. MOUNT AT LEAST 6'-0" FROM A SUPPLY REGISTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES. PROVIDE CAT 5e CABLE TO ROOM CONTROLLER.
- OS4a — CEILING MOUNTED DIGITAL PASSIVE INFARED OCCUPANCY SENSOR WITH EXTENDED HEIGHT LENS (FOR HIGH CEILINGS), EQUAL TO WATT STOPPER #LMPC-100-5. MOUNT AT LEAST 6'-0" FROM A SUPPLY REGISTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE15 MINUTES. PROVIDE CAT 5e CABLE TO ROOM CONTROLLER.
- OS1 a — WALL MOUNTED PASSIVE INFRARED OCCUPANCY SENSOR WITH INTEGRAL SWITCH, MANUAL-ON UNLESS OTHERWISE NOTED. EQUAL TO WATT STOPPER #DSW-301. MOUNTED AT 48" A.F.F. TO CENTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES.
- OS2 a — WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR WITH TWO INTEGRAL SWITCHES, MANUAL-ON UNLESS OTHERWISE NOTED. EQUAL TO WATT STOPPER #DSW-302. MOUNTED AT 48" A.F.F. TO CENTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES.
- OS3 a — WALL MOUNTED DUAL TECHNOLOGY PASSIVE INFRARED AND ULTRASONIC 0-10V DIMMING OCCUPANCY SENSOR WITH TWO INTEGRAL SWITCHES, MANUAL-ON UNLESS OTHERWISE NOTED. EQUAL TO WATT STOPPER #DW-311. MOUNTED AT 48" A.F.F. TO CENTER. LOWER CASE LETTER INDICATES SWITCH CONTROL. TIME DELAY SHALL BE 15 MINUTES.
- DT — WALL MOUNTED MANUAL-ON DIGITAL TIME SWITCH, EQUAL TO WATT STOPPER #TS-400, MOUNTED AT 48" A.F.F. TO CENTER. TIME DELAY SHALL BE 15 MINUTES.
- D — CEILING MOUNTED OPEN LOOP PHOTOSENSOR FOR DAY LIGHT HARVESTING UP TO THREE ZONES OF DIMMING, EQUAL TO WATT STOPPER #LMLS-500. PHOTOSENSOR PLACEMENT PER MANUFACTURER'S RECOMMENDED LOCATIONS. PLACEMENT ON FLOOR PLANS IS DIAGRAMMATICAL, REFER TO PHOTOSENSOR PLACEMENT DETAIL. PHOTOSENSOR CONTROLS DAY LIGHT ZONES AS INDICATED ON THE LIGHTING CONTROL DETAILS.

POWER OUTLETS:

ALL RECEPTACLES SHALL BE MOUNTED AT 18" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED. THE FOLLOWING DESIGNATIONS SHALL APPLY TO ALL RECEPTACLE TYPES.

C = MOUNTED AT 6" ABOVE BACK SPLASH TO BOTTOM, REFER TO ARCHITECTURAL ELEVATIONS.
CP = FOR CONDENSATE PUMP. MOUNT ABOVE ACCESSIBLE CEILING, SURFACE MOUNT TO STRUCTURE.
CM = CEILING MOUNTED.
IG = ISOLATED GROUND.
MF = MOUNTED IN FURNITURE, REFER TO ARCHITECTURAL ELEVATIONS.
T = TABLET CHARGING STATION, MOUNTED AT 48" A.F.F. TO CENTER.
WP = WEATHERPROOF.
Y = MOUNT ADJACENT TO TECHNOLOGY OUTLET.
H = PROVIDED WITH HVAC EQUIPMENT, CIRCUIT AS INDICATED.
CW = MOUNTED ON FACE OF CASEWORK; REFER TO ARCHITECTURAL ELEVATIONS.
XP = CLASS 1, DIVISION 2, EXPLOSION PROOF.
G = GOGGLE CABINET.
P = MOUNT ADJACENT TO PROJECTOR OUTLET.
PC = CONTROLLED BY DIGITAL PLUG LOAD ROOM CONTROLLER.

- DUPLEX RECEPTACLE.
- GROUND FAULT CIRCUIT INTERRUPTING DUPLEX RECEPTACLE.
- DOUBLE DUPLEX RECEPTACLE.
- EMERGENCY DUPLEX RECEPTACLE.
- EMERGENCY GROUND FAULT CIRCUIT INTERRUPTING DUPLEX.
- EMERGENCY DOUBLE DUPLEX RECEPTACLE.
- GROUND FAULT CIRCUIT INTERRUPTING DOUBLE DUPLEX RECEPTACLE.
- SPECIAL PURPOSE RECEPTACLE, RECEPTACLE TO MATCH EQUIPMENT REQUIREMENTS. RATING AS INDICATED BY CIRCUIT BREAKER SIZE.
- GROUND FAULT CIRCUIT INTERRUPTING TRIPLEX RECEPTACLE.
- TRIPLEX RECEPTACLE.
- DUPLEX RECEPTACLE WITH ONE HALF SWITCHED. SUBSCRIPT INDICATES SWITCH CONTROL.
- U2 — 2 USB CHARGERS WITH DUPLEX RECEPTACLE.
- U4 — 4 USB CHARGER RECEPTACLE.
- 120V, 20A TWIST LOCK RECEPTACLE NEMA L5-20R, MOUNTED TO CABLE TRAY, ABOVE THE REAR OF THE RACK.
- 120V, 20A TWIST LOCK RECEPTACLE NEMA L5-20R, WALL MOUNTED.
- 208V, 1Ø 20A TWIST LOCK RECEPTACLE NEMA L6-20R, MOUNTED TO CABLE TRAY, ABOVE THE REAR OF THE RACK.
- 208V, 1Ø 20A TWIST LOCK RECEPTACLE NEMA L6-20R, WALL MOUNTED.
- 120V, 30A TWIST LOCK RECEPTACLE NEMA L5-30R, MOUNTED TO CABLE TRAY, ABOVE THE REAR OF THE RACK.
- 120V, 30A TWIST LOCK RECEPTACLE NEMA L5-30R, WALL MOUNTED.
- CR — WHITE CORD REEL, WITH 12/3, 45' SJEO CORD, AND BLACK PORTABLE OUTLET BOX WITH TWO DUPLEX RECEPTACLES ON END. PROVIDE SINGLE RECEPTACLE ON CEILING AT CORD REEL LOCATION FOR PLUGGING IN CORD REEL.
- TV — FLUSH MOUNTED FLOOR BOX WITH RECEPTACLES AND TECHNOLOGY OUTLETS AS INDICATED IN FLOOR BOX ON ELECTRICAL AND TECHNOLOGY DRAWINGS. PROVIDE CONDUIT FROM EACH INDIVIDUAL TECHNOLOGY OUTLET AS INDICATED TO ABOVE ACCESSIBLE CEILING OF ROOM WHICH FLOOR BOX IS LOCATED. COORDINATE COVER COLOR WITH ARCHITECT IN FIELD.
- TV — TWO HOUR RATED POKE-THRU WITH RECEPTACLES AND TECHNOLOGY OUTLETS AS INDICATED IN POKE-THRU ON ELECTRICAL AND TECHNOLOGY DRAWINGS. PROVIDE CONDUIT FROM EACH INDIVIDUAL TECHNOLOGY OUTLET AS INDICATED TO ABOVE ACCESSIBLE CEILING OF ROOM WHICH POKE-THRU IS LOCATED. COORDINATE COVER COLOR WITH ARCHITECT IN FIELD.
- P — FLUSH MOUNTED FLOOR BOX EQUAL TO WIREMOLD FLUSH FURNITURE FEED SERIES. PROVIDE WITH FURNITURE FEED POWER WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- P — FIRE RATED POKE-THRU EQUAL TO WIREMOLD FLUSH FURNITURE FEED SERIES. PROVIDE WITH FURNITURE FEED POWER WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- P — JUNCTION BOX IN WALL WITH COVER AND POWER WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- SURFACE METAL RACEWAY, EQUAL TO WIREMOLD SERIES 3000. PROVIDE WITH RECEPTACLES AS INDICATED ON PLANS WITH ACCESSORIES (ELBOWS, COVERS, COUPLINGS, ETC.) FOR A CONTINUOUS, COMPLETE INSTALLATION. COLOR BY ARCHITECT, IVORY OR GRAY.
- SURFACE METAL RACEWAY, EQUAL TO WIREMOLD SERIES 4000. PROVIDE WITH RECEPTACLES AND TECHNOLOGY OUTLETS AS INDICATED ON PLANS WITH ACCESSORIES (ELBOWS, COVERS, COUPLINGS, DIVIDERS, ETC.) FOR A CONTINUOUS, COMPLETE INSTALLATION. COLOR BY ARCHITECT, IVORY OR GRAY.
- PLUGMOLD.
- TELEPHONE/POWER/DATA/TELEPHONE/VIDEO POLE WITH OUTLETS AND RECEPTACLES AS SPECIFIED.
- FV — FLUSH VALVE/FAUCET SENSOR POWER CONNECTION TO ALL TRANSFORMERS FOR PLUMBING FIXTURES IN ROOM COORDINATE EXACT REQUIREMENTS AND LOCATIONS WITH PLUMBING SUBCONTRACTOR.
- DC — DROP CORD WITH STRAIN RELIEF AND SINGLE RECEPTACLE ON END, ELECTRICAL SUBCONTRACTOR TO DETERMINE CORD LENGTH IN FIELD.
- PR1 — PAD MOUNTED ALUMINUM WEATHERPROOF PEDESTAL WITH (2) GFCI WEATHERPROOF RECEPTACLES AND LOCKING DOOR AS MANUFACTURED BY LEGRAND MODEL #XCSPP2GRR-BK-XCSLOCK-BK OR EQUAL. COLOR SHALL BE BLACK. REFER TO PAD MOUNTED PEDESTAL DETAIL.
- LBP — LAB BENCH PEDESTAL EQUAL TO LEGRAND MODEL #LBP2, WITH DIVIDER. FOR POWER SIDE, PROVIDE DUPLEX GFCI RECEPTACLE WITH 3/4" CONDUIT STUB BASEPLATE. FOR LOW VOLTAGE SIDE, REMOVE BLANK PLATE, DO NOT INSTALL 3/4" CONDUIT STUB BASEPLATE, AND PROVIDE BULL NOSE FACEPLATE.

TELEPHONE/DATA/VIDEO OUTLETS (EMPTY BACK BOX AND CONDUIT SYSTEM):

- TELEPHONE OUTLET MOUNTED 18" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED. PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 3/4"C. TO ABOVE ACCESSIBLE CEILING. "W" INDICATES FOR WALL TELEPHONE, MOUNTED 48" A.F.F. TO CENTER, "C" INDICATES MOUNTED 6" ABOVE COUNTER BACK SPLASH TO BOTTOM.
- DATA OUTLET MOUNTED 18" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED. PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 3/4"C. TO ABOVE ACCESSIBLE CEILING. "C" INDICATES MOUNTED 6" ABOVE COUNTER BACK SPLASH TO BOTTOM.
- TELEPHONE/DATA OUTLET MOUNTED 18" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED. PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 3/4"C. TO ABOVE ACCESSIBLE CEILING. "C" INDICATES MOUNTED 6" ABOVE COUNTER BACK SPLASH TO BOTTOM.
- TV — VIDEO OUTLET MOUNTED 18" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED. PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 3/4"C. TO ABOVE ACCESSIBLE CEILING. "C" INDICATES MOUNTED 6" ABOVE COUNTER BACK SPLASH TO BOTTOM.
- T — FLUSH MOUNTED FLOOR BOX EQUAL TO WIREMOLD FLUSH FURNITURE FEED SERIES. PROVIDE WITH FURNITURE FEED TEL/DATA WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- T — FIRE RATED POKE THRU EQUAL TO WIREMOLD FLUSH FURNITURE FEED SERIES. PROVIDE WITH FURNITURE FEED TEL/DATA WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- T — JUNCTION BOX IN WALL WITH COVER AND TEL/DATA WHIP FOR CONNECTION TO PRE-WIRED FURNITURE.
- AP — WIRELESS ACCESS POINT, CEILING MOUNTED UNLESS OTHERWISE NOTED, PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 1"C. TO ABOVE ACCESSIBLE CEILING.
- SECURITY CAMERA OUTLET MOUNTED AT 10'-0" A.F.F. TO CENTER, UNLESS OTHERWISE NOTED, PROVIDE 4" SQUARE BACK BOX, SINGLE GANG RAISED COVER, BLANK PLATE, AND PULL STRING, WITH 1"C. TO ABOVE ACCESSIBLE CEILING.

FIRE ALARM/MASS NOTIFICATION:

- FACP — FIRE ALARM CONTROL PANEL.
- LOC — MASS NOTIFICATION LOCAL OPERATOR CONTROL PANEL.
- FAA — FIRE ALARM ANNUNCIATOR PANEL.
- F — FIRE ALARM COMBINATION HORN OR SPEAKER/STROBE, AS PER SPECIFICATIONS, WALL MOUNTED AT 80" A.F.F. TO BOTTOM OF LENS OR 6" BELOW CEILING WHICHEVER IS LOWER. "WP" INDICATES WEATHERPROOF, "WG" INDICATES WITH WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED, "8W" DENOTES 8 WATT HIGH AUDIO OUTPUT SPEAKER.
- F — FIRE ALARM / MASS NOTIFICATION ADDRESSABLE VISIBLE ONLY STROBE UNIT, WITH TWO LENSES, (CLEAR AND AMBER) AS PER SPECIFICATIONS, WALL MOUNTED AT 80" A.F.F. TO BOTTOM OF CLEAR LENS OR 6" BELOW CEILING WHICHEVER IS LOWER. "WP" INDICATES WEATHERPROOF, "WG" INDICATES WITH WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED, "8W" DENOTES 8 WATT HIGH AUDIO OUTPUT SPEAKER.
- M — MASS NOTIFICATION ADDRESSABLE VISIBLE ONLY STROBE UNIT/SPEAKER, WITH LENS (AMBER) AS PER SPECIFICATIONS, WALL MOUNTED AT 80" A.F.F. TO BOTTOM OF LENS OR 6" BELOW CEILING WHICHEVER IS LOWER. "WP" INDICATES WEATHERPROOF, "WG" INDICATES WITH WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED, "8W" DENOTES 8 WATT HIGH AUDIO OUTPUT SPEAKER.
- S — FIRE ALARM ADDRESSABLE SPEAKER, WALL MOUNTED AT 90" A.F.F. TO TOP OR 6" BELOW CEILING WHICHEVER IS LOWER. "CLG" INDICATES MOUNTED ON CEILING. (ADD-6)
- PB — MASS NOTIFICATION PANIC ALARM, PROVIDE STAINLESS STEEL MUSHROOM BUTTON LABELED "EMERGENCY", WITH A CLEAR LEXAN PLASTIC COVER TO PROTECT THE DEVICE.
- Lf — FIRE ALARM LOW FREQUENCY AUDIO OUTPUT/VISUAL ALARM, WALL MOUNTED AT 80" A.F.F. TO BOTTOM OF LENS OR 6" BELOW CEILING WHICHEVER IS LOWER. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED.
- Lf — FIRE ALARM LOW FREQUENCY AUDIO OUTPUT ALARM, WALL MOUNTED AT 90" A.F.F. TO TOP OR 6" BELOW CEILING WHICHEVER IS LOWER..
- F — FIRE ALARM STROBE WALL MOUNTED AT 80" A.F.F. TO BOTTOM OF LENS OR 6" BELOW CEILING WHICHEVER IS LOWER. "WP" INDICATES WEATHERPROOF, "WG" INDICATES WITH WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED.
- F — FIRE ALARM COMBINATION HORN OR SPEAKER/STROBE, AS PER SPECIFICATIONS, MOUNTED ON CEILING, "WP" INDICATES WEATHERPROOF, "WG" INDICATES WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED.
- F — FIRE ALARM STROBE MOUNTED ON CEILING, "WP" INDICATES WEATHERPROOF, "WG" INDICATES WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED.
- M — MASS NOTIFICATION ADDRESSABLE VISIBLE ONLY STROBE UNIT, WITH LENS (AMBER) AS PER SPECIFICATIONS, CEILING MOUNTED. "WP" INDICATES WEATHERPROOF, "WG" INDICATES WITH WIREGUARD. CANDELA RATING SHALL BE 15, UNLESS OTHERWISE NOTED.
- F — FIRE ALARM BEACON, WALL MOUNTED AT 80" A.F.F. OR FINISHED GRADE TO CENTER.
- H — FIRE ALARM HORN, WALL MOUNTED AT 90" A.F.F. TO TOP OR 6" BELOW CEILING WHICHEVER IS LOWER. "CLG" INDICATES MOUNTED ON CEILING.
- F — FIRE ALARM PULL STATION WALL MOUNTED AT 48" A.F.F. TO CENTER. "WG" INDICATES WITH WIREGUARD.
- S — FIRE ALARM SMOKE DETECTOR.
- S T — FIRE ALARM TRANSMITTER/RECIEVER BEAM SMOKE DETECTOR.
- S R — FIRE ALARM REFLECTOR FOR BEAM SMOKE DETECTOR.
- FATC — FIRE ALARM TERMINAL CABINET.
- SCP — SMOKE CONTROL PANEL.
- MNCP — MASS NOTIFICATION CONTROL PANEL.
- MNTP — MASS NOTIFICATION/FIRE ALARM TRANSPONDER PANEL.
- MNSPK — MASS NOTIFICATION HIGH POWER EXTERIOR SPEAKER ARRAY.
- MNAMP — MASS NOTIFICATION HIGH POWER EXTERIOR SPEAKER ARRAY AMPLIFIER.
- IC — INCIDENT COMMANDER (SEE SPECIFICATIONS). GRAPHIC CONTROLLER.
- STS — FIRE ALARM KEYED REMOTE TEST STATION FOR BEAM SMOKE DETECTOR, WALL MOUNTED AT 48" A.F.F. IN CORRIDOR BELOW BEAM SMOKE DETECTOR.
- H — FIRE ALARM COMBINATION RATE OF RISE AND ONE HUNDRED THIRTY FIVE DEGREE TO ONE HUNDRED FORTY DEGREE FIXED TEMPERATURE HEAT DETECTOR. "FT" INDICATES FIXED ONE HUNDRED NINETY DEGREE TO TWO HUNDRED DEGREE TEMPERATURE, "AC" INDICATES ABOVE CEILING.
- WE — WEATHERPROOF AND EXPLOSION PROOF HEAT DETECTOR.
- CO — WALL MOUNTED FIRE ALARM CARBON MONOXIDE DETECTOR. REFER TO MANUFACTURER'S REC0MMENDATIONS FOR MOUNTING HEIGHT. PROVIDE WIRE GUARD OVER DETECTOR.
- DS — FIRE ALARM DUCT SMOKE DETECTOR, FURNISHED AND WIRED BY ELECTRICAL SUBCONTRACTOR, INSTALLED BY HVAC SUBCONTRACTOR.
- RTS — FIRE ALARM KEYED REMOTE TEST STATION FOR DUCT SMOKE DETECTOR, WALL MOUNTED AT 48" A.F.F. IN CORRIDOR BELOW DUCT SMOKE DETECTOR.
- DH — FIRE ALARM DOOR HOLDER (WALL MOUNTED).
- DH — FIRE ALARM DOOR HOLDER (FLOOR MOUNTED).
- F — WALL MOUNTED FIRE ALARM MASTER BOX.
- R — WALL MOUNTED FIRE ALARM RADIO MASTER BOX.
- A — FIRE ALARM RADIO MASTER BOX ANTENNA, MOUNT AT HIGHEST POINT ON BUILDING EXTERIOR.
- GSM — FIRE ALARM CELLULAR COMMUNICATOR.
- K — WALL MOUNTED FIRE ALARM KEY BOX, KNOX 3200 SERIES, TO BE INSTALLED AS PER FIRE DEPARTMENT REQUIREMENTS.
- FIRE ALARM REMOTE INDICATOR LED, MOUNTED 6" ABOVE DOOR TO BOTTOM.
- TS — FIRE ALARM TAMPER SWITCH, PROVIDED BY FIRE PROTECTION SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- FS — FIRE ALARM FLOW SWITCH, PROVIDED BY FIRE PROTECTION SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- PS — FIRE ALARM PRESSURE SWITCH, PROVIDED BY FIRE PROTECTION SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- PIV — FIRE ALARM POST INDICATING VALVE, PROVIDED BY FIRE PROTECTION SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- CR — FIRE ALARM ADDRESSABLE CONTROL RELAY MODULE.
- MR — RELAY, SPACE AGE #MR201
- M — FIRE ALARM ADDRESSABLE MONITOR MODULE.
- IM — FIRE ALARM ADDRESSABLE ISOLATION MODULE.
- SYN — FIRE ALARM SYNCHRONIZATION MODULE.
- FPS — WALL MOUNTED FIRE ALARM POWER EXPANDER UNIT FOR NOTIFICATION APPLIANCES.
- F — FIRE-O-MATIC.
- DR — FIRE ALARM DRILL SWITCH, WALL MOUNTED AT 48" A.F.F. TO CENTER.
- MSB — WALL MOUNTED ADDRESSABLE TEXTUAL NOTIFICATION APPLIANCE (TEXT MESSAGE BOARD). VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH ARCHITECT/ OWNER'S REPRESENTATIVE PRIOR TO THE START OF ANY WORK.
- FD — FIRE SMOKE DAMPER, PROVIDED BY MECHANICAL SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- FB — FIRE ALARM BELL, PROVIDED BY FIRE PROTECTION SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- SH — SMOKE HATCH, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- SHC — SMOKE HATCH CONTROLLER, WALL MOUNTED AT 48" A.F.F. TO CENTER, FURNISHED BY GENERAL CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO SMOKE HATCH, VIA 1"C., SUBSCRIPT INDICATES SMOKE HATCH CONTROL.

NOTE FOR LOCAL FIRE ALARM DEVICES:
INTERCONNECT ALL LOCAL FIRE ALARM DEVICES AS PER MANUFACTURER'S SPECIFICATIONS WITHIN EACH APARTMENT SO THAT IF ANY DEVICE INITIATES AN ALARM, ALL DEVICES IN THAT APARTMENT WILL GO INTO ALARM. WHERE APARTMENTS ARE NOT BEING COMPLETELY RENOVATED, CONNECT NEW FIRE ALARM DEVICES TO EXISTING APARTMENT LOCAL FIRE ALARM DEVICE 120V CIRCUIT OR IF NOT AVAILABLE, EXISTING UNSWITCHED 120V CIRCUIT.

- SD — LOCAL ONLY SELF CONTAINED SMOKE ALARM, 120V, PHOTOELECTRIC TYPE, WITH BATTERY BACKUP, INTERCONNECTABLE.
- SC — LOCAL ONLY SELF CONTAINED COMBINATION SMOKE/CARBON MONOXIDE ALARM, 120V, WITH BATTERY BACKUP, INTERCONNECTABLE.
- CO — LOCAL ONLY SELF CONTAINED CARBON MONOXIDE ALARM, 120V, WITH BATTERY BACKUP, INTERCONNECTABLE.
- S — LOCAL ONLY STROBE, 120V, WALL MOUNTED AT 80" A.F.F. TO CENTER, "C" INDICATES CEILING TYPE. UNLESS OTHERWISE NOTED, CANDELA RATING SHALL BE 177.

POWER:

- SURFACE MOUNTED PANELBOARD.
- FLUSH MOUNTED PANELBOARD.
- T — TRANSFORMER.
- ZHF — ZERO SEQUENCE HARMONIC FILTER.
- M — METER SOCKET, PROVIDE AS PER ELECTRIC UTILITY CO. STANDARDS, METER BY ELECTRIC UTILITY CO.
- OM — OWNER METER, REFER TO DRAWINGS FOR SPECIFICATION.
- SWBD — SWITCHBOARD.
- MDP — MAIN DISTRIBUTION PANELBOARD.
- CT — CURRENT TRANSFORMER CABINET AS PER ELECTRIC UTILITY CO. STANDARDS.
- OPERATION ROOM ISOLATION PANELBOARD.
- LIM — LINE ISOLATION MODULE.
- ATS — AUTOMATIC TRANSFER SWITCH.
- SPD — SURGE PROTECTION DEVICE.
- MCC — MOTOR CONTROL CENTER.
- MAGNETIC MOTOR STARTER, "H" INDICATES PROVIDED WITH HVAC EQUIPMENT BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- FUSED DISCONNECT SWITCH, "WP" INDICATES WEATHERPROOF, "H" INDICATES PROVIDED WITH HVAC EQUIPMENT BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- NON-FUSED DISCONNECT SWITCH, "WP" INDICATES WEATHERPROOF, "H" INDICATES PROVIDED WITH HVAC EQUIPMENT BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- THERMAL OVERLOAD TOGGLE SWITCH.
- 1 — MOTOR, NUMERAL INDICATES HORSEPOWER.
- G — GENERATOR.
- RGAP — REMOTE GENERATOR ANNUNCIATOR PANEL.
- EB — ENCLOSED CIRCUIT BREAKER.
- SECB — SECONDARY ENCLOSED CIRCUIT BREAKER.
- PECB — PRIMARY ENCLOSED CIRCUIT BREAKER.
- VFD — VARIABLE FREQUENCY DRIVE, PROVIDED BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- ATC — AUTOMATIC TEMPERATURE CONTROL PANEL, PROVIDED BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- C — CONTACTOR.
- MD — MOTORIZED DAMPER, PROVIDED BY HVAC SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- T — THERMOSTAT FOR ELECTRIC BASEBOARD HEAT.
- ELECTRIC BASEBOARD HEAT.
- UB — UTILITY CONTROL BOX, PROVIDED BY PLUMBING SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR SHALL WIRE PUSHBUTTON IN CONTROL UTILITY BOX SO THAT WHEN BUTTON IS PUSHED STUDENT STATION RECEPTACLE (GFCI) CIRCUITS SHALL BE SHUNT TRIPPED.
- URP — UTILITY CONTROL RELAY PANEL, FURNISHED BY PLUMBING SUBCONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR.
- SBa — BOILER EMERGENCY SHUTOFF SWITCH, RED COVER PLATE, ENGRAVED WITH "BOILER EMERGENCY SHUTOFF SWITCH." LOWER CASE LETTER INDICATES BOILER CONTROL.
- SWHa — WATER HEATER EMERGENCY SHUTOFF SWITCH, RED COVER PLATE, ENGRAVED WITH "WATER HEATER EMERGENCY SHUTOFF SWITCH." LOWER CASE LETTER INDICATES WATER HEATER CONTROL.
- EMERGENCY SHUTOFF MUSHROOM BUTTON, FOR CONNECTION TO SHUNT TRIP CIRCUIT BREAKER. PROVIDE 1"C. WITH WIRING AS REQUIRED FROM BUTTON TO CIRCUIT BREAKER. LABEL BUTTON AS "POWER EMERGENCY SHUTOFF."
- EMERGENCY SHUTOFF MUSHROOM BUTTON, FOR CONNECTION TO UPS, PROVIDE 1"C. WITH WIRING AS REQUIRED FROM BUTTON TO UPS. LABEL BUTTON AS "UPS EMERGENCY SHUTOFF SWITCH."
- SP — SUMP PUMP, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- PADDLE FAN.
- PFa — PADDLE FAN CONTROLLER, LOWER CASE LETTER INDICATES PADDLE FAN CONTROL.
- WH — WATER HEATER, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- BCB — BLEACHER CONTROL BOX, FURNISHED WITH BLEACHERS, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO BLEACHERS, VIA 1"C.
- BKS — BLEACHER KEY SWITCH, FURNISHED WITH BLEACHERS, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO BLEACHERS, VIA 1"C., SUBSCRIPT INDICATES BLEACHER CONTROL.
- RWS — RECYCLED WATER SYSTEM CONTROL PANEL, PROVIDED BY PLUMBING SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CIRCUIT TO CONTROL PANEL, PLUMBING SUBCONTRACTOR SHALL PROVIDE CONDUIT AND WIRING TO RECYCLED WATER SYSTEM AS REQUIRED.
- DYE — DYE ULTRAVIOLET SYSTEM CONTROL PANEL, PROVIDED BY PLUMBING SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CIRCUIT TO CONTROL PANEL, PLUMBING SUBCONTRACTOR SHALL PROVIDE CONDUIT AND WIRING TO DYE ULTRAVIOLET SYSTEM AS REQUIRED.
- GICP — GREASE INTERCEPTOR CONTROL PANEL, PROVIDED BY PLUMBING SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CIRCUIT TO CONTROL PANEL, PLUMBING SUBCONTRACTOR SHALL PROVIDE CONDUIT AND WIRING TO GREASE INTERCEPTOR SYSTEM AS REQUIRED.
- OW — OPERABLE WALL, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- OWC — OPERABLE WALL CONTROLLER, FURNISHED WITH OPERABLE WALL, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO OPERABLE WALL, VIA 1"C., SUBSCRIPT INDICATES OPERABLE WALL CONTROL.
- BC — DROP DOWN BATTING CAGE, PROVIDED BY GENERAL CONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE JUNCTION FOR SPECIAL PURPOSE RECEPTACLE AS REQUIRED BY MANUFACTURER.
- BCC — DROP DOWN BATTING CAGE CONTROLLER, FURNISHED WITH BATTING CAGE, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO DROP DOWN BATTING CAGE, VIA 1"C., SUBSCRIPT INDICATES DROP DOWN BATTING CAGE CONTROL.
- BW — BASKETBALL BACKSTOP WINCH, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- BBS — BASKETBALL BACKSTOP WINCH KEY SWITCH, FURNISHED WITH WINCH, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO BASKETBALL BACKSTOP WINCH, VIA 1"C., SUBSCRIPT INDICATES BASKETBALL BACKSTOP WINCH CONTROL.
- BH — BASKETBALL BACKSTOP HEIGHT ADJUSTER, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- BBH — BASKETBALL BACKSTOP HEIGHT ADJUSTER KEY SWITCH, FURNISHED WITH BACKSTOP HEIGHT ADJUSTER, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO BACKSTOP HEIGHT ADJUSTER, VIA 1"C., SUBSCRIPT INDICATES BACKSTOP HEIGHT ADJUSTER CONTROL.
- WS — MOTORIZED WINDOW SHADE, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR TO PROVIDE ALL POWER AND CONTROL WIRING FOR COMPLETE AND OPERATIONAL SYSTEM. ELECTRICAL SUBCONTRACTOR TO ASSUME THAT THE MOTOR WILL COME WITH A 6' LONG WHIP FROM GENERAL CONTRACTOR TO CONNECT TO JUNCTION BOX PROVIDED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR TO PROVIDE ALL WIRING FROM JUNCTION BOX TO SHADE CONTROLLERS PROVIDED BY GENERAL CONTRACTOR; INSTALLED BY ELECTRICAL SUBCONTRACTOR. JUNCTION BOX LOCATION TO BE COORDINATED IN THE FIELD BETWEEN ARCHITECT, SHADE INSTALLER AND ELECTRICAL SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR TO ASSUME THAT ONE SHADE CONTROLLER WILL CONTROL UP TO FOUR SHADES. IF WINDOWS HAVE DOUBLE SHADES TWO CONTROLLERS WILL BE PROVIDED. ONE CONTROLLER TO OPERATE UP TO FOUR LIGHT FILTERING SHADES AND ONE CONTROLLER TO CONTROL UP TO FOUR BLACK OUT SHADES.
- WSC — WINDOW SHADE CONTROLLER, FURNISHED WITH OPERABLE WINDOW SHADE, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO WINDOW SHADE, VIA 1"C., SUBSCRIPT INDICATES WINDOW SHADE CONTROL.
- CD — CURTAIN DIVIDER, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- CDC — CURTAIN DIVIDER CONTROLLER, FURNISHED WITH CURTAIN DIVIDER, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO CURTAIN DIVIDER, VIA 1"C., SUBSCRIPT INDICATES CURTAIN DIVIDER CONTROL.
- OH — OVERHEAD DOOR, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- OHC — OVERHEAD DOOR CONTROLLER, FURNISHED WITH OVERHEAD DOOR, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO OVERHEAD DOOR, VIA 1"C., SUBSCRIPT INDICATES OVERHEAD DOOR CONTROL.
- PS — PROJECTION SCREEN, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- PSC — PROJECTION SCREEN CONTROLLER, FURNISHED WITH PROJECTION SCREEN, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO PROJECTION SCREEN, VIA 1"C., SUBSCRIPT INDICATES PROJECTION SCREEN CONTROL.
- HS — HOIST, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- HSC — HOIST CONTROLLER, FURNISHED WITH HOISTS, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO HOISTS AND REMOTE E-STOP STATIONS, VIA 1"C., AND POWER WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO HOISTS, VIA 1"C., SUBSCRIPT INDICATES HOIST CONTROL.
- MH — MAT HOIST, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- MHC — MAT HOIST CONTROLLER, FURNISHED WITH HOISTS, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO MAT HOIST, VIA 1"C., SUBSCRIPT INDICATES MAT HOIST CONTROL.
- CG — COILING GATE, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- CGC — COILING GATE CONTROLLER, FURNISHED COILING GATE, INSTALLED AND WIRED BY ELECTRICAL SUBCONTRACTOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO COILING GATE, VIA 1"C, SUBSCRIPT INDICATES COILING GATE CONTROL.
- SC — SCOREBOARD, PROVIDE DUPLEX RECEPTACLE ADJACENT TO SCOREBOARD.
- ST — SHOT TIMER, PROVIDE DUPLEX RECEPTACLE ADJACENT TO SHOT TIMER.
- SR — SCOREBOARD/SHOT TIMER CONTROL RECEPTACLE BOX.
- DESTRATIFICATION FAN, CONTROLLED VIA SOLID STATE CONTROLLER.
- DFC — DESTRATIFICATION FAN SOLID STATE CONTROLLER, PROVIDE CONTROL WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO DESTRATIFICATION FAN, VIA 1"C., SUBSCRIPT INDICATES DESTRATIFICATION FAN CONTROL.
- SV — SOLENOID VALVE, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- A — AQUASTAT, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- RP — RE-CIRC PUMP, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- PB — PULL BOX.
- SJ — SECURITY SYSTEM JUNCTION BOX POWER IN IDF AND MDF ROOMS, CONNECT ALL SECURITY EQUIPMENT IN THE ROOM TO THIS CIRCUIT, REFER TO TECHNOLOGY DRAWINGS AND SPECIFICATIONS FOR REQUIREMENTS.
- J — JUNCTION BOX.
- B — JUNCTION BOX WITH BLANK PLATE.
- HT — HEAT TRACE CIRCUIT.
- DP — POWERED DOOR CONTROLLER, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- AD — AUTOMATIC POWERED DOOR, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- DR — ELECTROMECHANICAL FIRE ALARM/MASS NOTIFICATION DOOR HOLDER/CLOSER CIRCUIT.
- P — PUSH PLATE, PROVIDED BY GENERAL CONTRACTOR FOR AUTOMATIC POWERED DOOR, ELECTRICAL SUBCONTRACTOR SHALL PROVIDE WIRING AS PER MANUFACTURER'S SPECIFICATIONS TO POWERED DOOR CONTROLLER, VIA 1"C.
- WC — ELECTRIC WATER COOLER/FOUNTAIN, PROVIDED BY PLUMBING SUBCONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- HD — ELECTRIC HAND DRYER, PROVIDED BY GENERAL CONTRACTOR, WIRED BY ELECTRICAL SUBCONTRACTOR.
- RH — RANGE HOOD, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- CT — COOKTOP, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- WO — WALL OVEN, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- DW — DISHWASHER, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- GF — GAS FIREPLACE, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- GD — GARBAGE DISPOSAL, PROVIDED BY OTHERS, WIRED BY ELECTRICAL SUBCONTRACTOR.
- VCS — PEDESTAL (BOLLARD) MOUNTED, SINGLE, NETWORKED ELECTRIC VEHICLE CHARGING STATION, WITH INTEGRAL GATEWAY MODEM, POWER MANAGEMENT KIT, BOLLARD CONCRETE MOUNTING KIT, WARRANTY, AND STATION INITIAL ACTIVATION, CHARGE POINT #CT4011-GW1-CT4000PMGMT- CT4001CCM-CT4000ASSURE-CPSUPPORTACTIVE, OR EQUAL. REFER TO ELECTRIC VEHICLE CHARGING STATION DETAIL.
- VCS2 — PEDESTAL (BOLLARD) MOUNTED, DUAL, NETWORKED ELECTRIC VEHICLE CHARGING STATION, WITH INTEGRAL GATEWAY MODEM, POWER MANAGEMENT KIT, BOLLARD CONCRETE MOUNTING KIT, WARRANTY, AND STATION INITIAL ACTIVATION, CHARGE POINT #CT4021-GW1-CT4000PMGMT- CT4001CCM-CT4000ASSURE-CPSUPPORTACTIVE, OR EQUAL. REFER TO DUAL ELECTRIC VEHICLE CHARGING STATION DETAIL.

SITE:

- PE — PRIMARY ELECTRIC MANHOLE TO MEET ELECTRIC UTILITY CO. STANDARDS.
- LM — LOW VOLTAGE MANHOLE TO MEET SERVICE PROVIDER STANDARDS.
- LH — LOW VOLTAGE HANDHOLE TO MEET SERVICE PROVIDER STANDARDS.
- PH — POWER HANDHOLE TO MEET SERVICE PROVIDER STANDARDS.
- HH — 24" X 24" X 24" 5,000 PSI MINIMUM AFTER 28 DAYS, CONCRETE UNDERGROUND HANDHOLE, WITH 4"X10" OPENING IN EACH WALL, EQUAL TO SHEA CONCRETE PRODUCTS #HH-22-24.
- UTILITY POLE, PROVIDED BY SERVICE PROVIDER.
- —UPSTCFA— UNDERGROUND SERVICES, "U" INDICATES UNDERGROUND, "P"INDICATES PRIMARY ELECTRIC SERVICE, "S" INDICATES SECONDARY ELECTRIC SERVICE, "T" INDICATES TELEPHONE SERVICE, "C" INDICATES CABLE TV SERVICE, "FA" INDICATES FIRE ALARM SERVICE.
- —OPSTCFA— OVERHEAD SERVICES, "O" INDICATES OVERHEAD, "P" INDICATES PRIMARY ELECTRIC SERVICE, "S" INDICATES SECONDARY ELECTRIC SERVICE, "T" INDICATES TELEPHONE SERVICE, "C" INDICATES CABLE TV SERVICE, "FA" INDICATES FIRE ALARM SERVICE.
- —UGE— UNDERGROUND GENERATOR FEEDERS AND ACCESSORIES.

MISCELLANEOUS:

- —2— SLEEVE THU WALL, NUMBER INDICATES SIZE IN INCHES.
- —CT— CABLE TRAY.
- a — LOW VOLTAGE WEATHERPROOF PUSHBUTTON, EDWARDS #852, OR EQUAL, MOUNTED AT 48" A.F.F TO CENTER. SUBSCRIPT INDICATES BUZZER CONTROL.
- BZ a — LOW VOLTAGE BUZZER, EDWARDS #725, OR EQUAL. SUBSCRIPT INDICATES PUSHBUTTON CONTROL.
- TB — TRANSFORMER FOR LOW VOLTAGE BUZZER AND WEATHERPROOF PUSHBUTTON, EDWARDS #592, OR EQUAL. PROVIDE 120V CIRCUIT FROM NEAREST RECEPTACLE. INTERCONNECT TO LOW VOLTAGE BUZZERS AND LOW VOLTAGE WEATHERPROOF PUSHBUTTON AS REQUIRED.

MECHANICAL EQUIPMENT (REQUIRING POWER CONNECTION):

- EF — EXHAUST FAN
- P — PUMP
- CUH — CABINET UNIT HEATER
- HUH — HORIZONTAL UNIT HEATER
- RTU — ROOF TOP UNIT
- B — BOILER
- EUH — ELECTRIC UNIT HEATER
- ECUH — ELECTRIC CABINET UNIT HEATER
- CH — CHILLER
- CT — COOLING TOWER
- VFD — VARIABLE FREQUENCY DRIVE
- DFC — DUCTLESS FAN COIL
- CU — CONDENSING UNIT
- ERU — ENERGY RECOVERY UNIT
- MAU — MAKE-UP AIR UNIT
- AHU — AIR HANDLING UNIT
- FC — FAN COIL UNIT
- TB — TERMINAL BOX

PUBLIC SAFETY SIGNAL BOOSTER SYSTEM:

- BDA — WALL MOUNTED BIDIRECTIONAL AMPLIFIER.
- BDM — WALL MOUNTED BIDIRECTIONAL AMPLIFIER STATUS MONITORING PANEL.
- Y — DIRECTIONAL YAGI ANTENNA.
- —BDA— BIDIRECTIONAL AMPLIFIER CABLE AND ANTENNAS.

EXISTING ELECTRICAL LEGEND:

- EXISTING ELECTRICAL EQUIPMENT WITHOUT A DESIGNATION IS TO REMAIN.
- X — "X" INDICATES EXISTING ELECTRICAL EQUIPMENT WHICH IS TO BE REMOVED. PULL BACK WIRING AND CONDUIT BACK TO NEXT ACTIVE OUTLET OR POWER SOURCE.
- R — "R" INDICATES EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED AND RELOCATED. EXISTING CIRCUIT SHALL BE EXTENDED TO NEW LOCATION OF RELOCATED EXISTING ELECTRICAL EQUIPMENT.
- N — "N" INDICATES NEW LOCATION OF RELOCATED EXISTING ELECTRICAL EQUIPMENT.
- D — "D" INDICATES EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED. EXISTING CIRCUIT/WIRING AND BACK BOX SHALL REMAIN. NEW DEVICE SHALL BE LOCATED IN PLACE, EXTEND CIRCUIT/WIRING TO NEW ELECTRICAL EQUIPMENT.

NOTES:
1. DOTTED SYMBOLS INDICATE EXISTING ELECTRICAL EQUIPMENT.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. ELECTRICAL SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE CONTINUITY OF ALL EXISTING CIRCUITS WHICH ARE REMAINING.
4. ELECTRICAL SUBCONTRACTOR SHALL DISCONNECT AND REMOVE ALL ELECTRICAL EQUIPMENT, WIRING, CONDUIT, ETC. ASSOCIATED WITH EXISTING MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT SCHEDULED TO BE REMOVED. REFER TO DRAWINGS FOR LOCATIONS OF EQUIPMENT.

LIGHTING FIXTURE TYPE, REFER TO LIGHTING FIXTURE SCHEDULE — A
LIGHTING FIXTURE
INDICATES CIRCUIT NUMBER
LA,3b
INDICATES PANEL FROM WHERE BRANCH CIRCUIT ORIGINATES
INDICATES SWITCH CONTROL

LIGHTING NOTES:
1. THIS KEY APPLIES TO ALL LIGHTING FIXTURES, EXIT SIGNS, EMERGENCY BATTERY UNITS, ETC.

ELECTRICAL DEVICE
INDICATES CIRCUIT NUMBER
LA,3
INDICATES PANEL FROM WHERE BRANCH CIRCUIT ORIGINATES

POWER NOTES:
1. THIS KEY APPLIES TO ALL RECEPTACLES, JUNCTION BOXES, DISCONNECT SWITCHES, THERMAL SWITCHES, ETC.

GENERAL NOTES:
1. WIRING (MC, NM, FAMC, THHN, ETC.) AND CONDUIT SHALL BE REQUIRED BETWEEN ALL LIGHTING FIXTURES, RECEPTACLES, OUTLETS, ETC. INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS. REFER TO SPECIFICATIONS FOR APPLICABLE MEANS AND METHODS.
2. ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.
3. WIRING SHALL BE 2#12+#12G-1/2"C MINIMUM.

CIRCUITING KEY
N.T.S.

LC INDICATES "LIGHTING CONTROL DETAIL"
LC 1
NUMBER REFERS TO LIGHTING CONTROL DETAIL TO BE REFERENCED, TYPICAL.

GENERAL NOTE:
1. THIS TAG INDICATES CONTROL REQUIREMENTS. REFER TO LIGHTING CONTROL DETAIL DRAWINGS FOR DETAIL ASSOCIATED WITH THE ROOM.

LIGHTING CONTROL KEY
N.T.S.

NURSE CALL:

NOTE:
ELECTRICAL SUBCONTRACTOR TO COORDINATE ALL BOX SIZES WITH EQUIPMENT VENDOR PRIOR TO PURCHASING.

- NT — NURSE CALL TERMINAL CABINET.
- NCA — NURSE CALL ANNUNCIATOR.
- E — NURSE CALL EMERGENCY CALL STATION (PUSH BUTTON) COORDINATE EXACT LOCATION WITH OWNER AND ARCHITECT.
- ES — NURSE CALL EMERGENCY CALL STATION (PULL CORD) COORDINATE EXACT LOCATION WITH OWNER AND ARCHITECT.
- D — DUTY STATION.
- A — NURSE CALL SINGLE PATIENT CALL STATION.
- S — NURSE CALL STAFF STATION.
- SA — NURSE CALL STAFF ASSIST STATION.
- C — NURSE CALL CODE STATION, "SA" INDICATES COMBINATION CODE STATION WITH STAFF ASSIST.
- M — NURSE CALL MASTER STATION, COORDINATE EXACT LOCATION WITH OWNER AND ARCHITECT.
- I — INTERCOM STATION, SLAVE STATION.
- IM — INTERCOM MASTER STATION.
- B — NURSE CALL SINGLE PATIENT STATION WITH PULL SWITCH.
- J — NURSE CALL MEDICAL MONITOR ALARM JACK.
- BR — NURSE CALL BED RECEPTACLE.
- BS — NURSE CALL BED STATUS STATION.
- PATIENT DOME LIGHT, CEILING MOUNTED, "T" INDICATES WITH TONE.
- ZONE DOME LIGHT, WITH BUZZER.
- PATIENT DOME LIGHT, WALL MOUNTED, "T" INDICATES WITH TONE.

SOUND SYSTEM:

EQUIPMENT DESIGNATIONS:
"L" INDICATES LOCAL SOUND SYSTEM, SEE SPECIFICATIONS.
"S" INDICATES SURFACE MOUNTED.
"WG" INDICATES WITH WIREGUARD.

- SP — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR RECESSED WALL MOUNTED SPEAKER.
- SP — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR RECESSED CEILING MOUNTED SPEAKER.
- SP — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR RECESSED WALL MOUNTED HORN SPEAKER.
- AMP — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR LOCAL ONLY SOUND SYSTEM AMPLIFIER.
- M — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR LOCAL SOUND SYSTEM MICROPHONE OUTLET.
- M — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR SOUND SYSTEM MICROPHONE OUTLET.
- V — BACK BOX (FURNISHED AND INSTALLED BY SYSTEM INTEGRATOR) WITH 1" C. TO SPACE ABOVE CORRIDOR CEILING (FURNISHED AND INSTALLED BY ELECTRICAL SUBCONTRACTOR) FOR RECESSED WALL MOUNTED VOLUME CONTROL.
- A/J — AUDIO INPUT JACK.
- A/B — AUDIO A/B SWITCH.

AREA OF REFUGE:

- AR — WALL MOUNTED AREA OF REFUGE CALL STATION. CONNECT TO MASTER PANEL WITH FIRE RESISTIVE CABLE. EQUAL TO RATH 2100.
- ARP — WALL MOUNTED AREA OF REFUGE BASE STATION/POWER SUPPLY/MODEM SYSTEM MASTER PANEL TO TRANSFER CALL TO 911 AFTER TIME INTERVAL DETERMINED BY IBC AND LOCAL FIRE DEPARTMENT. BASE STATION EQUAL TO RATH 2500 WITH 2100-GSMLC CELLULAR DEVICE, 2500-PWR24 POWER SUPPLY, AND RP6600300M 2 HOUR RATED CABLE, 2100-XXXSSRC2 4-HOUR BATTERY BACK UP.
- AR — (ADD-6) SINGLE FACE AREA OF RESCUE ASSISTANCE SIGN, WITH GREEN LETTERS ON WHITE BACKGROUND, BRUSHED ALUMINUM HOUSING, UNIVERSAL, FIELD CONVERTIBLE. ISOLITE TLCG2-AC-G-1-WH-BA-MTEB-CW26 OR EQUAL. CONNECT TO NEAREST UNSWITCHED EMERGENCY CIRCUIT.
- AR — DUAL FACE AREA OF RESCUE ASSISTANCE SIGN, WITH GREEN LETTERS ON WHITE BACKGROUND, BRUSHED ALUMINUM HOUSING, UNIVERSAL, FIELD CONVERTIBLE. ISOLITE TLCG2-AC-G-2-WH-BA-MTEB-CW26 OR EQUAL.CONNECT TO NEAREST UNSWITCHED EMERGENCY CIRCUIT.
- ARW — SINGLE FACE AREA OF RESCUE ASSISTANCE WEATHERPROOF SIGN WITH INTERNAL HEATER, WITH GREEN LETTERS ON WHITE BACKGROUND, POLYCARBONATE HOUSING, UNIVERSAL, FIELD CONVERTIBLE. ISOLITE MAX2.0-AC-G-1-WH-CW"AREA OF RESCUE ASSISTANCE", OR EQUAL. CONNECT TO NEAREST UNSWITCHED "EL" PANELBOARD LIGHTING CIRCUIT.

ONE LINE DIAGRAM:

EQUIPMENT DESIGNATIONS:
"AF" INDICATES AMPERE FRAME SIZE.
"AT" INDICATES AMPERE TRIP SETTINGS.

- SPLICE.
- RACEWAY BREAK SYMBOL, INDICATES CONTINUATION OF RACEWAY AND WIRING.
- RACEWAY CAP SYMBOL, INDICATES CAPPED AND SEALED RACEWAY.
- DELTA.
- WYE.
- THERMAL CIRCUIT OVERLOAD.
- CONTACT, NORMALLY OPEN.
- 30AF 30AS — CONTACT, NORMALLY CLOSED.
- CB — DRAW OUT MEDIUM VOLTAGE STARTER.
- 150KVA 120/208V — DRAW OUT MEDIUM VOLTAGE CIRCUIT BREAKER.
- CP — POWER TRANSFORMER, SIZE AS INDICATED.
- PT — CONTROL POWER TRANSFORMER.
- POTENTIAL TRANSFORMER.
- 30AF 30AS — CURRENT TRANSFORMER.
- MOLDED CASE CIRCUIT BREAKER.
- 400AF 400AT — FUSE.
- DRAW OUT CIRCUIT BREAKER.
- GF — GROUND FAULT SENSOR AND RELAY.
- AS
- AM — AMMETER SWITCH.
- VS — AMMETER.
- VM — VOLTMETER SWITCH.
- KWH — VOLTMETER.
- 400AS 300AF — KILOWATT-HOUR METER.
- HEAVY DUTY FUSIBLE SAFETY SWITCH, "400AS" INDICATES SWITCH RATING, "300AS" INDICATES FUSE RATING.
- SYSTEM GROUND OR EQUIPMENT GROUND.
- LIGHTNING ARRESTER AND GROUNDING.
- N E L — AUTOMATIC TRANSFER SWITCH.
- K — KIRK KEY.

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KEYNOTE LEGEND:

ADD-6	ADDENDUM 6	1/23/2024

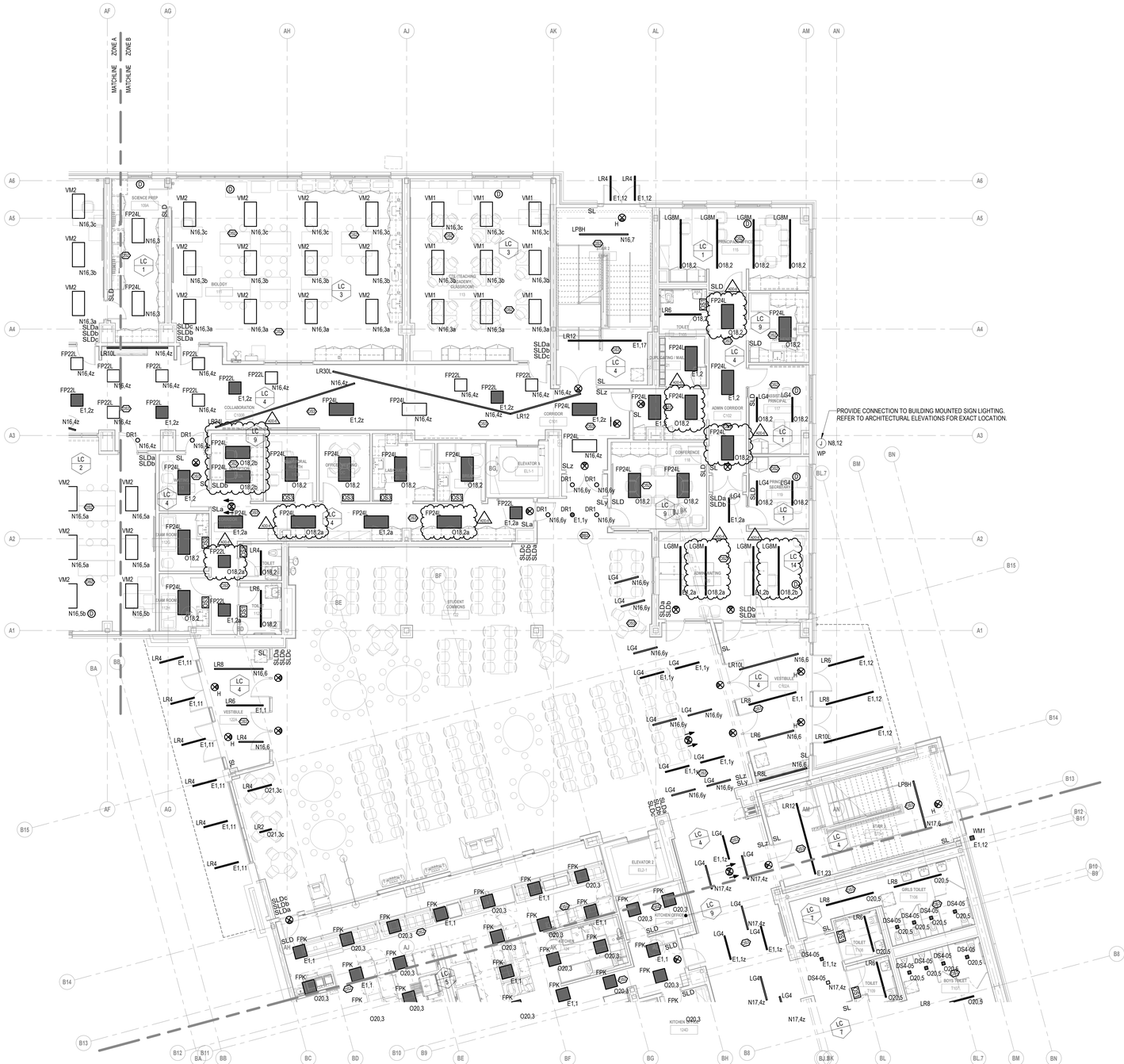
100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:
ELECTRICAL LEGEND

DRAWN BY: RBC
REVIEWED BY: RCB
SCALE: NONE
JOB NO.: 2202.00
DATE: OCTOBER 13, 2023
DRAWING NUMBER: E0.01



1 FIRST FLOOR LIGHTING PLAN - ZONE B
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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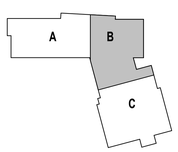
ADD-6	ADDENDUM 6	1/23/2024
ADD-3	ADDENDUM 3	1/9/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

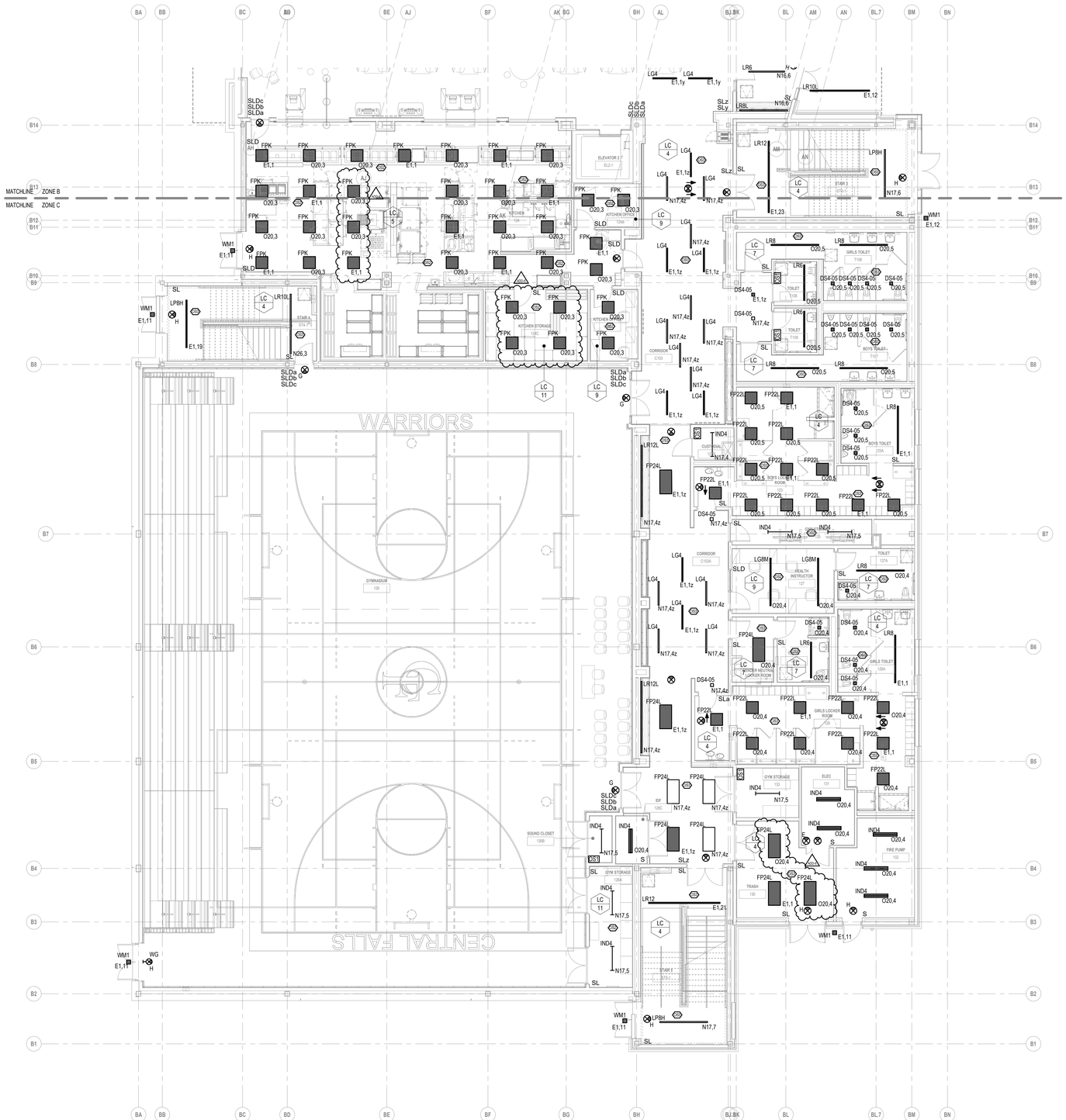


DRAWING NAME:

ELECTRICAL FIRST FLOOR LIGHTING PLAN - ZONE B

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: E1.11B



1 FIRST FLOOR LIGHTING PLAN - ZONE C
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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KEY PLAN NORTH ARROW

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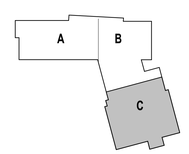
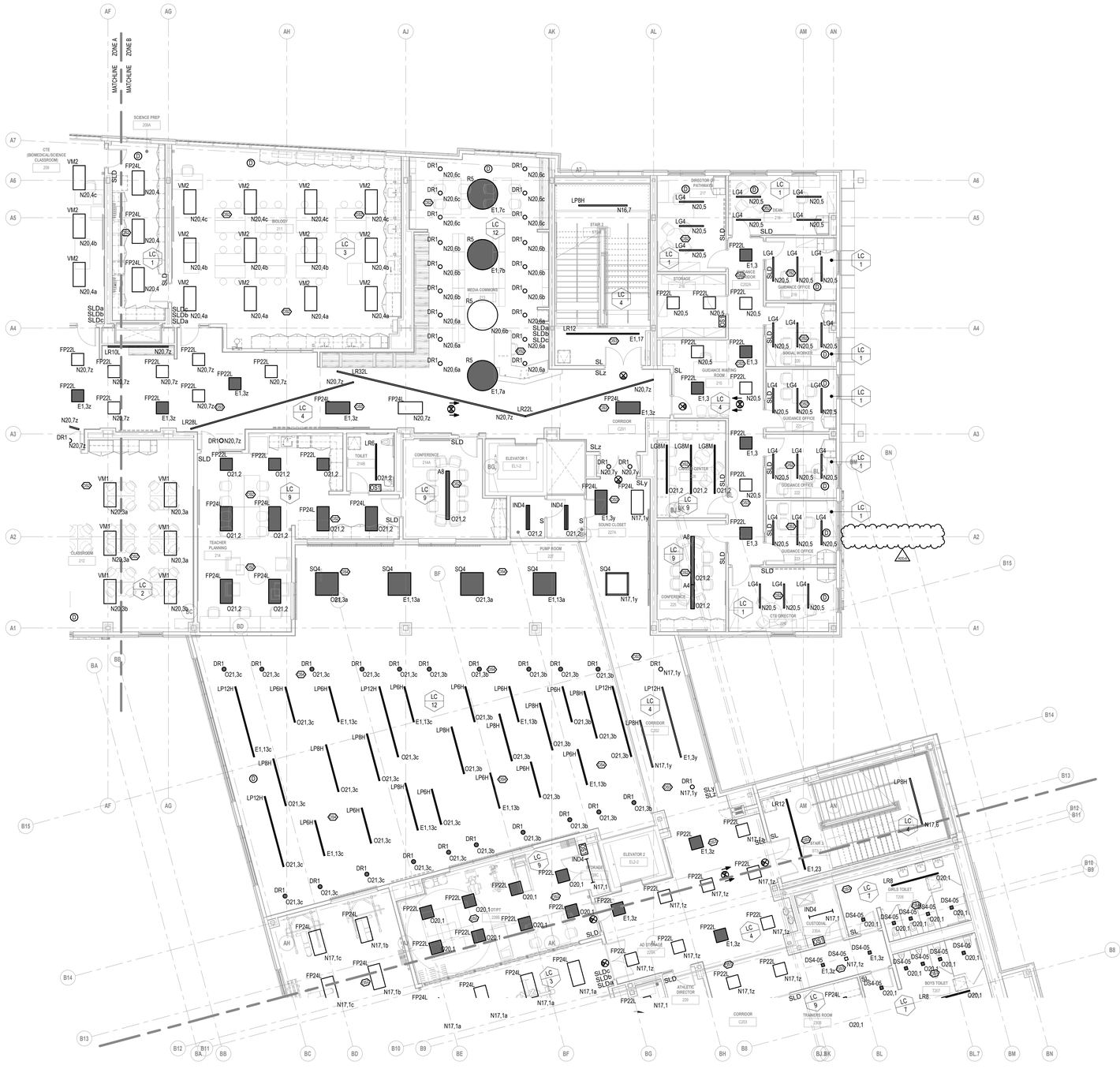


DRAWING NAME:

ELECTRICAL FIRST FLOOR LIGHTING PLAN - ZONE C

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: E1.11C



1 SECOND FLOOR LIGHTING PLAN - ZONE B
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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ADD-6	ADDENDUM 6	1/23/2024
ADD-3	ADDENDUM 3	1/9/2024

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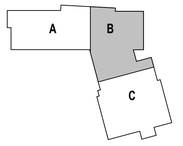
KEY PLAN NORTH ARROW

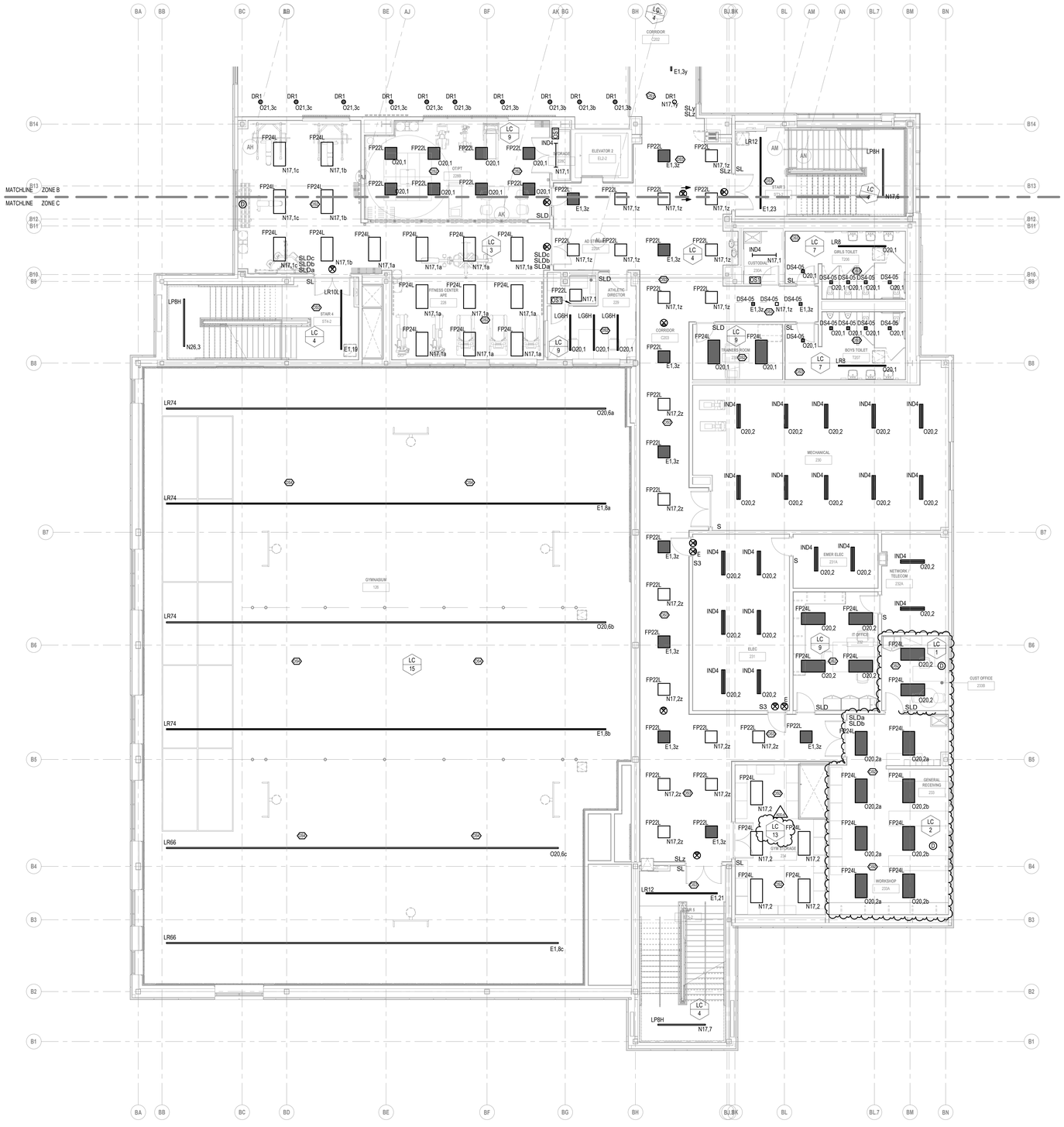
KEYPLAN



DRAWING NAME:

ELECTRICAL SECOND FLOOR LIGHTING PLAN - ZONE B

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	E1.12B



1 SECOND FLOOR LIGHTING PLAN - ZONE C
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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KEYNOTE LEGEND:

ADD-6	ADDENDUM 6	1/23/2024
ADD-3	ADDENDUM 3	1/9/2024

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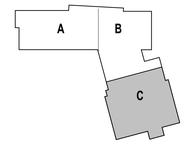
KEY PLAN NORTH ARROW

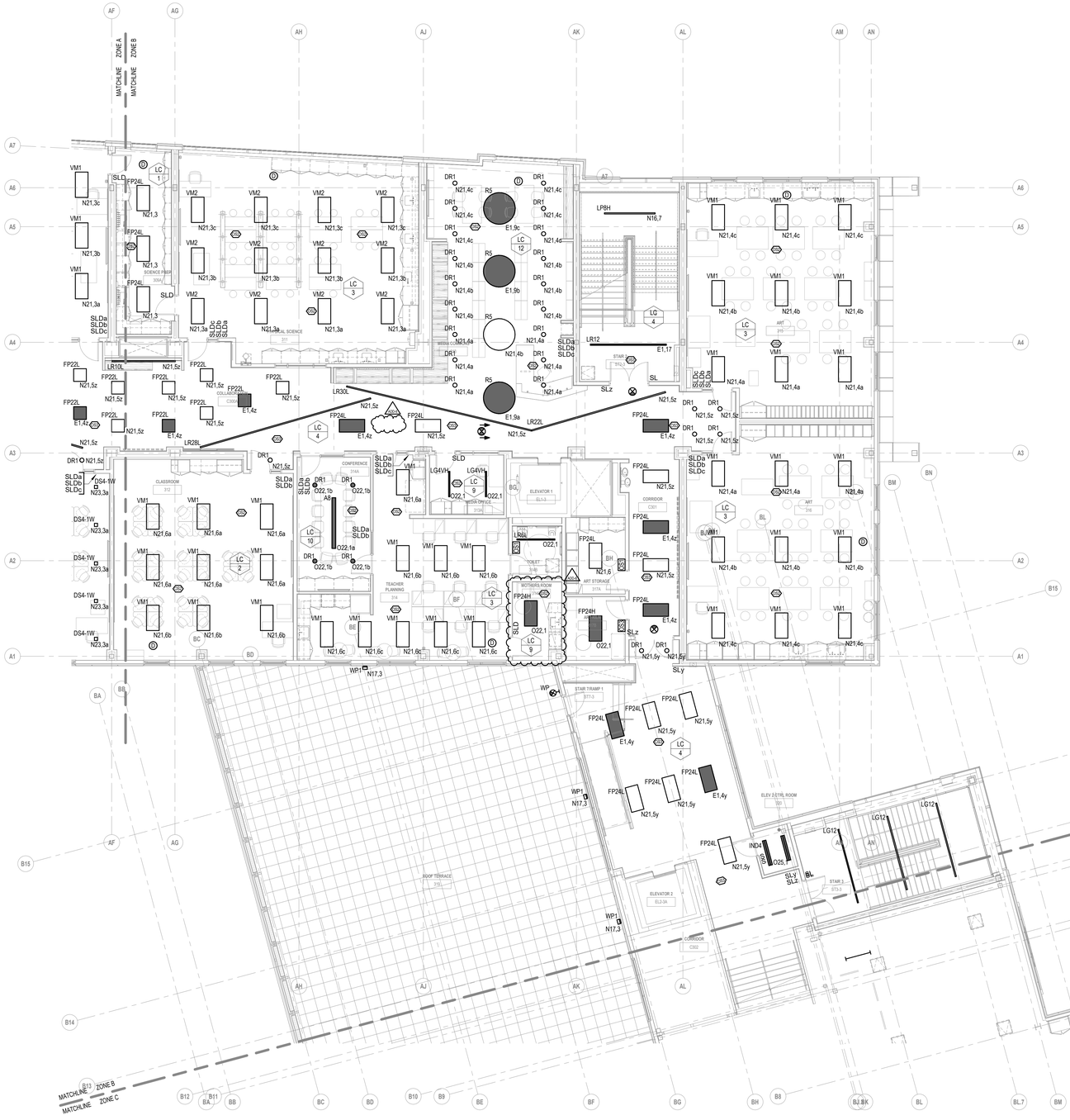
KEYPLAN



DRAWING NAME:

ELECTRICAL SECOND FLOOR LIGHTING PLAN - ZONE C

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	E1.12C



1 THIRD FLOOR LIGHTING PLAN - ZONE B
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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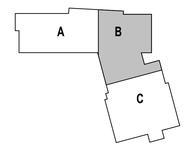
KEY PLAN NORTH ARROW

KEYPLAN



DRAWING NAME:

ELECTRICAL THIRD FLOOR LIGHTING PLAN - ZONE B

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: E1.13B

277Y/480V PANEL KEY SCHEDULE		
KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE		
KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

PROVIDE CONNECTION TO BUILDING MOUNTED SIGN LIGHTING. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION.

MATCHLINE ZONE B

MATCHLINE ZONE C

1 THIRD FLOOR LIGHTING PLAN - ZONE C
1/8" = 1'-0"

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CENTRAL FALLS HIGH SCHOOL
10 HIGGINSON AVE, CENTRAL FALLS, RI

KEYNOTE LEGEND:

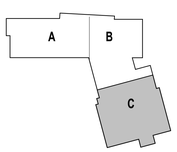
1 (2) TYPE LR4M LIGHTING FIXTURES INSTALLED VERTICALLY IN WALL. REFER TO ARCHITECTURAL DETAILS FOR PLACEMENT. CIRCUIT RP01,40

ADD-6	ADDENDUM 6	1/23/2024
ADD-3	ADDENDUM 3	1/9/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

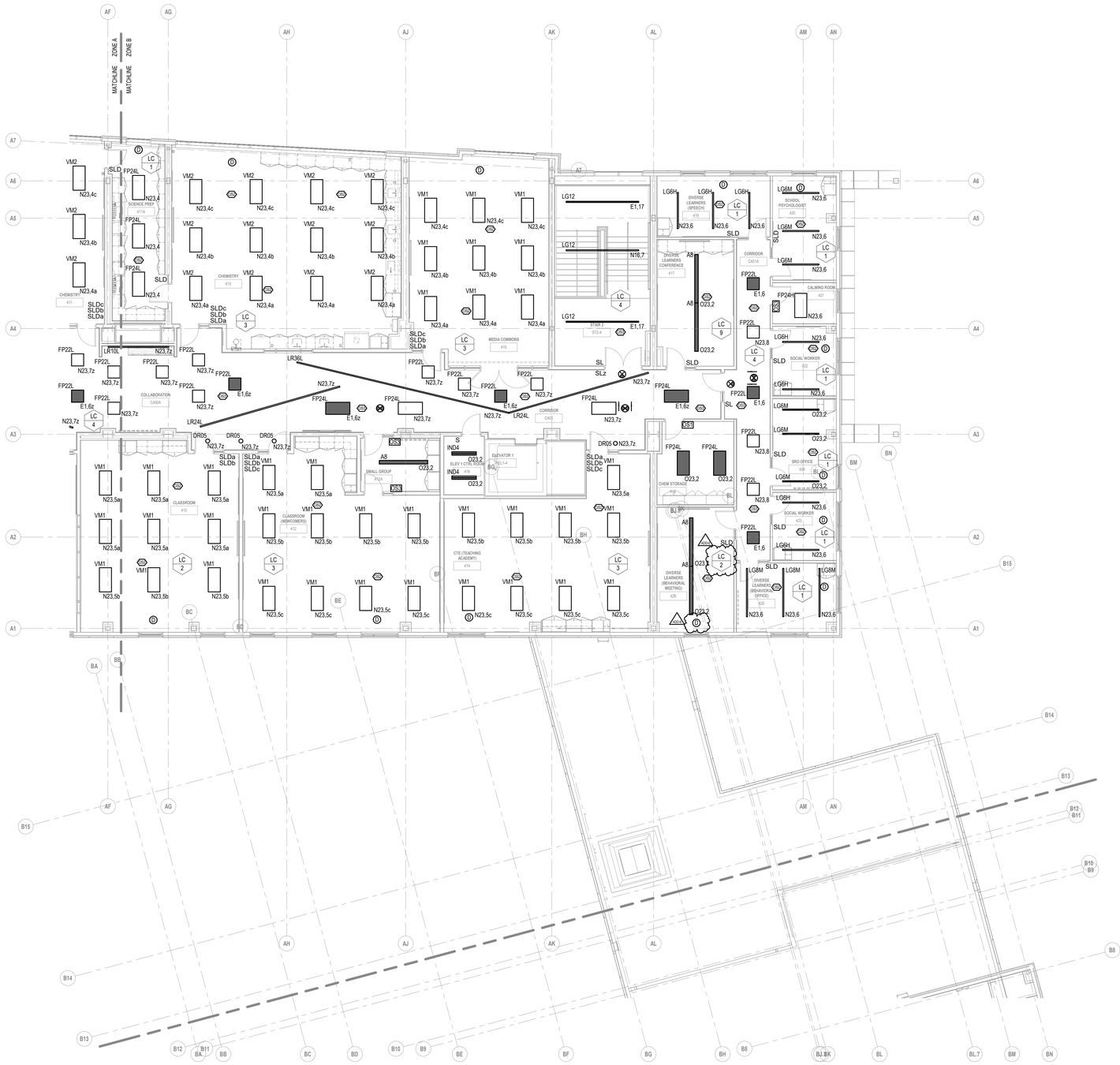
KEYPLAN



DRAWING NAME:

ELECTRICAL THIRD FLOOR LIGHTING PLAN - ZONE C

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
DRAWING NUMBER:	E1.13C



1 FOURTH FLOOR LIGHTING PLAN - ZONE B
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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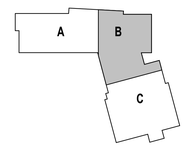
KEYNOTE LEGEND:

ADD-6	ADDENDUM 6	1/23/2024
ADD-3	ADDENDUM 3	1/9/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

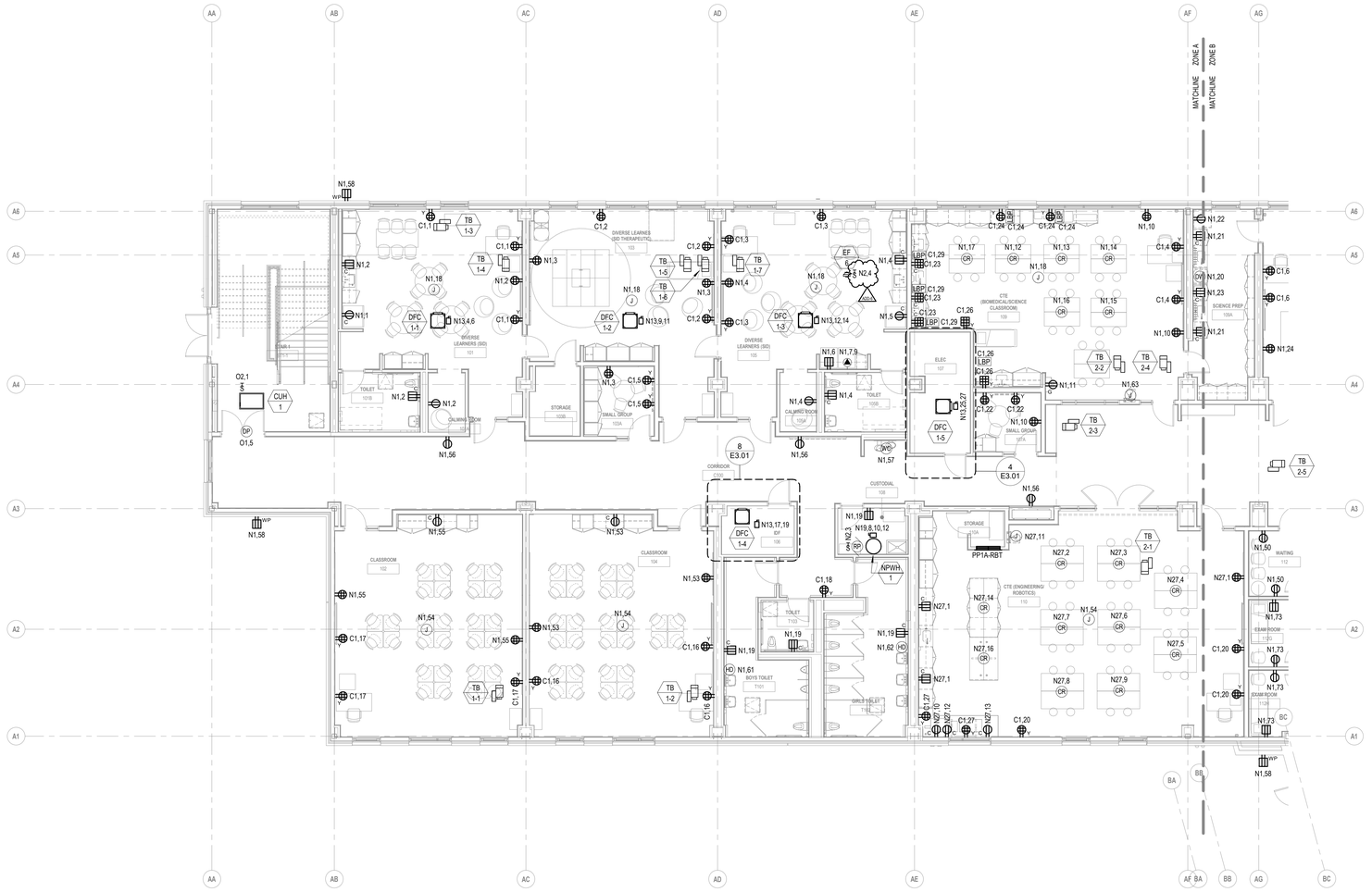
KEYPLAN



DRAWING NAME:
ELECTRICAL
FOURTH FLOOR
LIGHTING PLAN -
ZONE B

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER:
E1.14B



1 FIRST FLOOR POWER PLAN - ZONE A
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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GENERAL NOTES:

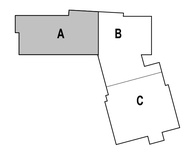
1. ELECTRICAL SUBCONTRACTOR SHALL WIRE ALL TERMINAL BOXES SHOWN ON THIS DRAWING TO N2.1.

ADD-6 ADDENDUM 6 1/23/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

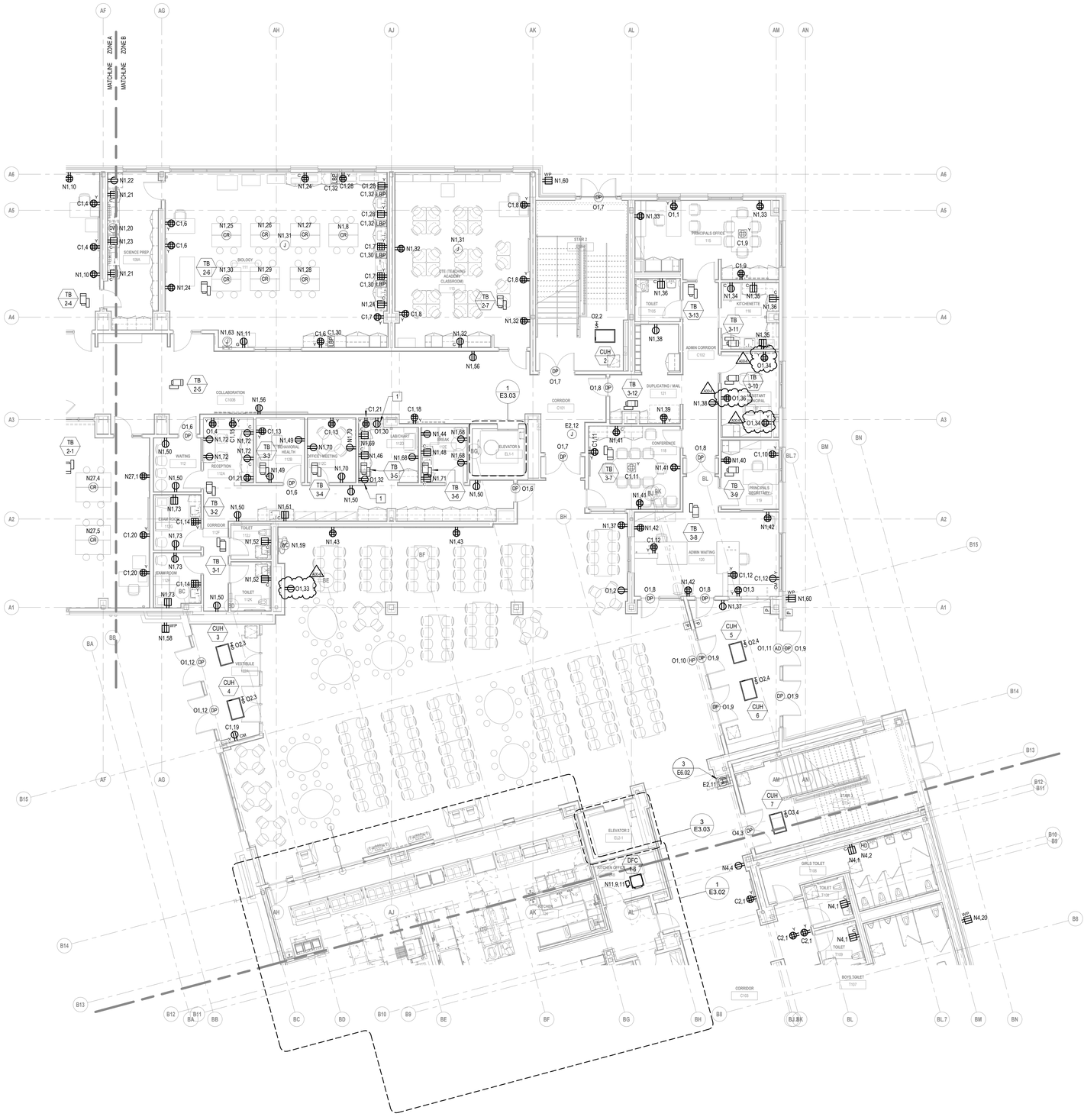


DRAWING NAME:

ELECTRICAL FIRST FLOOR POWER PLAN - ZONE A

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: **E2.11A**



1 FIRST FLOOR POWER PLAN - ZONE B
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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KEYNOTE LEGEND:

1 PROVIDE TAMPER-RESISTANT HOSPITAL GRADE TYPE RECEPTACLE AT THIS LOCATION.

GENERAL NOTES:

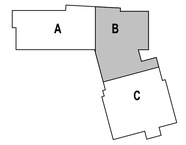
1. ELECTRICAL SUBCONTRACTOR SHALL WIRE ALL TERMINAL BOXES SHOWN ON THIS DRAWING TO N2.2.

ADD-6 ADDENDUM 6 1/23/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN

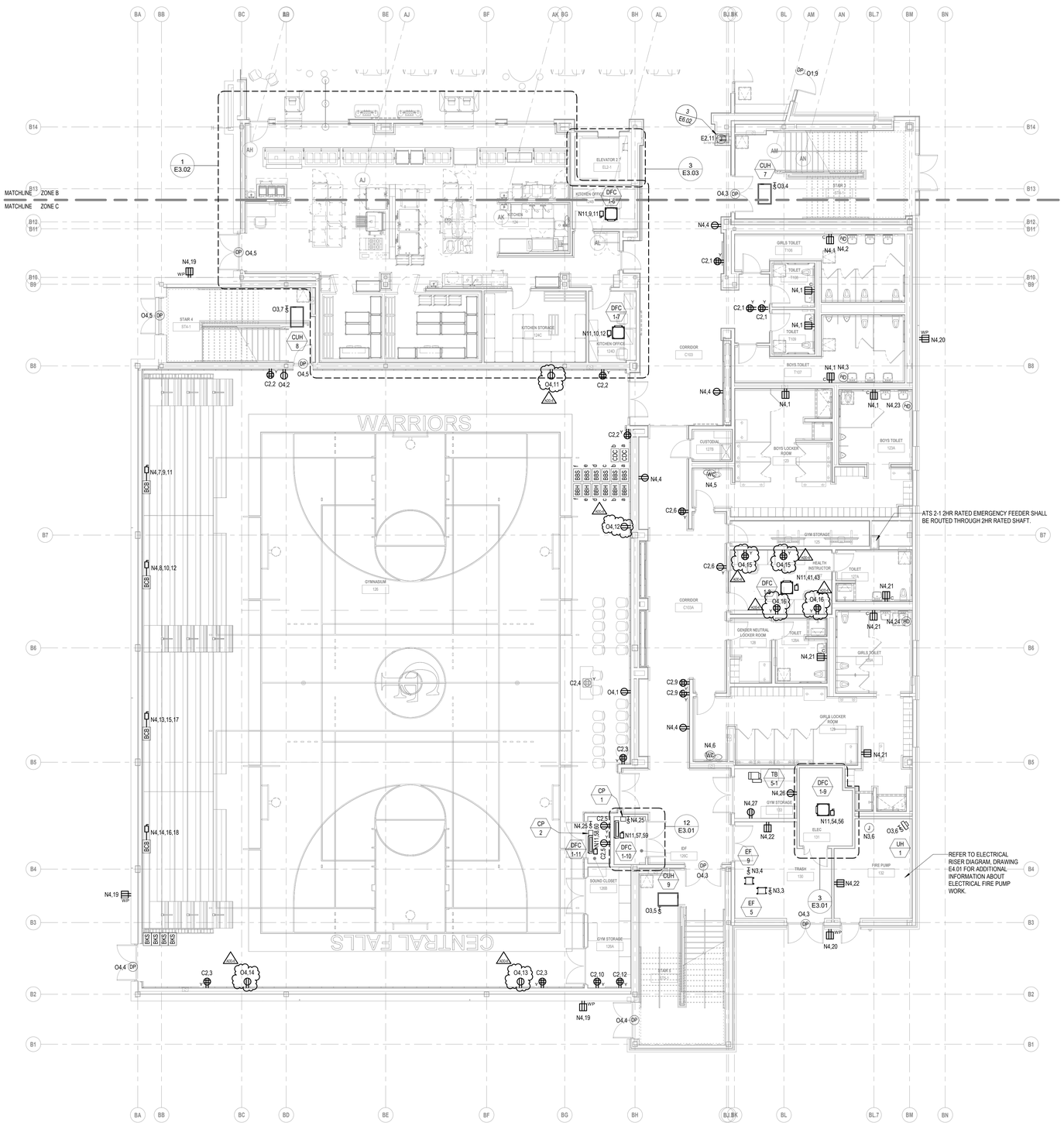


DRAWING NAME:

ELECTRICAL FIRST FLOOR POWER PLAN - ZONE B

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: E2.11B



1 FIRST FLOOR POWER PLAN - ZONE C
1/8" = 1'-0"

277Y/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	EL2-L	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP3A-L	NORMAL
N21	LP3A-L	NORMAL
N23	LP4A-L	NORMAL
N24	LP4A-M	NORMAL
N25	LP3C-M	NORMAL
N26	LP3C-L	NORMAL
O18	OL1A-L	OPTIONAL STANDBY
O19	OL2C-M	OPTIONAL STANDBY
O20	OL2C-L	OPTIONAL STANDBY
O21	OL2A-L	OPTIONAL STANDBY
O22	OL3A-L	OPTIONAL STANDBY
O23	OL4A-L	OPTIONAL STANDBY
O25	OL3C-L	OPTIONAL STANDBY

208Y/120V PANEL KEY SCHEDULE

KEY	PANEL NAME	BRANCH
E2	EP2-R	EMERGENCY
C1	CP1A	NORMAL
C2	CP1C	NORMAL
C4	CP2A	NORMAL
C5	CP2C	NORMAL
C6	CP3A	NORMAL
C7	CP3C	NORMAL
C8	CP4A	NORMAL
N1	PP1A-R	NORMAL
N2	PP1A-M	NORMAL
N3	PP1C-M	NORMAL
N4	PP1C-R	NORMAL
N5	PP2A-M	NORMAL
N6	PP2A-R	NORMAL
N7	PP2C-M	NORMAL
N8	PP2C-R	NORMAL
N10	PP3A-R	NORMAL
N11	PP3C-M	NORMAL
N12	PP3C-R	NORMAL
N13	PP4A-M	NORMAL
N14	PP4A-R	NORMAL
N15	KP1B	NORMAL
N27	PP1A-RBT	NORMAL
O1	OP1A-R	OPTIONAL STANDBY
O2	OP1A-M	OPTIONAL STANDBY
O3	OP1C-M	OPTIONAL STANDBY
O4	OP1C-R	OPTIONAL STANDBY
O6	OP2A-R	OPTIONAL STANDBY
O7	OP2C-M	OPTIONAL STANDBY
O8	OP2C-R	OPTIONAL STANDBY
O10	OP3A-R	OPTIONAL STANDBY
O11	OP3C-L	OPTIONAL STANDBY
O12	OP3C-M	OPTIONAL STANDBY
O13	OP3C-R	OPTIONAL STANDBY
O15	OP4A-R	OPTIONAL STANDBY
O16	OKP1B	OPTIONAL STANDBY
O17	OMDF	OPTIONAL STANDBY

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GENERAL NOTES:

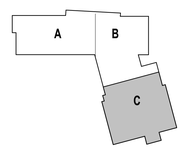
1. ELECTRICAL SUBCONTRACTOR SHALL WIRE ALL TERMINAL BOXES SHOWN ON THIS DRAWING TO N3.2.

ADD-6 ADDENDUM 6 1/23/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

KEYPLAN



DRAWING NAME:
ELECTRICAL FIRST FLOOR POWER PLAN - ZONE C

DRAWN BY:	RBC/JAJ
REVIEWED BY:	RCB
SCALE:	AS NOTED
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023

DRAWING NUMBER: E2.11C

TABLE OF CONTENTS

VOLUME 1 *(DIVISIONS 00 THROUGH 09)*

End - Table of Contents

Document 00 43 22

BID ATTACHMENT
UNIT PRICES FORM

A. Unit prices: Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those upon which the Bid is based, as authorized by the Owner, the undersigned agrees that the following supplemental unit prices represent the exact net amount per unit to be paid the Contractor (in the case of additions or increases) or credited to the Owner (in the case of decrease), without further adjustment for overhead, profit, insurance, compensation insurance or other direct or indirect expenses of the Contractor.

B. SCHEDULE OF UNIT PRICES:

Item	Spec. Section	Unit of Measure	Unit Cost	Bid Quantity	Bid Price
1. Removal of unanticipated Unsuitable Soils.	31 00 00	Cubic Yard (CY)	$……	1,000 CY	$……
2. Removal of unanticipated Petroleum Contaminated Soils.	31 00 00	Cubic Yard (CY)	$……	100 CY	$……
3. Excavation of open rock removal.	31 00 00	Cubic Yard (CY)	$……	100 CY	$……
4. Unit Price for additional installed aggregate piers.	31 60 00	Each	$……	ONE	$……
5. Unit Price Credit for aggregate piers.	31 60 00	Each	$……	ONE	$……
6. Unit Price for additional Modulus Tests.	31 60 00	Square foot	$……	ONE	$……
7. Credit per foot for difference between actual length and length of aggregate piers/rigid inclusions.	31 60 00	Linear foot (LF)	$……	100 LF	$……
8. Unit Price per foot difference between actual length and length of aggregate piers/rigid inclusions.	31 60 00	Linear foot (LF)	$……	100 LF	$……
9. Unit Price for additional Mobilizations.	31 60 00	Each	$……	ONE	$……

End of Document

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Section 00 43 93

BID SUBMITTAL CHECKLIST

1.1 GENERAL REQUIREMENTS

A. This Checklist is a guide to General Contract Bidders in the assembly of their bid submittal. Each Bidder shall include the following attachments. Bids submitted without **all** of the following items shall be considered incomplete and are subject to rejection.

1.2 BIDDERS CHECKLIST

A. All forms must be completed in full.

_____ Document 00 41 13 Bid Form

_____ Document 00 43 13 Bid Security, *AIA Form A310 -Bid Bond or suitable Bid Security furnished.*

_____ Document 00 43 22 Bid Attachment – Unit Prices Form [ADD #6]

_____ Document 00 43 23 Bid Attachment – Alternates Form

_____ Document 00 45 13 Contractor's Qualification Statement, AIA FORM A305 and qualification attachments as required by INSTRUCTIONS TO BIDDERS, and BIDDER'S QUALIFICATIONS AND EVALUATION.

_____ Bond Eligibility Notarized assurance of Bidder's bonding eligibility on surety company's own letterhead, in compliance with 220-RICR-30-00-4.6(D)(4)(d).

_____ Document 00 45 19 Non-Collusion Affidavit

_____ Document 00 45 39 DBE Special Provision Affidavit

_____ Document 00 45 43 Certificate of Authority to Sign Contract on Behalf of Corporation

_____ Document 00 45 44 Foreign Corporation Certification

_____ Document 00 45 47 Tax Compliance Certification, with attachment of Letter of Good Standing from the Rhode Island Department of Revenue - Division of Taxation.

_____ Document 00 45 49 Prompt Payment to Subcontractors Affidavit

End of Document

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Section 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. Measurement and payment criteria applicable to portions of the Work performed under a unit price payment method.

B. Non-payment for rejected unit price Work.

1.2 RELATED REQUIREMENTS

A. Section 31 00 00 – EARTHWORK: Measurement for Work requiring unit price payment.

B. Section 31 60 00 – GROUND IMPROVEMENTS.

1.3 AUTHORITY

A. Measurement methods delineated in the individual specification sections are intended to complement the criteria of this Section. In the event of conflict, the requirements of the individual specification section shall govern.

B. Take all measurements and compute quantities. The Architect will verify measurements and quantities.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

1.4 UNIT QUANTITIES SPECIFIED

A. Quantities and measurements indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Owner shall determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

1.5 MEASUREMENT OF QUANTITIES

A. Measurement devices:

1. Weigh scales: Inspected, tested and certified by applicable weights and measures department within the past year.
2. Platform scales: Of sufficient size and capacity to accommodate the conveying vehicle.
3. Metering devices: Inspected, tested and certified by applicable department within the past year.

B. Measurement by weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

C. Measurement by volume: Measured by cubic dimension using mean length, width and height or thickness.

D. Measurement by area: Measured by square dimension using mean length and width or radius.

E. Linear measurement: Measured by linear dimension, at the item centerline or mean chord.

F. Stipulated sum/price measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

1.6 PAYMENT

A. Payment includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Architect multiplied by the unit sum/price for Work which is incorporated in or made necessary by the Work.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:
1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling and disposing of rejected Products.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULES

A. Unit Price Schedule, refer to Document 00 43 22 - BID ATTACHMENT – UNIT PRICES FORM.

End of Section

Section 07 21 00
THERMAL INSULATION

PART 1 – GENERAL

1.1 SUMMARY

A. Furnish and Install:
1. Rigid insulation beneath interior concrete slabs.
2. Rigid insulation at perimeter foundation walls.
3. Rigid insulation at exterior wall cavities.
4. Thermal batt insulation between framing.
5. Perimeter fire containment insulation at curtainwall systems.
6. Low pressure, low expansion polyurethane foamed-in-place insulation / air barrier sealant: applied to seal gaps, cracks, cavities and joints in the building envelope, at door frames, perimeter of window frames, and other similar penetrations in exterior walls.

1.2 RELATED REQUIREMENTS

A. Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL: Procedural and administrative requirements relating to recycling goals, waste management program and reporting.

B. Section 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS: Procedural and administrative requirements relating to required *Northeast CHPS Verified Program,* (NE-CHPS) Certification.

C. Section 06 10 00 - ROUGH CARPENTRY: Wood blocking, nailers.

D. Section 07 27 13 – MODIFIED BITUMINOUS SHEET AIR BARRIERS.

E. Section 07 54 19 - POLYVINYL CHLORIDE (PVC) ROOFING: roof insulation.

F. Section 09 81 00 - ACOUSTICAL INSULATION: Acoustical batt insulation between framing members.

G. Section 09 29 00 - GYPSUM BOARD: Installation of wall board over insulation in Z-channel furring system.

H. Division 23 - HEATING, VENTILATING AND AIR CONDITIONING: Ductwork and piping insulation.

1.3 REFERENCES

A. Referenced Standards: Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES. The standards referenced herein are included to establish recognized minimum quality only. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern. Equivalent quality and testing standards will be acceptable, subject to their timely submission, review and acceptance by the Architect.

1. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
2. ASTM C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block Type-Thermal Insulation.
3. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
5. ASTM C553 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
6. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
7. ASTM C612 – Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
8. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
9. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
10. ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
11. ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
12. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C.
13. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
14. ASTM E96/E96M – Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
15. All applicable federal, state and municipal codes, laws and regulations for thermal insulation.

B. Sustainability Requirement Reference: The following sustainability requirements are hereby made a part of this Section by reference thereto:

1. High Performance Schools Exchange, Northeast Energy Efficiency Partnerships NE-CHPS, (referred to herein as “NE-CHPS”).

C. Definitions:

1. "R-Value": as referred to herein refers to the thermal resistance of the insulation alone and does not allow consideration of air spaces or other factors.
2. “HFC”: refers to regulated (prohibited) Hydrofluorocarbon organic compounds which are designated as having high Global Warming Potential (GWP).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. General: Coordinate the work of this Section with the respective trades responsible for installing interfacing and adjoining work for proper sequence of

installation, and ensure that the work performed hereunder is acceptable to such trades for the installation of their work.

B. Pre-installation Meetings: Installer of the Work of this Section is required to attend pre-installation conference(s) specified under the following sections

1. Section 07 16 13 – POLYMER MODIFIED CEMENT WATERPROOFING.
2. Section 07 27 13 - MODIFIED BITUMINOUS SHEET AIR BARRIERS.

1.5 SUBMITTALS

A. Information and Review Submittals: Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:

1. Product Data: Manufacturer's product data sheets, specifications, performance data, physical properties for each item furnished hereunder.
2. Sustainable Design Submittals: As required by NE CHPS.

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements:

1. Do not deliver items to the site, until all specified submittals have been submitted to, and approved by, the Architect.
2. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Storage and Handling Requirements:

1. Store and handle materials following manufacturer's recommended procedures, and in accordance with material safety data sheets.
   a. Rigid board insulation materials are combustible and may constitute a fire hazard, do not expose insulation materials to open flames or other ignition sources, comply fully with manufacturer’s recommendations and the requirements of local authorities having jurisdiction, for delivery, handling, storage and installation.
2. Protect materials from damage due to moisture, direct sunlight, excessive temperatures, surface contamination, corrosion and damage from construction operations and other causes.

C. Damaged material: Remove any damaged or contaminated materials from job site immediately, including materials in packages containing water marks, or show evidence of mold.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include the following, or approved equal:

1. Rigid insulation board (XPS - extruded polystyrene):
   a. Dow Chemical Corp., Midland MI.
   b. Owens Corning Commercial Insulation, Toledo OH.
   c. Kingspan Insulation LLC; Atlanta, GA.

2. Glass fiber batt/blanket insulation:
   a. CertainTeed Corporation, Valley Forge PA.
   b. Johns Manville Building Insulation, Denver CO
   c. Knauf Insulation, Shelbyville, IN.
   d. Owens Corning Fiberglas Corp., Toledo OH.
   e. USG Corp./ USG Interiors Inc., Chicago IL.
3. Mineral fiber insulation:
   a. Johns Manville, Inc., Denver CO.
   b. Rockwool, North America, Milton, Ontario. (Rockwool).
   c. Owens Corning (Thermafiber Division), Wabash IN. (Thermafiber)
4. Low pressure polyurethane foamed-in-place insulation / air barrier sealant:
   a. Fomo Products, Inc., Norton OH.
   b. DAP Products Inc., Baltimore, MD.
   c. Dupont, Inc., Wilmington, DE.

2.2 THERMAL INSULATION

A. Wall Insulation for Between Framing: Thermal batt/blanket glass fiber insulation conforming to ASTM C665 Type I, un-faced, comprised of inorganic fibers bonded with formaldehyde-free thermosetting resin.
   1. Surface burning characteristics when tested per ASTM E84:
      a. Flame Spread: 25 or less.
      b. Smoke Developed: 50 or less.
   2. Thicknesses and R-values:
      a. Walls: Thickness matching wall framing depth.
         1) Nominal 5-1/2 inch thick [139 mm] with R-21 thermal rating.
         2) Nominal 3-1/2 inch thick [89 mm] with R-15 thermal rating.
   3. Recycled content of glass in glass-fiber insulation: Use maximum available percentage of recycled glass. Fiber glass insulation products incorporated into the work shall contain not less than 20 percent of recycled glass cullet.

B. Foamed-in-place insulation for air barrier sealant: Single component / two-component low pressure polyurethane foam sealant:
   1. Regulatory Requirement: Pursuant to State of Rhode Island's "*Prohibition of Hydrofluorocarbons (HFCs) in Specific End-Uses*" regulation, 250-RICR-120-05-53; foam polyurethanes used for this project are prohibited from having HFC blowing agents used in manufacture of rigid PU low-pressure two component spray foam insulation and one component foam sealants, including HFC-134a and HFC-245fa (and blends thereof), blends of HFC-365mfc, commercial blends of HFC-365mfc with 7 to 13 percent HFC 227ea and the remainder HFC-365mfc, and Formacel TI.
      a. Acceptable products include but are not limited to:
         1) DAP Products Inc., product: "Touch 'n Foam Professional One-Component Low GWP".
         2) Dupont, product "HFC-Free Froth-Pak" (two component).
         3) Fomo Products, Inc., product: "HandiFoam E84 LowGWP"

C. Curtainwall insulation: Semi-rigid mineral wool insulation for perimeter fire containment systems at curtain walls: mineral wool fiber insulation board, conforming to ASTM C612, Types IA, IB and IVA, having a nominal density of 8 pounds per cubic foot, equal to Thermafiber product “FireSpan 90”, having FRK (Foil-reinforced kraft vapor retarder) facing.

1. Non-Combustible as tested per ASTM E136.
2. Flame Spread Classification: Class A (less than 25, per testing by NFPA 255, ASTM E84 or UL 723), with flame spread rating of 0 and smoke developed rating of 0.
3. Thermal Resistance: ASTM C518 (C177), R-value of 4.2 per inch.
4. Thickness: 3 inches, and as otherwise indicated on Drawings.

D. Exterior Wall Cavity Insulation type 1, (typical): Semi-rigid mineral wool insulation for exterior wall cavities: mineral wool fiber insulation board, conforming to ASTM C612, Type IVB having a nominal density of 4.4 pounds per cubic foot.

1. Non-Combustible as tested per ASTM E136.
2. Flame Spread Classification: Class A (less than 25, per testing by NFPA 255, ASTM E84 or UL 723), with flame spread rating of 0 and smoke developed rating of 0.
3. Thermal Resistance: ASTM C518 (C177), R-value of 4.2 per inch.
4. Thickness: As indicated on Drawings.
5. Size: 16 inches x 48 inches (406 mm x 1219 mm).
6. Acceptable products include the following or approved equal:
    a. Rockwool, Inc., Milton, Ontario, product “CavityRock MD”.
    b. Owens Corning (Thermafiber Division), Wabash IN, product “Thermafiber, RainBarrier 45.”
    c. Johns Manville, Inc., Denver CO. product: “MinWool Curtainwall CW4”.

E. Exterior Wall Cavity Insulation type 2, at rain screen walls: Rigid mineral wool insulation for exterior wall cavities: dual density mineral wool fiber insulation board, conforming to ASTM C612, Type IVB compliant, having a nominal density of 11 pounds per cubic foot.

1. Non-Combustible as tested per ASTM E136.
2. Flame Spread Classification: Class A (less than 25, per testing by NFPA 255, ASTM E84 or UL 723), with flame spread rating of 0 and smoke developed rating of 0.
3. Thermal Resistance: ASTM C518 (C177), R-value of 4 per inch.
4. Thickness: As indicated on Drawings.
5. Acceptable products include the following or approved equal:
    a. Rockwool, Inc., Milton, Ontario, product “Rockwool ComfortBoard 110”.
    b. Owens Corning (Thermafiber Division), Wabash IN, product “Thermafiber, RainBarrier ci High Compressive plus (110)”.
    c. Or equal.
6. Basis of Design: Rockwool, Inc., Milton, Ontario, product

F. Exterior Wall Cavity Insulation type 3, at indicated locations: Foil-faced rigid polyisocyanurate foam insulation manufactured with HCFC-free blowing agent and

laminated to 1.0 mil smooth reflective aluminum faces, on both sides, with square and shiplap edge, self-extinguishing. Insulation shall conform to property requirements of ASTM C1289, Type I, Class 1 or 2.

1. Long Term Thermal Resistance (LTTR) R-value per inch (as determined by ASTM C1289-11a, or later): R = 5.6 per inch.
2. Thickness as indicated on Drawings.
3. Flexural Strength per ASTM C203: 40 psi min.
4. Water Absorption per ASTM C209, (% by volume, max.): 0.1.
5. Water Vapor Permeance, ASTM E96/E96M, (perm, max.): <0.03.
6. Maximum Use Temperature: 250 °F.

2.3 EXTRUDED POLYSTYRENE INSULATION (XPS) [ADD #6]

A. Rigid Extruded Polystyrene Insulation (XPS) Closed Cell Foam Board:

1. Minimum R-value: 5 °F ft^2 h/Btu per inch thickness.

2. Regulatory Requirement: Pursuant to State of Rhode Island's "Prohibition of Hydrofluorocarbons (HFCs) in Specific End-Uses" regulation, 250-RICR-120-05-53, rigid insulation boards used for this project are prohibited from having HFC blowing agents used in manufacture of rigid extruded insulation, including HFC-134a, HFC-245fa, HFC-365mfc, (and blends of same), Formacel B, Formacel TI, and Formacel Z-6.

3. Under-slab and foundation insulation: Closed cell extruded polystyrene foam board (XPS), square edge, conforming to ASTM C578, Type IV, with a compressive strength of 25 pounds per square inch when tested in accordance with ASTM D1621.

a. Panel size: 48 by 96 inches beneath slab, and 24 by 96 inches at verticals.

b. Thickness: 2 inches.

c. Acceptable products include but are not limited to:

1) Dow Chemical Corp., product, Styrofoam Brand ST-100 Series "Square Edge" (Gray color board).

2) Kingspan Insulation LLC, product "GreenGuard 25 XPS LG".

3) Owens Corning, product "Foamular NGX 250".

~~2.3~~**2.4** ACCESSORIES

A. Staples, tape, adhesives and fasteners required for the proper and complete installation for work of this Section shall be as recommended by each respective manufacturers of each insulation type.

B. Staples, tape, adhesives and fasteners required for the proper and complete installation for work of this Section shall be as recommended by each respective manufacturers of each insulation type.

C. Foil-facing repair tape: Insulation recommended flashing for repairs of damaged facer:

1. 3M product "Venture FSK Facing Tape 1525CW." (Basis of Design).
2. Dow Chemical Company, product "LiquidArmor CM spray flashing" or product "LiquidArmor LT flexible single component silicone flashing"

3. Johns Manville, Inc, product: “JM UltraFast Flashing Tape”.
4. Rmax, product: ”R-Seal 3000” tape.

D. Adhesive for rigid insulation: Conforming with ASTM C-557-65T, equal to W.W. Henry Company, Huntington Park CA., product “118 - Foam Insulation Adhesive”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Inspect all surfaces and verify that they are in proper condition to receive the work of this Section.
1. Beginning of installation means acceptance of existing substrate and project conditions.

3.2 INSTALLATION

A. Install insulation baffles between roofing framing members (at sloped roofing) scheduled to receive batt/blanket insulation. Install as recommended by baffle manufacturer in manner to provide continuous free flow of air underside of roof sheathing, from bottom of roof to top of roof

B. Mineral Fiber insulation (cavity insulation types 1 and 2) in exterior wall cavities: Type 2 at rain screen wall cladding.
1. Install boards, friction fit, horizontally between wall reinforcement.
2. Install full thickness of insulation over the entire surface to be installed as indicated. Ensure tight fit around penetrating elements and abutting construction. All voids and gaps shall be filled. Minimize potential for thermal bridging.
3. Install insulation hold-down clips as per the manufacturer’s recommendations, and in conformance with the Building Code.
4. At completion of each days’ work, protect all exposed edges. Seal edges or lap over with a moisture retardant barrier.

C. Polyisocyanurate Rigid insulation (cavity insulation type 3) in exterior wall cavities, at indicated conditions.
1. Apply adhesive to substrate, in three continuous beads per board length to a full bed of 1/8 inch thick.
2. Place boards in a method to maximize contact bedding. Stagger vertical joints. Butt edges and ends tight to adjacent board and to protrusions or interruptions to the insulation plane. Place impale fastener locking discs. Tape seal board joints.
3. Install boards horizontally between wall reinforcement.

D. Batt and blanket insulation:
1. Install in accordance with manufacturer's instructions. Do not compress or “stuff” insulation into voids, compressed insulation has less thermal resistant value.
2. Trim insulation neatly to fit spaces. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation, do not cut around electrical boxes. Leave no gaps or voids.

3. Where faced insulation is specified, apply membrane facing on warm side of building spaces. Lap ends and staple side flanges of membrane between framing members.
4. Where insulation is located between joists/rafters and is not to be covered, install wire insulation supports to keep insulation in place.

E. Acoustical insulation:
1. Install insulation in accordance with insulation manufacturer's instructions.
2. Install in interior walls, and ceiling spaces where indicated. Trim insulation neatly to fit spaces. Fit insulation tight in spaces. Leave no gaps or voids.

F. Foamed-in-place insulation / air barrier sealant: Apply insulation in froth method to a uniform monolithic density without voids, in accordance with manufacturer's instructions.
1. Apply application of foam for air barrier seal includes, but is not limited to:
a. Door frames, window frames, and similar penetrations in exterior walls.
b. Gaps, cracks, cavities and joints in the building envelope, not sealed with other forms of air boots, including electrical boxes and conduit, ducts, fans, and piping.
c. Where additionally indicated on Drawings.

G. Low Pressure foamed-in-place insulation / air barrier sealant: Apply insulation in method to a uniform monolithic density without voids, in accordance with manufacturer's instructions.
1. Apply application of foam for air barrier seal includes, but is not limited to:
a. Door frames, window frames, and similar penetrations in exterior walls.
b. Gaps, cracks, cavities and joints in the building envelope, not sealed with other forms of air boots, including electrical boxes and conduit, ducts, fans, and piping.
c. Where additionally indicated on Drawings.

H. Insulation beneath slabs-on-grade and exterior of foundation walls: 2 inch thick rigid insulation. [ADD #6]
1. Place insulation boards at the exterior perimeter of foundation walls and beneath slabs-on grade.
a. At exterior perimeter of foundation walls, extend insulation from 2 inches below grade to top of footing.
b. Beneath slabs-on-grade, extend insulation to provide 100 percent coverage beneath slab.
2. Butt edges and ends tight to adjacent boards. Bevel insulation to allow snug fit at cants. Cut and fill insulation tightly to protrusions or interruptions to the insulation plane.
3. Place soil as a perimeter restraint to minimize movement of insulation.

3.3 CLEANING

A. Clean work under provisions of Section 01 73 00 – EXECUTION.

B. Daily clean work areas by sweeping and disposing of debris, and scraps.

C. Upon completion of the work of this Section in any given area, remove tools, equipment and all rubbish and debris from the work area; leave area in broom-clean condition.

End of Section

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Section 10 28 13
TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install toilet, bath and custodial accessories.

B. Furnish and install protection padding for exposed piping.

C. Install Owner-furnished (OFCI) toilet accessories.

D. Furnish concealed anchorage devices for handicap handrails for installation under Section 06 10 00 - ROUGH CARPENTRY.

E. Furnish toilet and bath accessory templates, to locate anchorage reinforcement, to trades responsible.

1.2 RELATED REQUIREMENTS

A. Section 01 10 00 - SUMMARY: Toilet accessories furnished and installed by Owner.

B. Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL: Procedural and administrative requirements relating to recycling goals, waste management program and reporting.

C. Section 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS: Procedural and administrative requirements relating to required *Northeast CHPS Verified Program,* (NE-CHPS) Certification.

D. Section 06 10 00 - ROUGH CARPENTRY:
   1. Wood blocking.
   2. Installation of concealed anchorage devices for grab bars in toilet rooms: Section 10 28 13 - TOILET ACCESSORIES.

E. Section 09 22 16 – NON-STRUCTURAL METAL FRAMING: metal framing and reinforcing plate blocking.

F. Section 09 29 00 - GYPSUM BOARD: Gypsum board partitions and metal framing.

G. Section 09 77 33 - SANITARY WALL PANELS: Glass fiber wall panels.

H. Section 10 21 13 - TOILET COMPARTMENTS.

1.3 REFERENCES

A. Referenced Standards: Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES. The standards referenced herein are included to establish recognized minimum quality only. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern. Equivalent quality and testing standards will be acceptable, subject to their timely submission, review and acceptance by the Architect.

1. ANSI A 117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable by Physically Handicapped People.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
4. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
5. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.
7. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
8. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
9. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
11. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use.
12. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
13. ASTM G222 - Standard Practice for Estimation of UV Irradiance Received by Field-Exposed Products as a Function of Location.

B. Sustainability Requirement Reference: The following sustainability requirements are hereby made a part of this Section by reference thereto:

1. High Performance Schools Exchange, Northeast Energy Efficiency Partnerships NE-CHPS, (referred to herein as “NE-CHPS”).

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. General: Coordinate the work of this Section with the respective trades responsible for installing inserts and anchorages furnished by this Section; make arrangements for delivery, receipt and installation of inserts and anchorages to prevent delay of the Work

B. Pre-installation Meetings: Installer of the Work of this Section is required to attend pre-installation conference specified under **Section 00 00 00 - TITLE**

C. Sequencing:

1. Field Measurements

a. Take field measurements before preparation of shop drawings and fabrication, where possible, to ensure proper fitting of Work.

b. Allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay Work.

1.5 SUBMITTALS

A. Information and Review Submittals: Submit the following under provisions of Section 01 33 00 - SUBMITTAL PROCEDURES:

1. Literature: Manufacturer's product data sheets, for each item furnished hereunder.
2. Schedule: Complete schedule, indicating types, quantity, and model numbers of accessories for each location in which the accessories will be installed.
3. Selection samples: Sample color chips indicating each manufacturer's full range of colors available for selection by Architect.
4. Verification samples: Complete units, as requested by Architect.
5. Sustainable Design Submittals: As required by NE CHPS.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers or bundles bearing brand name, identification of manufacturer or supplier and item identification number corresponding with approved schedule.

B. Store materials inside, under cover, and in manner to keep them dry, protected from weather, surface contamination, corrosion and damage from construction traffic and other causes.

C. Packaging Waste Management: Comply with packaging requirements specified under Section 01 60 00 - PRODUCT REQUIREMENTS.

1. Shipping materials: Manufacturer shall utilize to the greatest extent possible packaging materials which are biodegradable and recyclable.
2. Jobsite packaging waste management: Recycle packaging materials coordinated with general construction waste management specified under Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

B. Coordinate the work of this Section with placement of internal wall reinforcement.

1.8 WARRANTY

A. General: Submit the following warranties under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS, and in compliance with Section 01 78 36 – WARRANTIES.

1. Warranties shall be effective starting from Date of Project Substantial Completion and are effective for specified term lengths.

B. Manufacturer Warranty: In addition to the specific guarantee requirements of the GENERAL CONDITIONS and SUPPLEMENTAL GENERAL CONDITIONS, the Contractor shall obtain in the Owner’s name the standard written manufacturer’s

guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sheet steel: Cold rolled, commercial quality, ANSI/ASTM A 366.

B. Stainless steel sheet: ASTM A 167, Type 302/304.

C. Tubing: ASTM A 269 stainless steel.

2.2 TOILET ACCESSORIES

A. Manufacturer: To establish a standard of quality, design, function desired, and appearance, Drawings and specifications have been based on manufacturers and model numbers specified herein below. Manufacturers offering products which may be considered as equal include the following:

1. American Specialties, Inc. (ASI), Yonkers, NY.
2. Bobrick Washroom Equipment, Inc. (Bobrick), Clifton Park, NY.
3. Bradley Corporation / Washroom Accessories Division, (Bradley) Menomonee Falls, WI.
4. VonDrehle Corporation, Hickory, NC.

B. Coat/robe hook: Surface mounted satin finish stainless steel double robe hook, fabricated from 22 gage type 304 stainless steel, protrudes from wall nominally 1-7/8 inches.

1. ASI model Nº. 7345-S.
2. Bobrick model Nº. B-76727.
3. Bradley model Nº. 9124.

C. Electric dryer: High speed, low energy consumption surface-mounted hand dryer with no-touch infrared-sensor operation. Automatic shut-off after 90 seconds of non-use. GreenSpec™ Listed.

1. Electrical requirements, 115 volt AC, 9 amp, 60hz. 900-1500 watts.
2. Cover: One piece aluminum housing or die-cast zinc alloy, with brushed stainless steel finish.
3. Acceptable models:
   a. Dyson Airblade V Hand Dryer, HU02 Sprayed nickel.
   b. ASI 'Turbo-Dry High Speed Dryer', model Nº. 0197-1.
   c. Excel Dryer model Nº. XL-SB
   d. World Dryer 'Airforce' series, model Nº. J974.
4. Accessories: Approved manufacturers accessories equal to Speed and Sound Control Kit part #40112 and Noise Reduction Nozzle part #62.2. Unit to have a Max dB level rating of 70-72dB. Accessories ADA recess kit; In single toilet rooms "Xlerator Part ID 40502", In gang toilet rooms "Xlerator Part ID 40551".

D. Grab bars (of lengths and configurations as indicated on Drawings): Stainless steel, minimum wall thickness 18 gage (Stub's gage), with non-slip knurled, peened or striated surface.

1. Grab bars (Child): 1 inch diameter with satin finished ends, concealed mounting and snap flange with cover secured by 4 set-screws, equal to:
    a. ASI series 3700.
    b. Bobrick series: B-530-X18.
    c. Bradley series (n/a). 852
2. Grab bars (Adult): 1-1/4 inch diameter with satin finished ends, concealed 1/8 inch thick mounting flange with snap-on cover, equal to:
    a. ASI series 3700.
    b. Bobrick series B-5806.99.
    c. Bradley series 832.

E. Grab bars at accessible showers: Stainless steel, minimum wall thickness 18 gage (Stub's gage), with non-slip knurled, peened or striated surface. 1-1/4 inch diameter with satin finished ends, concealed 1/8 inch thick mounting flange with snap-on cover. (Provide configuration as indicated on Drawings).

1. "L" shape grab bar with 42 inch and 24 inch leg lengths:
    a. ASI model 3700-P Series in dimensions indicated.
    b. Bobrick series: B-5806.99 Series in dimensions indicated.
    c. Bradley series: 832 Series, in dimensions indicated.
2. "L" shape grab bar with 30 inch and 30 inch leg lengths:
    a. ASI model 3700-P Series in dimensions indicated.
    b. Bobrick series: B-5806.99 Series in dimensions indicated.
    c. Bradley series: 832 Series in dimensions indicated.

F. Mirrors, framed: Type 1 (Child): 18 inches wide by 30 inches high and Type 2 (Adult): 40 inches wide by 30 inches high having the following:

1. Frame: one piece 3/4/ by 3/4 inch type 304 18 gage stainless steel roll formed frame, with continuous integral stiffener on all sides. Corners shall be heliarc welded, ground and polished smooth. corners
2. Back: 20 gage galvanized steel back attached to frame with concealed screws.
3. Mirror glass: 1/4 inch thick safety glass, ASTM C 1048 FT, fully tempered, complying with Class 1 clear, quality q3 glazing select, conforming to ANSI Z97.1, with Class 1, standard commercial quality, electro-copper back-plating protected by a corrosion-resistant zinc-coating.
4. Acceptable models:
    a. ASI model Nº. 0600-
    b. Bobrick model Nº. B-2908-
    c. Meek model Nº. M1210

G. Mop and broom holders: Surface mounted, nominal 44 inch long stainless steel unit with 18 gage 8 inch deep continuous shelf, 5 stainless hooks and 4 mop/broom holders, anti-slip spring loaded, rubber cam mop holders, capable of holding 7/8 to 1-1/4 inch diameter handles.

1. ASI model 1308B.
2. Bobrick model Nº. B-239-44.
3. Bradley model Nº. 9934.

H. Paper Towel Dispenser (designated PT on Drawings): surface mounted paper towel dispenser with stainless steel door and cabinet, welded construction having a minimum capacity of 400 C-Fold towels or 525 multi-fold towels. [ADD #6]

1. **AJW model Nº. U180.**
2. **ASI model Nº. 0210.**
3. **Bobrick model Nº. B-262.**
4. **Bradley model Nº. 250-15.**
5. **Locations: Science Rooms, CTE, Teach Planning, Nurse, Administration and elsewhere indicated).**

~~H.~~**I.** Sanitary napkin disposal (Type 1): Surface mounted feminine napkin disposal unit, fabricated of type 304 stainless steel, with one piece cover.

1. A.S.I., model 0852
2. Bobrick model B-270 (“Contura” Series)
3. Bradley model Nº. 4722-15

~~I.~~**J.** Sanitary napkin disposal (Type 2): Partition mounted feminine napkin disposal unit serving two toilet compartments.

1. A.S.I. 0472
2. Bobrick B-354
3. Bradley model Nº. 4721-15

~~J.~~**K.** Sanitary napkin/tampon vendor (Type 1): Semi-recessed stainless steel napkin/tampon vendor having a capacity of 30 napkins and 27 tampons. (requires 4 inch wall depth).

1. Mechanism handle turns and shall be operable to comply with ADA Accessibility Guidelines (ADAAG).
2. Coin operation: Equip with single 25 cent coin mechanism.
3. Acceptable models:
   a. ASI model Nº. 0468-2-F. (Basis of Design)
   b. Bobrick model Nº. B-370634C
   c. AJW model Nº. (n/a).
   d. Bradley model Nº. (n/a).
4. Locations: Girls multi-use toilet rooms and gender neutral toilet rooms, SPED/SwD Toilet rooms and Nurse Toilet rooms (T102, T106, 129A (Girls Locker Room), T202, T206, T302, T306, T402, T108, 128A (Gender Neutral Locker Room), T204, T308, 326B (Music Storage), 326A (Music Storage), T404, 101B, 105B, 202A, 204A, 112J, 112K).

~~K.~~**L.** Sanitary napkin/tampon vendor (Type 2): Semi-recessed stainless steel napkin/tampon vendor having a capacity of 30 napkins and 27 tampons. (requires 4 inch wall depth).

1. Mechanism handle turns and shall be operable to comply with ADA Accessibility Guidelines (ADAAG).
2. Coin operation: Equip with single 25 cent coin mechanism.
3. Acceptable models:
   a. AJW model Nº. U526-25.
   b. ASI model Nº. 6468-25.
   c. Bobrick model Nº. B-3500-25 (pull handle).
   d. Bradley model Nº. (n/a).
4. Locations: Staff Toilet Rooms (T105, 127A, 214B, 314B, T203, T103, T109, T303, T403, T307).

~~L.~~**M.** Shower curtains and rods:

1. Curtain rods: 1-1/4 inch diameter, Stainless steel, minimum wall thickness 18 gage (Stub's gage), with stainless steel 2-1/2 inch flange and concealed fasteners. Lengths for locations shown on the Drawings.
   a. ASI model 1206
   b. Bobrick model B-6047.
2. Curtain hooks: 18-8, type 304 Stainless steel, 0.09 inch diameter. Provide one hook for every 6 inches, or fraction thereof of each curtain rod.
3. Polyester shower curtain: white, 100 percent polyester mildew resistant, Teflon coated for water repellency and stain resistance. Fabricate curtain with hemmed edges and a fully weighted, anti-fungus, mildew resistant bottom hem and corrosion-resistant grommets along reinforced top edge every 6 inches (152 mm) on center through top hem.

~~M.~~**N.** Shower seat Type 1: Folding type with cushion shall have a frame constructed of type-304, satin finish stainless steel. Seat cushion shall be 1-1/2 inches thick foam padding mounted on 1/ inch thick plywood and covered in water-resistant reinforced vinyl fabric. Seat shall be able to lock in upright position when not in use and comply with ADA Accessibility Guidelines (ADAAG). Seat supports shall not come into contact with floor. Provide left or right hand seat. ~~*(Addendum No. 6)*~~ **[ADD #6]**

1. A&J model Nº. U933-1AR or U933-1AL, as indicated.
2. ASI model Nº. 8205R or 8205L as indicated.
3. Bobrick model Nº. B517 or B518, as indicated.

~~N.~~**O.** Shower seat Type 2: Folding seat having a frame constructed of type-304, satin finish stainless steel, 16-gauge (1.6 mm), 1-1/4" (32-mm) square tubing, and 18-gauge (1.2-mm), 1" (102-mm) diameter tubing. Seat 18 inches wide and project nominally 16 inches from wall and have a 2 inch thick foam padded, white vinyl seat with enclosed 1/2 inch thick plywood base. Seat supports shall not come into contact with floor. Seat shall fold against wall when not in use. ~~*(Addendum No. 6)*~~ **[ADD #6]**

1. ASI model Nº. 8204.
2. Bobrick model Nº. B-519.

~~O.~~**P.** Shelving: Custodial shelf, stainless steel, 6 inches deep by 18 inches wide with 3/4 inch edge return. Mounting brackets, 16 gage welded to shelf.

1. ASI model Nº. 0692.

2. Bobrick model Nº. B-296.
3. Bradley model Nº. 756.

~~P.~~**Q.** Soap Dispensers (Child and Adult): Owner Furnished Contractor Installed (OFCI). Coordinate and provide blocking as required to properly mount dispensers where indicated on the Drawings.

~~Q.~~**R.** Toilet tissue dispenser: Surface-mounted, jumbo-roll, toilet tissue dispenser, constructed of type-304 stainless steel. Dispensing mechanism accommodate two 10" (254-mm) diameter toilet tissue rolls; and be equipped with a sliding access panel that exposes one roll at a time. Spindles shall be convertible in the field to dispense 3" or 2-1/4" (76 or 57 mm) diameter core rolls with use of removable core adapters furnished.

1. ASI model Nº. 0040.
2. Bobrick model Nº. B-2892.
3. Bradley model Nº. 5425.

S. Adult Changing Table: Wall mounted, powered height adjustable, adult changing station having the following features.

1. Acceptable products include the following, or approved equal

a. Max-Ability Inc., model: :Pressalite 3000.

b. Koala Kare Products (Division of Bobrick): model KB3000-AHL.

c. Smirthwaite, model “Hi Riser Changing Bench”.

2. Minimum Load Capacity: 440 pounds (200kg).Units exceed static load requirements called out by ASTM F2285, Standard Consumer Safety Performance Specification for Diaper Changing Stations for Commercial Use.

3. Powered-Height Adjustability: Electronically adjustable from 12” (300mm) to 41” (1041mm). Provide control pendant available for height adjustment.

4. Front Safety Guard: One-hand operation. Guard shall lock in raised position along front side of changing bed. Guard shall have dip in top edge to facilitate caregiver reaching over guard to change patient. Guard shall rotate and lock under changing bed in stored position.

5. Changing Bed: Surface shall be minimum 72 inches long, and 31 inches wide with hydrogenic padded Surface.

6. Instruction graphics/written instructions shall be printed for visibility and permanently engraved into plastic or metal for resistance to vandalism.

7. Provide optional safety strap.

8. Finish: Powder coat.

Warranty: Furnish manufacturer’s 3 year limited warranty on materials and workmanship.
[ADD #6]

2.3 LOCKS

A. General: All locks shall be keyed alike. Provide four (4) keys, for lockable accessories, to the Owner.

2.4 INSTALLATION ACCESSORIES

A. Fasteners, screws, and bolts: Type 304 stainless, tamperproof.

B. Expansion shields: Fiber, lead or rubber as recommended by accessory manufacturer for component and substrate.

2.5 FABRICATION

A. Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion, scratches or dents. Weld and grind smooth joints of fabricated components.

B. Back paint components where contact is made with building finishes to prevent electrolysis.

C. Shop assemble components and package complete with anchors and fittings. Hot dip galvanize exposed and painted ferrous metal and fastening devices. Provide steel anchor plates, adapters, and anchor components for installation.

2.6 FACTORY FINISHING

A. Ferrous metals: Clean and treat, spray apply one coat of baked-on rust and moisture-resistant primer, followed by two coats of baked-on synthetic enamel, in selected colors. Ensure that finish coating is uniform in color intensity and degree of gloss, throughout.

B. Chrome/Nickel Plating: ASTM 456, Type SC2, satin finish.

C. Stainless steel: Number 4 satin finish, except as otherwise specified above under manufacturer’s available colors.

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide templates and rough-in measurements as required. Deliver inserts and rough-in frames to site at appropriate times for building-in by other trades

B. Coordinate with trades responsible for providing receiving surfaces on which accessories will be installed.

C. Exact locations of accessories within each room or area shall be as directed by the Architect.

3.2 INSTALLATION

A. Perform installation work in accordance with the approved shop drawings and the manufacturer's installation instructions.

B. Install toilet accessories absolutely level and in true line, securely and rigidly anchored with theft proof fasteners of the size and type most appropriate for the specific receiving surface, concealing the fasteners as far as practicable.

3.3 ADJUSTING

A. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

3.4 CLEANING

A. Remove all protective films and coverings from accessories, and clean and polish each piece. Remove all rubbish, packing materials, and debris, caused by the work of this Section.

End of Section

Section 31 00 00
EARTHWORK

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. The General Documents, as listed in the Table of Contents, and applicable parts of Division 1, GENERAL REQUIREMENTS, shall be included in and made a part of this Section.

B. Examine all drawings and all other Sections of the Specifications for the requirements therein affecting the work of this trade. Plans, surveys, measurements and dimensions, under which the work is to be performed are believed to be correct to the best of the Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein. The contractor shall reconcile all drawings. Where there is a conflict between drawings, the interpretation that most in favor of the owner shall be adopted.

C. The Contractor shall become thoroughly familiar with the site, consult records and drawings of adjacent structures and of existing utilities and their connections, and note all conditions which may influence the work of this Section.

D. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

E. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure a steady progress of work under this Contract.

1.2 SCOPE OF WORK

A. The work of this section consists of all excavation, filling and grading and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:

1. All materials, equipment, labor and services required for all Earth Moving work, including all items incidental thereto, as specified herein and as shown on the Drawings.
2. Excavation of all types, including but not limited to excavations for footings, slabs, foundations, retaining walls, new pavements, ramps, stairways, equipment pads, curbs, sidewalks, and utilities, to the lines and grades shown in the Drawings or the limits specified herein, whichever is deeper. Excavation shall include removal and legal offsite disposal of all materials that cannot be reused.
3. Excavating, filling, trenching, backfilling, compaction and concrete encasement of utility conduits, of all description, required for the construction of foundations, walls, building structures, retaining walls, new pavements, ramps, stairways, equipment pads, curbs, sidewalks, utility structures, lawn areas, athletic fields, and site improvements. Provide all additional fill materials as required and specified herein. Refer to Sections on Heating, Plumbing, Fire Protection, Electrical and Structural for other excavation.

4. ~~Entirely~~ **Pre-trenching to remove obstructions before the start of installation of ground improvements for buildings, retaining walls, and site structures.**~~removing topsoil, subsoil, tree stumps, root balls, buried organic soil, asphalt, concrete structures, demolition debris, below ground structures, existing fill, and other deleterious matter from within the proposed building footprint~~. **[ADD #6]**
5. Entirely removing topsoil, subsoil, surficial organic material, tree stumps, root balls, asphalt, concrete and other deleterious material from within the proposed paved areas.
6. Removing topsoil, subsoil, root balls, tree stumps, and other deleterious material from within the proposed athletic fields where the grades are anticipated to be raised. The surficial organic material, asphalt, and concrete shall be removed from within the proposed athletic fields in accordance with the recommendation provided by the Landscape Architect.
7. Improving the existing fill under the subbase of paved areas and proposed athletic fields.
8. Screening and stockpiling the topsoil for reuse as directed by the Architect.
9. Performing test pits before start and during construction as required by the Geotechnical Engineer.
10. Removing and disposing of spoiled material not suitable for fill from the site. No burning on the site shall be permitted.
11. Rehandling, hauling and placing of stockpiled materials for use in refilling, filling, backfilling, grading and such other operations. Stockpiling shall include protection to maintain materials in a workable condition.
12. Furnishing, placing, and compacting fill materials.
13. Removing, hauling, stockpiling, rehandling, and placement of materials. Over-excavation to remove unsuitable materials.
14. Proofrolling of exposed subgrade for fill, footings, foundations, slabs, walks, pavements, lawns and grasses, and exterior plants.
15. Backfilling of excavations for foundations, footings, walls, utilities, pavements, sidewalks, and landscaped areas with specified on-site and imported materials.
16. Disposing off-site of excess or unsuitable materials.
17. Placing bedding, sub-base and base course layers.
18. Stabilizing/mitigating of saturated or otherwise disturbed materials.
19. Performing rough and final grading.
20. Filling slopes and site retaining walls.
21. Installing excavation support, shoring or bracing as necessary
22. Protecting existing buildings, utilities, roads, pavements, lawns, planting and other improvements from damage due to construction.
23. Performing coordination of material testing shall be the responsibility of the Contractor. All imported material tested shall be under ASTM D422 and shall be paid for by the Contractor.
24. Performing material testing, and field density testing as needed.
25. Performing dust control and cleanup.
26. Dewatering.

27. Installing fencing and safety devices or controls as specified and as necessary.
28. Notifying all affected utility companies and Dig Safe before the start of work.
29. **Laying out ground improvement locations using survey equipment. [ADD #6]**

~~28.~~**30.Performing vibration monitoring. [ADD #6]**

B. The Work of this Section shall include performance of pre and post construction condition surveys.

1.3 CONTRACT REFERENCE

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

B. Related Sections

1. Section 01 42 00, References
2. Section 01 45 00, Quality Control
3. Section 01 50 00, Temporary Facilities and Controls
4. Section 02 41 00, Site Demolition
5. Section 03 30 00, Cast-in-Place Concrete
6. Section 22 00 00, Plumbing
7. Section 31 10 00, Site Preparation and Clearing
8. Section 31 23 19, Dewatering and Drainage
9. Section 31 25 00, Erosion Control

~~9.~~**10.Section 31 60 00, Ground Improvements [ADD #6]**

~~10.~~**11.**Section 32 13 13, Site Concrete

~~11.~~**12.**Section 33 40 00 Storm Drainage Systems

~~12.~~**13.**Division 01 Section “Unit Prices”

~~13.~~**14.**Division 01 Section "Temporary Tree and Plant Protection”

~~14.~~**15.**Division 31 Section “Trench Excavation and Backfill”

~~15.~~**16.**Division 31 Section "Dewatering"

~~16.~~**17.**Division 32 Section "Turf and Grasses"

~~17.~~**18.**~~Appendix A~~, **Appendix E** Geotechnical Report **[ADD #6]**

1.4 DESCRIPTION

A. The Contractor shall furnish all labor, material, tools and equipment necessary to excavate materials; segregate, track, handle, sample, analyze, and test excavated materials, backfill, and re-grade as indicated on the Drawings.

B. The Contractor shall use suitable on-site soils and fill, and soil from off-site sources, as needed. Please note that most of the on-site materials will likely not be suitable for reuse, nor will all required material gradations be present on the site. The contractor shall avoid mixing the reusable soils with fine-grained and/or

organic soils. Imported materials or blending of onsite materials with imported materials are anticipated for this project.

C. The Contractor shall make excavations in such a manner and to such widths that will provide suitable room for performing the Work and shall furnish and place all sheeting, bracing, and supports, if necessary. Excavation support is anticipated for this project.

D. The Contractor shall provide labor and material for all pumping and draining, if necessary; and shall render the bottom of excavation firm and dry and in all respects acceptable. The Contractor shall collect and properly dispose of all discharge water from dewatering systems in accordance with local and State requirements and permits.

E. The Contractor shall raise the Site to final grades and compact the subgrade and intermediate layers to the required criteria set forth within this Section.

F. The contractor shall provide routine monitoring of in-place excavation support system.

G. Contractor shall protect and moisture condition all on site and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture in order to maintain suitable workability of the soil materials. Failure by the Contractor to follow this requirement shall not be cause for additional cost to the Owner.

~~G.~~**H. Protect subgrades of footings, slabs, retaining walls, pads, stairs, sidewalks, roadways, and utilities from frost, [ADD #6]**

1.5 INFORMATION

A. Information on the Drawings, Reference Drawings, Geotechnical Reports, and in the Specifications relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for information and is not guaranteed.

B. Site Information – Data on indicated subsurface conditions are not intended as representations or warrants of continuity of such conditions between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn there by the Contractor. Data is made available for the convenience of the Contractor. The Owner, Architect and Engineer assume no responsibility for the accuracy of the data other than at the particular locations and at the time the explorations were made.

C. The Contractor, at his/her own expense, may conduct additional subsurface testing for his/her own information after approval by the Owner. The Owner assumes no responsibility for the Contractor's failure to make his own site investigation and makes no representation other than the soils reports regarding the character of the soil or subsurface conditions which may be encountered during the performance of the work. The Contractor shall refer to the Geotechnical Report. Failure by the Contractor to be aware of existing site conditions shall not be cause for additional cost to the Owner.

1.6 SUBSURFACE CONDITIONS AND SPECIAL SITE CONSIDERATIONS

A. Geotechnical testing including subsurface explorations have been made by qualified Contractors for this site. This information is provided in the attached Preliminary Geotechnical Report by Lahlaf Geotechnical Consulting, Inc., dated ~~February 7~~**August 4**, 2023 ("Geotechnical Report"). The Owner, the Architect, and the Geotechnical Engineer assume no responsibility for the accuracy of the data and for the Contractor's failure to make his own site investigation and make no representation other than the soils reports regarding the character of the soil or subsurface conditions which may be encountered during the performance of the work. The Contractor shall refer to Section 00 31 32. Failure by the Contractor to be aware of existing site conditions shall not be cause for additional cost to the Owner. **[ADD #6]**

1. Information on subsurface conditions is made available for the convenience of the Bidders. The Owner does not represent to the Contractor that the information is either an accurate or a comprehensive indication of subsurface conditions. Bidders are invited to review the information to apprise themselves of the information available, and also to make additional investigations at their own expense.
2. Interpretation of this data for purposes of construction is the responsibility of the Contractor. It is the Contractor's responsibility to make interpretations and draw conclusions with respect to the character of materials to be encountered and groundwater conditions at the site and their impact upon Contractor's work based on his expert knowledge of the area, construction dewatering methods, and support of excavation methods. Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.
3. The Geotechnical Report indicates that the materials present at the site include fill, peat, organic soil, silt, and sand. The contractor is made aware of this condition and will not be eligible to receive additional compensation exceeding the Contractor's initial bid for imported material.
4. It is the responsibility of the Contractor under this Contract to do the necessary excavation, filling, grading and rough and final grading to bring the existing grades to subgrade and parallel to finished grades as specified herein and as shown on the Drawings for this Work. The Contractor shall visit the site prior to submitting a bid to become familiar with the extent of the work to be done under this Contract. The Contractor shall be responsible for determining the quantities of earth materials necessary to complete the work under this Section. All earth materials shall be included in the Contractor's base bid.
5. No claim for extra cost or extension of time resulting from reliance by the Contractor on information presented herein shall be allowed, except as provided in the Contract Documents.

B. Environmental investigation and testing, including subsurface explorations have been made by qualified Contractors for this site. This information is provided in the attached Phase I Environmental Site Assessment and Limited Subsurface Investigation by Sage Environmental, Inc., dated November 8, 2021.

1. Laboratory analytical results for select soil samples collected from the Site identified a number of semi volatile organic compounds (SVOCs), arsenic, lead, and total petroleum hydrocarbons (TPH) in excess of the RIDEM Method 1 Residential Direct Exposure Criteria (R-DEC).

2. No groundwater impacts were identified above RIDEM GB Groundwater Objectives at the Site.
3. Handing, reusing, and disposing of onsite soils in accordance with RIDEM regulations and requirements shall be included in the Contractor's base bid.

1.7 QUALITY CONTROL

A. The Owner may retain and pay for the services of an independent testing agency (Soils Representative) to monitor backfill operations, perform laboratory tests on soil samples, and to perform field density tests; and a Geotechnical Engineer to periodically observe the earthwork operations, observe the preparation of the subgrade for footings, slabs, and paved areas, and to review laboratory and field test data. The geotechnical engineer may from time to time request that the contractor excavate tests pits ahead of excavation to confirm subsurface conditions. Test pits shall be performed at no additional cost to the Owner.

B. The services of the Soils representative may include, but are not limited to performing observations and testing during placement of fills within the proposed building, parking area, and controlled fill areas.

C. The Contractor shall make provisions for allowing safe and timely observations and testing of Contractor's Work by the Geotechnical Engineer and by Soils Representative. The presence of the Soils Representative and/or the Geotechnical Engineer does not include supervision or direction of the actual work of the Contractor, his employees or agents. Neither the presence of the Soils Representative and/or the Geotechnical Engineer, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

D. Costs related to retesting due to unacceptable quality of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

1. Testing frequency shall be as follows:

Material	Responsible Party	Situation	Test	Minimum Frequency
Structural Fill/ Ordinary Fill/ Gravel Borrow/ Common Borrow/ Bedding Material/ Crushed Stone / Pea Gravel	Contractor	Source Investigation	Grain Size through 0.002 mm	1 per source
			Moisture Density Relationship	1 per source
	Owner	During Placement	Grain Size through 0.002 mm	1 per 100 tons
			Moisture Density Relationship	1 per 100 tons
	Owner	As-Placed	Dry Density and As-Placed Moisture	2 per lift per location or activity and no less than 1 every 500 sf
Loam Borrow	Contractor	During Placement	PH, Nitrogen, Phosphorous, Potassium, and USDA Classification	2 per Acre
Riprap	Contractor	Source Investigation	Source Material Certification	1 per source
			Specific Gravity	1 per source
	Contractor	During Placement	Source Material Certification	1 per 500 tons
			Specific Gravity	1 per 500 tons

1.8 COORDINATION

A. Prior to start of earthwork, the Contractor shall arrange an onsite meeting with the Architect, Engineer, the Geotechnical Engineer, and the testing agency for the purpose of establishing the Contractor's schedule of operations, and scheduling observation and testing procedures and requirements.

B. As construction proceeds, the Contractor shall be responsible for notifying the Geotechnical Engineer at least 2 days and the testing agency at least 24 hours prior to the start of earthwork operations requiring observation and/or testing. This section also applies to instances when the General Contractor resumes earthwork operations after a period of pause in earthwork operations that require observations by the Geotechnical Engineer.

C. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to ensure the steady progress of all work of the Contract.

1.9 PERMITS, CODES AND SAFETY REQUIREMENTS

A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926. Contractors shall be familiar with the requirements of these regulations.

B. The Contractor is responsible for the adequacy of the excavation support system and shall retain the services of a Professional Engineer registered in Rhode Island to design any required excavation support systems. The Contractor’s Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support systems and shall design in conformance with OSHA requirements. The Contractor’s Professional Engineer shall provide sufficient on-site inspection and supervision to assure that the excavation support system is installed and functions in accordance with his design. Criteria listed herein defining the responsibilities of the Contractor’s Professional Engineer are minimum requirements.

C. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.

D. Comply with the rules, regulations, laws and ordinances of the City of Central Falls, of the State of Rhode Island, appropriate agencies of the State of Rhode Island and all other authorities having jurisdiction. Coordinate all work done within City and State rights of way with the appropriate agencies, including the RI Department of Transportation. Provide all required traffic control and safety measures, including uniformed police officers per City and State requirements. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

E. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration (OSHA), United States Department of Labor whichever is more stringent.

F. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

G. The Contractor shall not close or obstruct any street, sidewalk, or passageway unless authorized in writing by the Architect. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, sidewalks or other facilities near enough to the work to be affected hereby. The Contractor shall comply with the time limits established by the terms for trucking onto and off the site.

H. Any apparent conflict between the Drawings and Specifications and the applicable codes and regulations shall be referred to the Architect in writing, for resolution before the work is started.

I. The Contractor shall comply with all excavation, trenching, and related sheeting and bracing requirements of Occupational Safety and Health Administration (OSHA) excavation safety standards, 29 CFR Part 1926.650 through 1926.652.

1.10 LAYOUTS AND GRADES

A. All line and grade work not presently established at the site shall be laid out by a survey team under the supervision of a Land Surveyor or Professional Engineer registered in the State of Rhode Island and employed by the Contractor in accordance with Drawings and Specifications. Basic layout for the project is shown on the drawings. The Contractor shall supply all additional layout and grade control as necessary to properly implement and construct the work. The Contractor shall establish permanent benchmarks and replace as directed any which are destroyed or disturbed. The Contractor shall employ and pay all costs for a registered Civil Engineer or Surveyor who is licensed within the jurisdiction of the project site to lay out all lines and grades in accordance with the Drawings and Specifications, and as necessary or required for the construction. The Contractor shall submit building layout drawings for approval, stamped by a Registered Surveyor.

B. The words “finished grades” as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas outside of the building shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades.

C. The word “subgrade” as used herein, means the surface or elevation remaining after completing excavation or top surface of a fill or backfill required surface of subsoil, borrow fill or compacted fill. This surface is immediately beneath the site improvements, fill materials as dimensioned on the Drawings, or other proposed surface material.

D. The words “rough grading” shall mean excavating or filling to elevations indicated, and to the required depths herein. The permissible tolerance of rough grading within an area 100 sq. ft. shall not exceed plus or minus 2 in. The cost of placing fill material to refill areas having rough grades lower than designed shall be borne by the Contractor.

1.11 DISPOSITION OF EXISTING UTILITIES

A. All work shall be executed in such a manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures and adjoining property. Existing streets, sidewalks and curbs damaged during the project work shall be repaired or replaced to their condition prior to commencement of Earth Moving operations.

B. Locate and mark underground utilities to remain in service before beginning the work. Active utilities existing on the site and work areas shall be carefully protected from damage and relocated or removed as necessitated by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

C. Inactive or abandoned utilities encountered during construction operations shall be removed and suitably backfilled if within the building area. Abandoned utilities outside the building area shall be removed, grouted, plugged or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect.

D. The Contractor shall notify “Dig Safe” and local utility companies prior to the start of construction. The “Dig Safe” number shall be submitted by the Contractor in writing to the Architect prior to construction.

E. Acceptance of any of the Contractor’s plans, design calculations and methods of construction by the Designer shall not relieve the Contractor of the responsibility for the adequacy of the excavation lateral support system; preventing damage to existing or new structures, utilities and streets adjacent to excavations; the safety of persons working within excavated areas and the public at large; and excavation dewatering.

1.12 SUPPORT OF EXCAVATION

A. Provide support of excavation (SOE) system, as necessary, in order to meet the requirements of OSHA and to assure complete safety against collapse of earth at sides of excavations. The contractor shall design and submit for review and upon approval install a temporary support of excavation (SOE) to protect the existing foundations during construction.

B. In selecting the type of SOE system, the Contractor shall take into consideration the possible presence of rock and the presence of boulders in the existing fill and in the natural soil.

C. If sufficient or proper supports have not been provided, additional supports shall be placed at the expense of the Contractor. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

D. All components of SOE system not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density.

E. The design and installation of SOE systems shall not constitute a condition for which an increase may be made in the contract price with the exception that if the Architect directs with writing that certain shoring or sheeting shall be left in place, the contract price will be adjusted in accordance with General Conditions.

F. SOE systems shall be designed to support the earth pressures, surcharge loads from stored material and construction equipment.

G. Shoring and bracing of trenches and other excavations shall, at a minimum, be in accordance with the latest requirements of the Department of Labor and Industries Bulletin No. 12, Section 10, and all subsequent amendments, and OSHA excavation safety standards.

H. SOE systems shall be designed by a Professional Engineer registered in the State of Rhode Island and hired by and paid for by the Contractor.

~~H.~~**I. Components of the SOE system and permanent structures near SOE systems shall be monitored for vertical and lateral deformations. [ADD #6]**

1.13 DRAINAGE AND GROUNDWATER CONTROL

A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of groundwater and surface water in excavated areas and adjacent properties.

B. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. The flows of all water resulting from pumping shall be managed so as not to cause erosion, siltation of drainage systems, or damage to adjacent property.

C. The groundwater level shall me maintained at 12 inches beneath the bottom of excavation or deeper until the excavation is backfilled to at least 2 feet above the groundwater level.

D. Damage resulting from the failure of the dewatering operations of the Contractor, and damage resulting from the failure of the Contractor to maintain all the areas of work in a suitable dry condition, shall be repaired by the Contractor, as directed by the Engineer, at no additional expense to the Owner. The Contractor's pumping and dewatering operations shall be carried out in such a manner as to prevent damage to the Contract work and so that no loss of ground will result from these operations. Precautions shall be taken to protect new work from flooding during storms or from other causes. Pumping shall be continuous to protect the work and/or to maintain satisfactory progress.

E. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water from the trenches, excavations, and stormwater management operations shall be disposed of in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

F. The Contractor shall excavate interceptor swales and ditches, as necessary, prior to the start of major earthmoving operations to reduce the potential for erosion and to keep areas as free from surface and ponded water as possible.

G. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

H. Should surface, rain or groundwater be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping to keep all excavations clear of water at all times and shall be

responsible for any damage to work or adjacent properties for such water. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

I. The presence of groundwater or stormwater in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.

J. For further information refer to paragraphs on SPECIAL REQUIREMENTS FOR SEQUENCE OF CONSTRUCTION OPERATIONS AND DRAINAGE AND EROSION CONTROL as specified herein.

1.14 FROST PROTECTION / WORK IN FREEZING WEATHER

A. Protect excavation bottoms and sides against freezing. Provide protective insulating materials as necessary, including by means of heat blankets, and heating plant.

B. A layer of fill shall not be left in an uncompacted state at the close of a day's operation when there is the potential for that layer to freeze.

C. The Contractor shall not place any material on snow, ice, frozen soil, or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be at the Contractor's expense.

D. Do not excavate to full indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade, the materials installed, and the excavation backfilled the same day. Protect the excavation from frost if placing of materials or backfilling is delayed.

E. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as necessary to carry out the work.

F. No materials shall be installed on frozen ground. Fill materials shall be free of frost.

G. The subgrade of footings and slabs shall be protected from frost before placing concrete. The subgrade on the sides of the footings shall be protected from frost after the footings are constructed until sufficient fill is placed to protect the bottom of footings from frost induced heave. Uninsulated slabs shall be covered with heat blankets until the slab areas are heated. The cover shall extend at least 4 feet beyond the limits of the slabs.

~~G.~~**H. Subgrade materials that freeze shall be removed and replaced at no additional cost to the Owner. [ADD #6]**

1.15 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

A. The Contractor shall take the necessary steps to avoid disturbance of subgrade and underlying natural soils/compacted fill during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade and underlying natural soils/compacted fill, including restricting the use of certain types of construction equipment and their movement

over sensitive or unstable materials. The Contractor shall coordinate with the Architect or Soils Representative to modify his operations as necessary to minimize disturbance and protect bearing soils, based on the Architect's or Soils Representative's observations.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with compacted approved material in accordance with this Specifications. Fill that cannot be compacted within 48 hours because of its saturated condition shall be removed and replaced with compacted approved material in accordance with this Specifications. Costs of removal of disturbed material and replacement with approved material shall be borne by the Contractor.

C. If requested by the Architect or Geotechnical Engineer, the Contractor shall place a six-inch layer of Crushed Stone or 12-inch layer of Granular Fill/Structural Fill over natural underlying soil to stabilize areas disturbed during construction.

1. The placement of the Crushed Stone layer or Granular Fill/Structural Fill as well as material costs shall be borne by the Contractor. A geotextile fabric shall be used to separate the crushed stone from the natural soil and from the overlying fill when directed by the Geotechnical Engineer at no additional cost to the owner at no extra cost to the owner.

D. Material that is above or below optimum moisture for compaction of the particular material in place as determined by the Architect or the Soils Representative and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall be classified as unsuitable bearing materials. This material shall be removed and replaced with lean concrete, suitable/approved backfill material, or crushed stone as directed by the Geotechnical Engineer or Soils Representative at no additional cost to the Owner.

1.16 SPECIAL REQUIREMENTS FOR SEQUENCE OF CONSTRUCTION OPERATIONS AND DRAINAGE AND EROSION CONTROL

A. An initial procedure for sequencing of construction operations is specified under Section 31 25 00, Erosion and Sedimentation Controls. This procedure shall be extended through earthwork operations as follows:

1. Perform initial procedures as specified under Section 31 25 00, Erosion and Sedimentation Controls – Initial Sequence of Construction Activities and Preliminary Drainage Control.
2. Repair any broken or damaged Sections of the haybales or siltation fencing installed during site preparation and install any additional Sections necessary for proper erosion control.
3. Throughout earthwork operations, in addition to drainage swales, check dams, siltation sumps, and other items shown on the Drawings, the Contractor shall take other necessary precautions, including installation of temporary drainage swales, siltation sumps, check dams, haybales, silt fencing and temporary pipe to direct and control drainage from disturbed areas on the site so that erosion and siltation is minimal. In addition, no erosion or discharge of silt or larger particles shall occur in water bodies or wetland areas to remain undisturbed or onto adjacent properties.

4. Damaged or loose haybales and siltation fence shall be replaced as necessary to maintain their function of controlled erosion and siltation. Damaged or broken down check dams and filtration dams shall be replaced immediately.
5. Throughout construction, remove any accumulation of silt or soil build-up behind haybales, silt fences, check dams and filtration dams as it occurs. Remove accumulations of silt and build-up from the siltation pumps and silt traps when it is approximately 18 inches deep, or when it adversely affects the performance of the system. Remove silt sacks in catch basins when they have become clogged and replace to maintain their function.
6. Replace the crushed stone on the inside of all siltation sumps as necessary to permit adequate flow through the media and to maintain their function as a filter of silt and larger particles. Excavate silt and other material from the basins of all siltation sumps as it accumulates.
7. Remove temporary drainage swales, check dams, siltation sumps, haybales and other temporary drainage, erosion and siltation control measures when permanent drainage control measures have been installed, and grass is established in drainage areas and lawn areas. Do not remove the above items without approval of the Architect. If, in the Architect's opinion, these measures are still necessary, they shall stay in place.

1.17 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the grade and hot-mix asphalt paving.

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. Imported fill shall meet the gradation requirements set forth in PART 2 - PRODUCTS.

E. Building Area: The area defined by the projection of a line from two foot outside of the edge of the footing extending upward and outward at a slope of 1.5H: 1V. (If over-excavation is required below the footing the building area will be redefined from the bottom of over-excavation).

F. Compaction: The tamping and rolling of all backfill placed in uniform horizontal layers not exceeding a defined uncompacted lift thickness.

G. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

H. Deleterious Material: Trash, debris, clay, topsoil, roots, organic material friable, glass, material that has become soft and saturated, even if previously compacted, material defined in section 1.17.X, or otherwise degradable materials that compromise the strength and properties of soils.

I. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated. Excavation is unclassified.

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.
2. 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.

J. Fill: Soil materials used to raise existing grades or meet proposed grades.

K. Frost Zone: The area within 4 feet of finished grade.

L. Influence Zone/Area: The area below a footing defined by the projection of a line from two feet outside of either edge of the footing extending downward and outward at a slope of 1V:1H.

M. “In-the-dry”: In-situ soil moisture content of no more than two percentage points above the optimum moisture content for that soil.

N. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density for relative compaction.

O. Prepared Ground Surface: The ground surface after clearing, grubbing, stripping, excavation, and scarification and/or compaction.

P. Proof-rolling: The tamping and rolling of all subgrades including running a loaded rubber tire truck over the subgrade when requested by the Geotechnical Engineer.

Q. Relative Density: As defined by ASTM D4253 or D4254.

R. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557. Corrections for oversized material shall be applied to maximum dry density.

S. State Standards: RI Department of Transportation Standard Specifications for Highways and Bridges.

T. Structures: Buildings, footings, foundations of any type, retaining walls, buildings and equipment slabs, ramps, stairs, tanks, curbs, sidewalks, mechanical and electrical appurtenances, retaining walls, or other man-made stationary features constructed above or below the ground surface.

U. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

V. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

W. Unclassified Excavation: The nature of materials to be encountered has not been identified or described herein.

X. Unsuitable material shall be material having at least one of the following properties:

1. Material with a maximum unit dry weight per cubic foot less than 110 lbs., as determined by ASTM D1557.
2. Material containing greater than 2% organic matter by weight, topsoil, organic silt, peat, construction debris, roots and stumps.
3. Material which has a Liquid Limit greater than 55 when tested in accordance with ASTM D 4318.
4. Materials that do not meet one of the gradation specifications in this section.
5. Wet material which cannot be compacted due to moisture contents outside of the limits of ±2 percentage points of optimum moisture content.
6. Material classified as unsuitable by the Geotechnical Engineer.
7. Unsuitable material shall be disposed of off-site as directed by the Architect.
8. Material processed onsite that is not well graded or contains excess stones and exhibits honeycombing when placed in lifts.
9. Materials that are unstable as a result of inadequate construction dewatering, excessive subgrade disturbance, or other means and methods used by the Contractor are not considered unsuitable materials This include materials that were stable and that have become unstable.

Y. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

Z. Trench: An excavation of any length where the width is less than twice the depth and where the shortest distance between payment lines does not exceed ten (10') feet. All other excavations shall be defined as open excavations.

AA. Architect: Where architect is referenced it shall mean the Architect or the Architect's representative.

BB. Geotechnical Engineer: Where Geotechnical Engineer is referenced it shall mean the Geotechnical Engineer or its representative.

CC. The base layer of athletic fields shall mean the surface layer(s) required for the grass and/or athletic fields as designed by the project Civil Engineer or Landscape Architect.

1.18 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements govern.

B. American Society for Testing and Materials (ASTM):

1. ASTM D1556, Density of Soil In Place by the Sand-Cone Method.
2. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
4. ASTM D422, Particle Size Analysis of Soils.

C. State of Rhode Island:
   1. Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction.
   2. The Rhode Island State Building Code.
   3. Rhode Island Stormwater Design and Installation Manual.
   4. Rhode Island Erosion and Sediment Control Handbook.

D. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO T-11, Standard Method of Test for Amount of Material Finer than 0.075 mm sieve in aggregate.
   2. AASHTO T-27, Standard Method of test for sieve analysis of fine and coarse aggregates.

E. Occupational Safety and Health Act of 1970 (Public Law 91-596 of the United States, 29 USC Section 651 et seq.).

1.19 SUBMITTALS

A. Product Data: For the following:
   1. Each type of plastic warning tape.
   2. Geotextile – The contractor shall submit a 12” by 12” sample of geotextiles.
   3. Controlled low-strength material, including design mixture.

B. Submit a detailed construction sequence plan for project excavation indicating temporary stockpile areas, side slopes of excavations, limits of required temporary excavation support and sequence and procedures for subgrade protection, excavation, concrete placement, moisture conditioning of on-site excavated soils used as fill, filling, backfill, ~~and~~ compaction**, and coordination of work with ground improvements**. **[ADD #6]**

C. The Contractor shall submit, the name of imported material suppliers. Change of source suppliers shall require approval from the Architect.

D. Grain-size distribution analysis test data shall be delivered with the samples. The analysis shall be performed in accordance with ASTM D 422. The data shall include a plot of the gradation and the envelope of the specified material. A material shall be considered meeting the specifications when its gradation curve fits entirely within the specified envelope. Borrow soil materials with grain-size distribution curves that do not fall entirely within the specified envelope shall be deemed unacceptable.

E. The Contractor shall submit to the Architect, under provisions of Section 01 33 00, manufacturer’s literature, and data on proposed compaction equipment.

F. The Contractor shall provide to the Architect, on a daily basis, copies of field records documenting the location of stockpiled material, and stockpile identification data.

G. The Contractor shall submit a scale plan daily that defines the location, limits, and depths of the area excavated.

H. 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 onsite and borrow soil material proposed for fill and backfill.
2. Recent (less than one month old) Gradation Curve (ASTM-D422) and Laboratory compaction curve according to ASTM D 1557 for each on-site and borrow soil material proposed for fill and backfill.

I. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins

J. Excavation and Excavation Support Plan: Submit at least 10 calendar days prior to the start of the work a detailed plan for the sequence of excavation, and methods to be used for excavation support and dewatering of excavations if required. Submit engineering calculation stamped by a Rhode Island Registered Professional Engineer and shop drawings for earth support systems to be used.

K. Dewatering plan shall be submitted at least 10 days before the start of construction. Dewatering and groundwater control systems shall be designed to keep excavations free of water and to avoid disturbance of the subgrade in accordance with Section 1.13 of these Specifications. The dewatering submittal shall include locations, depth, and size of deep sump pumps**. The dewatering submittal shall also include details about disposal of groundwater collected by the dewatering system**. **The dewatering submittal shall be designed by a Rhode Island Registered Professional Engineer. The submittal shall include: [ADD #6]**

1. Drawings and supporting engineering calculations for the proposed surface water control, dewatering systems, sediment control tanks, bag filters, and pH neutralization systems and treatment systems (if applicable), including their relation to water disposal points. [ADD #6]
2. Shop drawings showing proposed types and details of dewatering systems to be used. The submittal shall include the arrangements, locations and depths of the proposed systems, a complete description of equipment and materials to be used and the procedure to be followed in installation, primary power source, operation, maintenance and removal in relation to the proposed sequence of excavation, foundation construction and backfilling; the standby equipment and standby power supply; and the proposed locations of points of discharge of water and their relationship to sediment control facilities
3. Design calculations demonstrating the adequacy of the proposed systems and equipment. [ADD #6]
4. Plan locations of proposed surface water control and discharge systems. [ADD #6]

1.20 SAMPLING AND TESTING

A. The contractor shall submit 50-lbs samples of each type of fill material, in air-tight containers, proposed for use on-site in accordance with PART 2 - PRODUCTS, to the Owner's Geotechnical Engineer (Geotechnical Consultant) for **preliminary compliance testing** at least two (2) weeks prior to use. No fill material shall be delivered to the site or placed until the material has been approved. The final

review of the material will be based on the re-tested sample by the owner's testing agency upon delivery of the material to the site. The gradation curves shall fit entirely within the envelopes defined by the limits specified herein for the material to be approved for use at the site.

1. Samples shall be delivered to the office of the Architect or as directed.
2. Samples required in connection with compaction tests will be taken and transported by the Soils Representative.
3. Additional tests, including grain-size analyses and laboratory compaction tests shall be performed on the material after it is delivered to the site.
4. For on-site materials, submit representative samples, collected from each stockpile of excavated on-site material to be used, directly to the Owner's Geotechnical Consultant's office at least two (2) weeks in advance of use of these materials.

B. Product Data: Submit location of pits for borrow material. Samples shall include name of source, name of material, sampling date, and intended use.

C. Samples shall be representative of the source pit. If materials are found to vary once construction begins, the Contractor will be required to submit additional representative samples at his own cost.

D. Compaction tests:
1. Compaction tests shall be performed at all bench and other site fixture pads.
2. Compaction tests shall be performed on each lift of placed and compacted material. Accordingly, it is the responsibility of the Contractor to provide ample notice to the testing agency to provide a field representative to perform field density tests.

E. Materials imported to the site by the Contractor for on-site use shall not contain oil, hazardous waste, or deleterious materials.
1. The Contractor shall be responsible for all costs incurred by the Owner as a result of the Contractor's action to import materials containing concentrations of oil and/or hazardous materials to the site.
2. In the event that site characterization of off-site borrow sources indicates that soils are acceptable to the Architect or Engineer for use, then chemical testing will not be required. It is anticipated that chemical testing would not normally be required for material from customarily utilized commercial borrow sources No fill material from "urban areas" will be accepted for fill at the site, even if chemical testing indicates no exceedances of "Reportable Concentrations". If requested by the Owner or Engineer, based on review of the borrow site characterization, the Contractor shall conduct testing on proposed fill material and submit results prior to delivery to the site, at no additional cost to the Owner. Testing shall be conducted by a Rhode Island certified testing laboratory and shall include, at a minimum, the following analytical test data.
   a. Total Petroleum Hydrocarbons (EPA Method 418.1) every 100 yards
   b. Volatile Organic Compounds (EPA Method 8420) every 500 yards
   c. PCB and Pesticides (EPA Method 8080) every 500 yards
   d. Total RCRA Metals (EPA Method 6000-7000 series) every 500 yards

e. Polynuclear Aromatic Hydrocarbons (EPA Method 8270) every 500 yards

f. TCLP for those total parameters which exceed twenty times the TCP criteria every 500 yards

g. Total cyanide (EPA 9020)

3. Testing parameters and testing frequencies may be reduced, as directed by the Soils Representative.

4. All sieve analyses for conformance of on-site and off-site fill materials to be used in the work shall be done by means of a mechanical wet sieve analysis and in accordance with ASTM D 422.

1.21 QUALITY ASSURANCE

A. The Engineer's duties do not include the supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the contractor from defects discovered in his Work at that time or subsequent to the testing.

B. Subgrades shall be observed and approved by the geotechnical engineer before placing fill. The compaction and material composition shall be approved by the geotechnical engineer before placement. The by the Architect and/or Geotechnical Engineer prior to placing subsequent lifts. If inspections indicate subgrade does not meet specified requirements, the unsuitable subgrade shall be excavated, the unsuitable material shall be removed, and replaced with approved backfill material and compacted at no additional cost to the owner or architect. The work shall be done in accordance with this specification.

C. Costs related to retesting due to unacceptable quality of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

a. The Soils Representative's presence or the Geotechnical Engineer does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Soils Representative, nor any observations and testing performed by him, nor any notice or failure to give notice shall excuse the Contractor from defects discovered in his work.

b. The Owner reserves the right to modify the services of the Soils Representative or Geotechnical engineer.

A. The contractor shall make provisions for allowing safe and timely observations and testing of Contractor's Work by the Geotechnical Engineer and by the Soils Representative. The presence of the independent testing agency and/or the Geotechnical Engineer does not include supervision or direction of the actual work of the Contractor, his employees or agents. Neither the presence of the Soils Representative and/or the Geotechnical Engineer, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

B. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, Soils Representative, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

C. Testing: Compaction tests will be required by the Owner and will be paid for by the owner. No specific testing schedule has been established at this time. If tests indicate that density requirement have not been achieved, the contractor continue compacting the tested material. All retesting is these areas shall be paid for by the contractor.

D. The Owner's Testing Agency will perform water content, gradation tests on onsite and processed materials, and compaction tests at a frequency and at locations as required. The results of these tests will be submitted to the Architect, and a copy submitted to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy the indicated deficiencies.

E. Contractor shall notify Architect when excavations have reached required subgrade and provide a minimum notice of 24 hours prior to placement of backfill on exposed subgrade. Density and Compaction Testing: The contractor is responsible to schedule compaction tests and allow adequate time for the proper execution of said tests. **This section also applies to instances when the General Contractor resumes earthwork operations after a period of pause in earthwork operations that require observations by the Geotechnical Engineer.**

F. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services, as necessary:

~~1. Prepare plan report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.~~ **[ADD #6]**

~~2.~~**1.** Seismographic monitoring services during blasting operations.

~~3.~~**2.** Prepare a preblast survey of all adjacent properties, including a structural inspection of the buildings and properties and shall include a written and photographic record of existing conditions.

~~4.~~**3.** Blast operations shall not commence until all reports and plans are received and approved by the Owner and the Architect.

1.22 PROJECTS AND CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the 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 a utility-locator service for the area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility agencies and the City of Central Falls to shut off services if lines are active.

C. All fill to be removed from the Building Area and Influence Zone as presented on the plans and described herein.

D. Subsurface investigations indicated the presence of sandy materials which will likely be easily disturbed due to construction activities. This material is also likely to require regular moisture conditioning to obtain required compaction requirements.

E. Work under this section shall include the removal of 40 cubic yards of un-anticipated rock ledge or solid masonry or concrete foundations in mass or trench excavations, or boulders over **three (3)**~~two (2)~~ cubic yards in open excavations and over one (1) cubic yard in size in trenches. Such removals shall be measured by the Landscape Architect/Engineer by notifying the Landscape Architect/Engineer prior to removal. If not performed, credits to the extent of material removal deducted from the 40 cubic yards in the measurements shall be applied to the contract price. The contract price shall be reduced by the extent of the work not undertaken as called for in this section. **[ADD #6]**

1.23 MEASUREMENT

A. Measurement of Unsuitable Soil over excavation:

1. Strip vegetation, topsoil, subsoil, buried organic material and fill to a minimum depth of 1 foot below the existing grades in accordance with the Contract Documents or in accordance with Drawings. Remove existing asphalt, curbing, and structures.
2. Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils~~ throughout the building footprint~~. Excavation shall be surveyed at each corner, at highs and lows. The maximum spacing for survey points is 20 feet in each direction on a grid. **[ADD #6]**
3. Remove unsuitable soils as shown on the Contract Documents or as directed in the field by the Owner's Geotechnical Consultant.
4. ~~Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils throughout the building footprint. Excavations shall be surveyed at the corners, high and low points, and a maximum spacing for survey points of 20 feet in each direction on a grid.~~ **[ADD #6]**
5. **4.** The results of the surveys are to be plotted on an AutoCAD drawing showing the bottom of subsoil grades, the bottom of proposed subgrade including the zones of influence and bottom of unsuitable soils. The volume of over-excavated unsuitable soil removal is to be calculated by a Registered Land Surveyor. Submit volume calculations of over-excavated unsuitable soils and all survey information to the Architect for review. Submission must include raw survey data, AutoCAD bottom of subsoil surface, AutoCAD bottom of proposed subgrade including the zones of influence AutoCAD bottom of unsuitable soils surface, and volume calculations in a spreadsheet (electronic format).
6. **5.** Quantities shall be measured in their original position to the limits of clearly defined vertical construction lines and to the depth required for the defined

construction. Payment will be at the Contract Unit Prices. **No payment shall be made to quantities not measured as described herein. [ADD #6]**

PART 2 - PRODUCTS

2.1 GENERAL

A. Segregate excavated material based upon material type to enable reuse in appropriate locations based upon material type as described in Section 3.5.

B. Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

2.2 SOIL MATERIALS

A. Use of materials shall be as described below and as shown in the Drawings.

B. Fill material will not be accepted from off-site borrow sources that are RIDEM disposal sites. Common borrow material obtained from off-site borrow sources that have no known releases or disposal of oil and/or hazardous material shall be acceptable for use only when accompanied by documentation stating there has been no known releases or disposal of oil and/or hazardous materials at the off-site borrow site.

C. Fill material shall be free from frost/ice and snow, rocks with a diameter greater than 2/3 of the loose lift thickness as specified herein, and foreign matter, such as construction debris, asphalt, trash, wood, roots, leaves, sod, and organic matter. All fill material shall be maintained by the contractor at suitable moisture contents for proper placement and compaction as specified herein

D. Offsite pulverized pavement and crushed concrete are not acceptable for fill material except as specified herein.

2.3 STRUCTURAL FILL

A. Structural Fill shall have a plasticity index of less than 6 and shall meet the gradation requirements shown below. Structural Fill shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
3 inches	100
1 ½ inch	80 – 100
½ inch	50 – 100
No. 4	30 – 85
No. 20	15 – 60
No. 60	5 – 35
No. 200*	0 - 10

*0 – 5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

Use structural fill within building areas beneath floor footings and slabs, retaining wall foundations, and in other soil-bearing situations.

Crushed concrete can be used as Structural Fill provided it meets the requirements of these specifications. If used, the crushed concrete shall be used up to 6 inches below the bottom of footings and 12 inches below the bottom of slabs.

2.4 ORDINARY FILL

A. Ordinary Fill shall have a plasticity index of less than 6 and shall meet the gradation requirements shown below. Ordinary Fill shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture content s within ±2 percentage points of optimum moisture content.

Sieve Size	Percent Passing by Weight
6 inches	100
1 inch	50 – 100
No. 4	20 - 100
No. 20	10 - 70
No. 60	5 – 45
No. 200	0 - 20

Use Ordinary Fill for general grading; as backfill for embankments, behind the free draining backfill behind retaining walls, landscape areas, and athletic fields.

Crushed concrete can be used as Ordinary Fill provided it meet the requirements set forth by this specification **an except where a material more permeable than crushed concrete is required for drainage purposes**. **[ADD #6]**

Based on grain-size analyses, the existing fill free of organic matter may be used as Ordinary Fill. Existing on-site soils shall not be reused under foundations, paved surfaces, sidewalks, exterior slabs, pads, and walkways.

2.5 COMMON BORROW

A. Common Borrow material shall be soil containing no stone larger than 8 inches and shall be substantially free of organic loam, wood, trash, or other objectionable materials which may be decomposable, compressible or which cannot be properly compacted. Common Borrow materials shall not contain more than 30 percent by weight of silt and clay.

1. No Common Borrow shall be imported until available onsite Ordinary Fill has been utilized or with prior written approval from the Architect.
2. Common Borrow material from off-site borrow sources shall contain no detectable concentrations of asbestos.
3. Common Borrow to be placed within 12 inches of athletic fields shall be soil containing no stone larger than 3 inches and shall meet all other requirements listed herein.
4. Crushed concrete shall not be used as Common Borrow.

2.6 GRAVEL BORROW

A. Bank Run Processed Sand/Gravel shall be onsite or imported material conforming to Item M.01.02, type 1a of the State Standards.

B. Reclaimed Processed Material shall be onsite or imported material conforming to Item M.01.02, type 2a of the State Standards.

C. Gravel Borrow may be anticipated to be onsite in limited quantities.

D. Crushed concrete shall not be used as Gravel Borrow.

2.7 BEDDING MATERIAL

A. Gravel Borrow Bedding Material shall be imported material conforming to Item M.01.04 State Standards.

B. Crushed Stone Bedding Material shall be imported material conforming to Item M.01.04 of the State Standards.

2.8 SAND FILL

A. Sand Fill: To be used as utility bedding and backfill. It shall be hard, durable sand free from ice, snow, roots, sod and other deleterious matter The allowable amount of material passing a No. 200 sieve as determined by AASHTO T11 shall not exceed 10% by mass. The Sand Fill shall be used as backfilling material around banks of pipes. The Sand Fill shall be graded within the following limits:

Sieve Size	% Passing by Weight
3/8-inch	100
No.200	0-10

2.9 DENSE GRADED CRUSHED STONE FOR SUBBAASE

A. Dense graded Crushed Stone for subbase shall be imported material conforming to Item M.01.09, Type II of the State Standards.

B. Crushed concrete cannot be used as Dense Graded Crushed Stone for Subbase.

C. Dense graded Crushed Stone for subbase are not anticipated to be present onsite.

2.10 CRUSHED STONE

A. Crushed Stone shall be impacted durable material with maximum of 1 ½ ” or 2” as specified in the Drawings. Stone used for drainage components shall be double washed. For all other applications fines shall be <1% unless otherwise noted. Crushed stone shall meet the following gradation:

Size (inches)	Percent Finer
1 ½” – 2”	100%
1 ¼”	85% - 100%
¾”	10% - 40%
½”	0% - 8%
#200	< 1%

2.11 PEA GRAVEL

A. Clean naturally rounded aggregate with particle sizes no larger than 3/4 of an inch with no more than 5% passing the #8 sieve. The dry density shall be a minimum of 95 pounds per cubic foot.

2.12 WASHED STONE

A. Washed stone shall be free from shale, clay, organic materials, and debris with stone sizes conforming to No. 4 stone as specified by ASTM D448. Not more than 0.5 percent of satisfactory material passing a No. 200 sieve shall be allowed to adhere to the stone. Laboratory testing shall be completed in compliance with ASTM D6913, and results shall be submitted to the **Civil Engineer** for approval.

2.13 FILTER FABRIC

A. Filter fabric shall be nonwoven, needle-punched geotextile, manufactured for subsurface drainage applications, made from polypropylene fibers with elongation greater than 50 percent and complying with AASHTO M288. Filter fabric shall consist of Mirafi 140N, US120NW, GeoTex 401, or approved equal.

B. High Visibility Filter Fabric shall consist of US 160NW-HVO non-woven orange filter fabric, GeoTex 601OR, or Mirafi 160N/O, or approved equal.

2.14 GEOTEXTILE FABRIC

A. Geotextile No. 1: Geotextile Fabric for erosion control/slope protection shall conform to the State Standards. Geotextile No. 1 is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that fibers retain their relative position. The product is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	**Test Method**	**Unit**	**Minimum Average Roll Value**
Grab Tensile Strength	ASTM D 4632-91	lbs	120
Grab Tensile Elongation	ASTM D 4632-91	%	50
Trapezoid Tear Strength	ASTM D 4533-91	lbs	50
Mullen Burst Strength	ASTM D 3786-87	psi	225
Puncture Strength	ASTM D 4833-00	lbs	65
Apparent Opening Size (AOS)	ASTM D 4751-99A	U.S. Sieve	70
Permittivity	ASTM D 4491-99A	sec^{-1}	1.8
Permeability	ASTM D 4491-99A	sec	0.21
Flow Rate	ASTM D 4491-99A	gal/min/ft	135

Mechanical Properties	**Test Method**	**Unit**	**Minimum Average Roll Value**
UV Resistance (at 500 hours)	ASTM D 4355-02	% strength retained	70

Physical Properties	**Test Method**	**Unit**	**Typical Value**
Weight	ASTM D 5261-92	oz/yd	4.8
Thickness	ASTM D 5199-01	mils	55
Roll Dimensions (width x length)	--	ft	12.5 x 360 / 15 x 360
Roll Area	--	yd	500 / 600
Estimated Roll Weight	--	lb	164 / 197

B. Geotextile No. 2: Geotextile No. 2 is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that fibers retain their relative position. The product is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	**Test Method**	**Unit**	**Minimum Average Roll Value**
Grab Tensile Strength	ASTM D 4632	lbs	160
Grab Tensile Elongation	ASTM D 4632	%	50
Trapezoid Tear Strength	ASTM D 4533	lbs	60
Mullen Burst Strength	ASTM D 3786	psi	305
Puncture Strength	ASTM D 4833	lbs	95
Apparent Opening Size (AOS)	ASTM D 4751	U.S. Sieve	70
Permittivity	ASTM D 4491	sec^{-1}	1.4
Permeability	ASTM D 4491	sec	0.22
Flow Rate	ASTM D 4491	gal/min/ft	110
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70

C. Geotextile No. 3: Geotextile for the installation of underground tank

1. Woven geotextile fabric with a minimum grab tensile strength of 120 lbs/inch and a maximum apparent opening size of #50 US sieve (0.300 mm)

D. A geotextile fabric shall not be used between crushed stone and soil fill material at the base of retaining walls. Where separation between crushed stone and soil fill material is required, the crushed stone shall be choked by means of a soil filter.

2.15 OTHER SOIL MATERIAL

A. Drainage Aggregate: Narrowly graded mixture of washed crushed stone or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

B. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

C. Fine Aggregate: ASTM C 33; fine aggregate, natural, or manufactured sand.

D. River Stone: River stone shall be 1 ½" to 3" rounded and 3" to 6" rounded and oval, smooth stone, color range shall be warm tones of buff, beige, tan and gray. Color range shall be consistent throughout. Stone shall be clean and washed free of deleterious material. Contractor to submit 5-gallon container sample for each size range with source indicated.

E. Rip-rap: rip-rap shall be sound, durable rock which is angular in shape in accordance with the State Specifications.

2.16 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) 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 (750 mm) 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.

PART 3 - EXECUTION

3.1 GENERAL

A. Prior to commencing work, the Contractor shall establish property line locations and place construction control markers clearly visible and understandable to workers in the field. The Contractor shall exercise due care so as not to disturb adjacent structures and shall leave the Site in clean and orderly condition upon completion of the work.

B. Unanticipated Soil Conditions:

1. Removal of unsuitable materials up to the depths shown in the geotechnical report shall be part of the base bid and shall not be considered an unanticipated soil condition. The depth to the bottom of unsuitable material shall be estimated by interpolating between the depths to unsuitable material in the nearest borings and/or test pit.
2. If unsuitable bearing materials are encountered ~~at the specified subgrade depths, i.e.,~~ deeper than the elevations shown in the Geotechnical Report, the Contractor shall notify the Architect. The Contractor shall carry excavation deeper and replace the excavated material with suitable/approved compacted fill or lean concrete as directed by the Architect or geotechnical engineer. **[ADD #6]**
3. Removal of such material and its replacement as directed will be paid an extra compensation in quantity approved by the Architect and calculated using survey points of the excavated area. Only changes in the work authorize in advance by the Architect in writing shall constitute an adjustment in the Contract Price.
4. Material that is above or below optimum moisture for compaction of the particular material in place as determined by the Architect or the Soils Representative and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall not be construed as unsuitable bearing materials. This material shall be removed and replaced with lean concrete or with approved material as directed by the Architect or Geotechnical Engineer or Soils Representative at no additional cost to the Owner.
5. The Contractor shall follow a construction procedure which permits visual identification of firm natural ground.

C. Excessive Excavation: If any part of the general or trench excavation is carried, through error, beyond the depth and dimensions indicated on the Drawings or called for in the Specifications, the Contractor at his own expense, shall furnish and install compacted gravel fill, concrete, or take other remedial measures as directed by the Architect to bring fill material up to the required level or dimension.

D. The Contractor shall reuse on-site all on-site excavated soils that meet the gradation requirements of materials specified herein. Solid waste consisting of brick, concrete, asphalt, cobbles, boulders, and all unsuitable excavated materials shall become the property of the Contractor and be legally disposed of off-site at no additional cost to the Owner.

Samples and Testing:

1. Excavated material taken directly from on-site cuts that will meet the Specifications may be used as fill provided the Contractor obtains written approval from the Architect. No such fill material shall be put in place until approved for use by the Architect in writing and until test results, including gradation and compaction tests are approved by the Geotechnical Engineer.
2. Testing of materials as delivered may be made from time to time. Materials in question may not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace with new, whether in stockpiles or in place.
3. The existing fill and the natural soil may contain high fines contents. Such soils are very susceptible to disturbance when exposed to moisture. Care shall be exercised during construction to maintain a dry working subgrade. Provide working mats, e. g., crushed stone or concrete mud mats, to reduce the potential for disturbance of the foundation subgrade and to improve working conditions. The use of crushed stone to stabilize soft subgrade shall be at no additional cost to the Owner.

E. Deficiency of Fill Material: Provide required additional fill material to complete the work if a sufficient quantity of suitable material is not available from the required excavation on the project site at no additional cost to the Owner.

F. Surplus Fill Material: Surplus fill that is not required to fulfill the requirements of the Contract shall be removed from the site and legally disposed of at no additional cost to the Owner.

G. Protect all benchmarks, monuments, and property boundary pins. Replace if destroyed by contractor's operation.

3.2 PREPARATION

A. The Contractor shall be deemed to have inspected the Site and satisfied himself/herself as to actual grades and levels and true conditions under which the Work will be performed.

B. Where the excavation for footings, utilities, or pre-trenching damages ground improvements, the ground improvements shall be repaired per the installer's specifications at no additional cost to the Owner. [ADD #6]

~~B.~~**C.** Areas required for execution of Work shall be cleared. The work area shall be free of standing water and shall be dry.

~~C.~~**D.** All site health and safety controls shall be fully established and in operation prior to beginning any demolition, soil, and fill excavation. Site controls shall include but not be limited to work zones properly barricaded, wheel wash and decontamination facilities, and all support equipment and supplies including personal protective equipment. All site controls shall be reviewed by the Architect in the field.

~~D.~~**E.** The Contractor shall provide all layout field data, including ties, to the Architect. The Contractor shall maintain all required field controls throughout the performance of the Work.

~~E.~~**F.** Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

~~F.~~ **G.** Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 31 10 00 Site and Preparation Clearing."

~~G.~~ **H.** Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section 31 25 00 – Erosion and Sedimentation Controls.

~~H.~~ **I.** Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.3 SUBGRADE PREPARATION

A. The ~~surficial~~ topsoil, subsoil, if any, **and other surficial organic soil,** asphalt, and other deleterious matter should be entirely removed from within the proposed building footprint before the start of foundation work. **[ADD #6]**

B. Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per this Specification and the Geotechnical Report.

C. Cobbles and boulders should be removed at least 6 inches from beneath footings, and 24 inches beneath the bottom of proposed slab and paved areas. The resulting excavations should be backfilled with compacted Structural Fill under the building and with Ordinary Fill under the subbase of paved areas.

D. Due to the high susceptibility of the natural soil for disturbance under foot and vehicular traffic, the Contractor shall place a minimum of 6 inches of Structural Fill at the bottom of the excavation or 4 inches of lean concrete to serve as a working mat.

E. The base of the footing excavations in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade before placing the required 6 inches of Structural Fill.

F. The subgrade of the slab should be compacted using a vibratory roller compactor imparting a minimum of 40 kips of force to the subgrade before placing Structural Fill.

G. Where soft zones are revealed during the preparation of the subgrade, the soft materials or buried organic soil should be removed and replaced with Structural Fill within the building footprint and with Ordinary Fill beneath the subbase of paved areas.

H. To reduce the potential of increasing lateral pressures on any retaining walls, fill placed within 3 feet of the walls, if any, should be compacted using a small plate compactor imparting a maximum dynamic effort of 4 kips. The fill within 3 feet of the walls should be placed in maximum 8-inch loose lifts.

I. Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill as described in this Specification.

J. Fill placed in the top 12 inches beneath sidewalks and exterior slabs should consist of Structural Fill with less than 5 percent fines.

K. When crushed stone is required in the drawings or it is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation. The geotextile fabric should not be used under retaining walls as it promotes a plane of sliding.

L. In areas requiring rock excavations, if encountered, disturbed rock material shall be removed and replaced with Structural Fill or crushed stone within the footprint of the proposed building, and with Ordinary Fill beneath the pavement subbase of the proposed parking lots and driveways.

M. Granular fill shall not be placed directly on rock surfaces containing voids. Suitably sized crushed stone or a geotextile for separation shall be placed on the fractured surface prior to placing the fill to limit migration of smaller particles into the voids.

N. Under utility pipes, manholes, and catch basins, rock shall be cut a minimum of 12 inches beneath the pipe or structure.

O. Laterally, the rock shall be removed at least 1 foot beyond the limits of footings and 3 feet beyond the limits of walls. Rock shall be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.

P. All excavated materials shall be segregated such that reusable material meeting the gradations provided for above are separated from organics and all other deleterious material.

Q. Once the final subgrade has been reached, and upon acceptance by the Architect and Soils Representative, Contractor shall backfill the excavated area with Structural Fill in the influence zone of building areas and Ordinary Fill in paved areas. Limits of excavation shall be determined in the field based upon observed conditions.

3.4 SUBGRADE PREPARATION FOR PAVED AREAS, SIDEWALKS, AND EXTERIOR PADS

A. Topsoil, root balls, and other deleterious material should be entirely removed from within the paved areas and under sidewalks.

B. After the surficial topsoil is entirely removed from within the proposed paved areas and under sidewalks, the exposed existing fill should be improved by compacting the exposed surface with at least six (6) overlapping passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil are observed, the soft soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer.

C. Fill placed under the subbase of paved areas and sidewalks should meet the gradation and compaction requirements of Ordinary Fill.

D. The subbase of paved areas should conform to the recommendations in this specification.

E. The subbase of sidewalks should consist of Structural Fill with less than 5 percent fines.

3.5 PROOF COMPACTING

A. Areas requiring excavation shall be excavated to subgrade and then proof compacted as specified in Section 1.2 of this Specification Section.

B. Where soft zones are revealed by compaction efforts and where organic soil is exposed, the soft material or organic soil shall be removed and replaced with Structural Fill in the influence zone of building areas and utility trenches and Ordinary Fill in paved areas.

3.6 REUSE OF ONSITE MATERIALS AND PROCESSING OF ONSITE MATERIALS

A. Organic soils cannot be reused for backfill except as directed by the landscape architect.

B. Based on the Geotechnical Engineer's field observations and the results of the grain-size analyses, some of the onsite fill free of organic matter may be used as Ordinary Fill and may be improved by blending with crushed stone to use as Structural Fill.

C. The Contractor should avoid mixing the reusable soils with fine-grained and/or organic soils. The soils to be reused should be excavated and stockpiled separately for compliance testing. Soils with 20 percent or greater fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during the compaction of onsite soils with fines contents of 20 percent or greater. The Contractor should be prepared to remove and replace such soils if pumping occurs.

D. Solid waste consisting of brick, concrete, asphalt, cobbles and boulders that measure less than 3 cubic yards in volume shall become the property of the Contractor and be legally disposed of off-site at no additional cost to the Owner.

E. Excavated onsite soils which are suitable for re-use at the time of excavation but become frozen or too wet for re-use due to poor material handling practices shall be disposed of off-site and replaced as necessary at no additional cost to the Owner.

F. The Contractor must inspect all existing stockpiles on site including soil testing for each stockpiled material.

G. The Contractor must amend the existing stockpiles if testing determines that the stockpiles do not meet the specifications for their intended use. The Contractor shall provide third party sampling and testing for all soils amended on-site.

H. The contractor shall protect stockpiled unprocessed materials from exposure to moisture using tarps. The tarps shall be secured so as not to be moved by wind or other action. No claim shall be made, by the contractor, due to failure to comply with this requirement.

I. The reuse of onsite soil shall not be permitted within one foot of finished grade.

3.7 EXCAVATION, GENERAL

A. The Contractor shall remain responsible for adequacy and safety of construction means, methods and techniques.

B. The Contractor shall complete all excavations regardless of the type, nature or condition of the material encountered. The Contractor shall be solely responsible for making all excavations in a safe manner.

C. The Architect shall be notified of unexpected subsurface conditions. Work shall be discontinued in affected areas until notified to resume work by the Architect.

D. Displaced or loose soil shall be prevented from falling into any excavation. The stability of soil slopes shall be maintained in accordance with applicable local, state and federal regulations and guidelines.

E. All loose material shall be removed from the bottom of the excavation so that the bottom shall be in an undisturbed condition. If removal of the loose material results in excavation beyond the work limits and over excavation has not been approved by the Architect; the restoration of the excavation to grade shall be done at no additional cost to the Architect.

F. When the bottom of the excavation shall, by error of the Contractor, have been taken to a depth greater than the depth specified, or directed by the Architect, said condition shall be corrected by refilling to the proper grade with granular fill or the design shall be altered in a fashion acceptable to the Architect to compensate for said error. All measures taken to rectify conditions caused by over excavation shall have the Architect's approval, and any increase in cost resulting from such measures shall be borne by the Contractor.

G. Excavation shall not be performed when weather conditions or the conditions of the materials are such that, in the opinion of the Architect, work cannot be performed satisfactorily.

H. Appropriate measures shall be provided to retain excavation sidewalls and to ensure that persons working in or near the excavation are protected. Sheeting shoring or bracing may be used to support the walls of excavations. Method, design, construction and adequacy of any required bracing shall meet the OSHA requirements of 29 CFR Part 1926 and are the responsibility of the Contractor.

I. All damage related to or caused by the excavation shall be repaired at the expense of the Contractor.

J. Unclassified Excavation - For the purposes of payment, materials shall be unclassified except for those beyond the greater of the lines and grades shown in the Drawings. Unclassified excavation shall comprise and include the satisfactory excavation, removal, and disposal of all materials encountered within the lines and grades shown in the Drawings or limits specified herein, whichever is deeper, regardless of the nature of the materials, and shall be understood to include, but not be limited to, earth, topsoil, subsoil, hardpan, fill, foundations, pavements, curbs, piping, railroad track and ties, cobblestones, footings, bricks, concrete, abandoned drainage and utility structures, debris, and materials classified as unsuitable materials. All excavation and replacement, if applicable, with suitable material within the lines and grades shown in the Drawings or the limits specified

herein, whichever is deeper, will be considered and bid as unclassified and shall be included in the Contractor's lump sum (i.e., shall not be paid for using Unit Prices)

K. Removal of unsuitable material beyond the grades and lines shown on the Drawings and specified herein and its replacement, if applicable, as directed will be paid on the basis of contract conditions relative to changes in work or as provided for under the unit rates for respective classification in accordance and following the method of measurement and verification of quantities as defined in this specification.

L. Should quantities of certain materials or classes of work be increased or decreased from what is shown in the drawings and specified herein, the Contract Unit Rates listed below (see Section 3.6.M) should be the basis of payment to the Contractor, or credit to the Owner, for such increase or decrease in the work. The Contract Unit Rates shall represent the exact net amount, per unit, to be paid to the Contractor in the case of increases in the quantities, and the exact amount to be refunded to the Owner in the case of decreases in the quantities. No additional adjustment shall be allowed for overhead, profit, insurance, or other direct or indirect expenses by the Contractor. Contract Unit Rates of materials shall include hauling, storing, stockpiling, moving, importing, spreading, and compacting. Increases or decreases in the quantities should be approved by the Owner.

1. The Contractor shall excavate soil and fill to the limits necessary to achieve the required grades determined by the Architect. The limits of excavation may not coincide with those areas indicated on the Drawings. The excavation areas shown on the Drawings are estimated areas only.
2. If unanticipated bearing soils are encountered beyond the limits of excavation as specified on the Drawings and in the Specifications and at the specified subgrade depth, the Contractor shall notify the Owner’s Representative in writing. The Contractor shall carry the excavation deeper and replace the excavated material with appropriate specified material or concrete as directed by the Architect or Engineer.
3. Removal of topsoil, subsoil, rock, boulder, and organic silt, or silty sand as specified herein and in the Geotechnical Report will not be considered as unanticipated, unsuitable soil conditions at an elevation above specified subgrade elevations. Similarly, removal of these materials within paved areas as specified herein will not be considered unanticipated unsuitable soil conditions. Proposed over excavation as shown on the plans will not be considered unanticipated soil conditions.

M. Provide unit process as follows:

1. For each type of material listed in PART 2 - PRODUCTS, separate unit rates shall be provided for imported material and material processed onsite. The unit rates shall include furnishing/processing, stockpiling, placing, and compacting the material)
2. Provide unit rate for rock excavation in trenches and pits, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.
3. Provide unit rate for rock excavation as open excavation, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.

N. Unsuitable Soil Allowance: The Contractor shall carry in the base bid 1,000 cu. yds. for removal of unanticipated, unsuitable soil materials beyond the subgrade limits shown on all contract drawings and defined within the specification and beyond the quantity required for over excavation as shown on the plans and defined within the specifications. Allowance shall cover removal and disposal of unsuitable soil and furnishing imported suitable backfill materials compacted in place as directed herein. The base bid shall cover all costs related to such excavation, removal off site, disposal, and replacement with compacted fill of approved material, overhead, and profit. No amount other than that herein specified will be paid by the Owner for the work defined herein.

1. If the total void volume of unanticipated unsuitable material excavation below specified subgrades, and its replacement with compacted fill exceeds the amount included in the Contract as listed above, the Owner shall pay the excess excavation and replacement at the unit price submitted in the Bid Attachment – Unit Prices Schedule.
2. If the total quantity of unanticipated unsuitable materials below specified subgrades, and its replacement with compacted fill is less than the amount included in the Contract as listed above, the contract sum will be decreased by the difference in excavation and its replacement multiplied by the unit price submitted in the Bid Attachment – Unit Prices Schedule.
3. Final excavated surfaces shall be surveyed by the Contractor and shall be measured from specified subgrade to bottom of excavation. Payment shall be based upon actual volumes with no bulking or swell factors applied. Contractor shall submit all survey data and quantity calculations to Architect for approval.

O. Petroleum Contaminated Soil Allowance: The Contractor shall carry in the base bid 100 cu. yds. for removal of unanticipated, petroleum contaminated soil materials. Allowance shall cover removal and disposal of petroleum contaminated soil and furnishing imported suitable backfill materials compacted in place as directed herein. The base bid shall cover all costs related to such excavation, removal off site, disposal, and replacement with compacted fill of approved material, overhead, and profit. No amount other than that herein specified will be paid by the Owner for the work defined herein.

1. If the total void volume of unanticipated petroleum contaminated material excavation, and its replacement with compacted fill exceeds the amount included in the Contract as listed above, the Owner shall pay the excess excavation and replacement at the unit price submitted in the Bid Attachment – Unit Prices Schedule.
2. If the total quantity of unanticipated petroleum contaminated materials, and its replacement with compacted fill is less than the amount included in the Contract as listed above, the contract sum will be decreased by the difference in excavation and its replacement multiplied by the unit price submitted in the Bid Attachment – Unit Prices Schedule.
3. Final excavated surfaces shall be surveyed by the Contractor and shall be measured from specified subgrade to bottom of excavation. Payment shall be based upon actual volumes with no bulking or swell factors applied. Contractor shall submit all survey data and quantity calculations to Architect for approval.

3.8 ROCK EXCAVATION

A. Definitions and Classifications: The following classifications of excavation will be made only when rock excavation is required.

1. "Earth Excavation" consists of removal and disposal of pavement and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, material of any classification indicated in data on subsurface conditions, and other materials encountered that are not classified as rock excavation.
2. "Rock Excavation" consists of removal and disposal of materials encountered that cannot be excavated without continuous and systematic drilling and blasting or continuous use of a ripper or other special equipment, except such materials that are classed as earth excavation. Typical of materials classified as rock excavation are as follows:
    a. Rock, stone, or weathered bedrock in original ledge.
    b. Sandstone in original ledge.
    c. Boulders on site, outside trench limits, exceeding three cubic yards in volume.
    d. Boulders within trench limits, exceeding one cubic yard in volume.

B. Should highly fractured or weathered bedrock be encountered during excavation, the following shall apply:

1. When the material is encountered in trenching operations or under footings, it shall be excavated or ripped with a hydraulic backhoe equal to or larger than Caterpillar ~~225 backhoe and will be classified as Earth Excavation~~**345 excavator**. When it is demonstrated to the satisfaction of the Architect and the Soils Representative that this material can no longer be removed with a hydraulic backhoe and requires drilling and blasting, this material shall be classified as Rock Excavation. For excavation procedures when this material is encountered under footings, refer to paragraph below. **[ADD #6]**
2. When this material is encountered in open excavation, it shall be classified as earth excavation until drilling and blasting or continuous ripping is necessary as defined hereinabove.

C. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

D. Allowance for Rock Excavation: The Contractor shall carry in the Base Bid an allowance for 20 cubic yards or rock encountered in trench excavation removed from the site. The Contractor shall also carry in the Base Bid an allowance of 20 cubic yards of open rock excavation removed from the site. The Base Bid shall cover all costs relating to such rock excavation, including blasting, removal and placement of the excavated material, overhead and profit. No amount other than that herein specified will be paid by the Owner for excavation herein defined.

1. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed unit price shall be applicable to variations in excess of the allowance quantity up to 100% of the allowance quantity.
2. If the total quantity of Rock Excavation, open and/or trench, is less than the amount of Rock Excavation included in the Contract as listed above, the

Contract sum will be decreased by the difference in Rock Excavation multiplied at the fixed unit price. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed unit price shall be applicable to variations of the allowance quantity by decreases of 100% of the allowance quantity.

E. Measurements:

1. When, during the process of excavation, rock is encountered, such material shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Architect shall be notified by the Contractor, before proceeding further. The areas in question shall then be cross-sectioned as hereinafter specified.
2. Failure on the part of the Contractor to uncover such material and to notify the Architect and proceeding by the Contractor with the rock excavation before cross-sections are taken, will forfeit the Contractor's right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.
3. The Contractor shall employ and pay for a Professional Civil Engineer or Land Surveyor registered in the State of Rhode Island to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Soils Representative and the computations approved by the Architect. The Owner has the option to perform independent cross-sections and computation of rock quantities.
4. Where removal of boulder or ledge is required outside the established payment lines, the extent of this removal and basis of payment shall be determined by the Architect.

F. If ledge is encountered within the limits of the Proposed Building Area, the Contractor shall excavate this material 12 inches below subgrade of footings and 18 inches below subgrade of slabs and pavement unless otherwise directed by the Architect or Soils Representative. All loose or shaken rock shall be removed and replaced with compacted gravel fill, crushed stone or lean concrete as directed by the Soils Representative.

G. Rock excavation for foundations outside of the Building Area: Remove rock to foundation or footing subgrade. All rock bottoms for foundations shall be carefully examined. Loose or shaken rock shall be removed to solid bearing, and the rock surface leveled, or shelved to a slope not exceeding one inch per two feet, or as directed.

H. Prepared rock subgrades shall be compacted with at least four passes of a self-propelled vibratory roller such as Dyna Pac CA-30D (44,000 lbs. Centrifugal force) or equivalent. Rock subgrades in utility trenches shall be recompacted with at least four passes a walk-behind vibratory drum roller or other equivalent equipment having at least 10,000 pounds centrifugal force and sufficient to provide a firm, stable subgrade.

I. If any part of the rock excavation at footings to be carried beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor shall, at his own expense, furnish and install concrete of same strength as footings to the required subgrade level of the footings as shown on the Drawings. Dowelling or other corrective structural measures as directed by the

Architect may also be required to properly anchor or reinforce the concrete. If rock excavation is carried beyond the depth and dimensions to subgrade in other areas, the Contractor shall, at his own expense, furnish and install compacted gravel fill to subgrade as directed by the Architect.

J. Basis of Payment: The total amount of rock excavation will be based upon the in-situ volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment, and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

K. Payment Lines for Rock Excavation:

1. Payment lines for columns and footings shall be a vertical line one-foot off the edge of the footings; the depth shall be measured at 12 inches below the bottom elevations shown on the Drawings. Payment lines for walls to be damp-proofed shall be a vertical line three feet outside the walls. Vertical payment lines shall be as specified hereinafter.
2. Payment lines for manholes and catch basins shall be one-foot outside of the outer wall and 12 inches below subgrade beneath the structure.
3. Payment lines for rock excavation under slabs on grade shall be 18 inches below the bottom of the slab. Payment lines for rock excavation at plant beds shall be 12" at edge and full depth of required elevation for loam.
4. Payment lines for rock excavation at paved areas and lawns shall be 18 inches below bottom of asphalts.
5. Payment lines for rock excavation under pipes within the building and for utility trenches outside the building lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus two feet for pipes up to 18 inches. For pipes 18 inches and larger payment lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus three feet. Payment lines at bottom of all pipe and utility trenches shall be 12 inches below the bottom of the pipe.

3.9 STORAGE OF SOIL MATERIALS – STOCKPILING

A. The Contractor shall be responsible for managing and tracking any and all materials excavated and placed in stockpiles for testing.

B. B. Materials shall be stockpiled on site at locations proposed by the Contractor and approved by the Architect. Stockpiled materials shall be of sufficient quantities to meet project schedule and requirements

C. Tracking of the stockpiles shall be performed in accordance with the approved Work Plan submitted by the Contract in accordance with Section 01 33 00.

D. The temporary stockpiled fill must be removed from the Site in accordance with applicable regulatory deadlines however no later than the completion date of this contract or 90 days from the date the stockpile was created, whichever is encountered first.

E. Stockpiles shall be securely barricaded and clearly labeled. Differing materials shall be separated with dividers or stockpiled apart to prevent mixing.

F. The Contractor shall direct surface water away from stockpile site to prevent erosion or deterioration of materials. Soils shall be suitably dewatered prior to their relocation on Site or disposal off site.

G. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.11 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Trenches shall be excavated to the necessary width and depth for proper laying of pipe or other utility and excavation side slopes shall conform to OSHA requirements. Minimum width of trenches shall provide clearance between the sides of the trench and the outside face of the utility. Maximum trench sizes are as shown on the Drawings or as specified herein. The depth of the trench shall be twelve inches below the bottom of the pipe barrel or respective utility. If the existing soil at the final subgrade excavation is found not suitable, the Architect or Soils Representative may approve removal and replacement of material.

1. 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 (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
2. Clearance: As indicated on plans.
3. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

C. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for accommodation and safety of the traveling public and as necessary to satisfy the required permits and codes.

3.12 SUBGRADE INSPECTION, COMPACTION AND PROOF ROLLING

A. Notify Architect when excavations have reached required subgrade.

B. Proof compact all subgrades in accordance with Subsection 1.2 of this Specification Section and the Geotechnical Report to identify soft pockets and areas of excess yielding. Do not proof compact wet or saturated subgrades.

1. Completely proof compact subgrade in one direction repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).

C. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect and/or Soil Representative, and replace with compacted fill as directed.

D. Proof compacting shall be completed utilizing a 20-Ton vibratory drum roller for granular soils. Should clay or other cohesive soils be encountered, sheep's foot roller shall be utilized. A total of 6 passes shall be considered complete.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect and/or soil representative, without additional compensation.

3.13 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage,
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

B. If, through failure or neglect of the Contractor to conduct the excavation work in a proper manner, the surface of the subgrade is in an unsuitable condition for proceeding with construction, the Contractor shall, at his own expense, remove the unsuitable material and replace it. Failure of the Contractor to control surface or ground water adequately, premature excavation at the work site, or other manifestations of the Contractor's neglect or improper conduct of the work, as determined by the Architect, shall be grounds for requiring removal and replacement of unsuitable subgrade without additional compensation.

C. Grading in the vicinity of backfilling shall be properly pitched to prevent water from running into the backfilled area. Work areas shall be kept free from water during performance of the work under this Contract at no expense to the Architect. The Contractor shall build diversion berms and other devices necessary for this purpose.

D. The Contractor shall not commence backfilling operations until the Architect gives approval.

E. After the subgrade has been prepared, fill material shall be placed and built-up in successive layers until the required elevations are reached. No fill shall be placed on a frozen surface, nor shall snow, ice, or other frozen material be included in fill. Wet materials containing moisture in excess of the amount necessary for satisfactory placement or compaction shall not be used.

F. All fill shall be brought up in essentially level lifts and shall be placed in levels by standard methods. The method of placement shall not disturb or damage other work. Layers of fill shall not exceed twelve inches of uncompacted thickness before compaction, unless otherwise specified or as necessary for proper subgrade stabilization.

G. Place backfill on subgrades free of mud, frost, snow, or ice.

H. Filling operations shall continue until the fill has been brought up to the finished slopes, lines, and grades making proper allowances for thickness of surface treatment.

I. The entire surface of the work shall be maintained free from ruts and in a condition that will permit construction equipment to travel readily over any Section. The top surface of each layer shall be made level or slightly sloped away from the center of the filled area. Fills shall be graded to drain and compacted/sealed whenever precipitation is expected.

J. Backfilling shall not be performed when weather conditions or the conditions of the material are such that, in the opinion of the Architect, work cannot be performed satisfactorily.

3.14 ACCEPTABLE BACKFILL

A. Backfill materials shall be placed in the areas as indicated in the table below:

Fill below footings and slabs within the Building Area	Sand and Gravel Fill (Geotech Report)
Fill around footings for building and structures within the Influence zone	Sand and Gravel Fill (Geotech Report)
Fill below pavement subbase	Ordinary Fill (Geotech Report)
Fill below sidewalk subbase	Ordinary Fill (Geotech Report)
Fill placed in top 1 foot below sidewalks	Select Fill
Fill within utility trenches below pavement and sidewalk subbase	Granular Fill (Geotech Report)
Fill below utility bedding	Ordinary Fill
Fill placed in landscaped areas outside of the Influence Area of footings, retaining walls, and slopes	Common Borrow
Fill placed around banks of pipes	Granular Fill (Geotech Report)
Fill around footings for building and structures within the Influence zone	Structural Fill
Fill below pavement subbase	Ordinary Fill

3.15 UTILITY TRENCH BACKFILL

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

B. Place and compact bedding on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Place and compact initial backfill material, free of particles larger than 1 inch in any dimension, 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. Coordinate backfilling with utilities testing.

D. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

E. Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Backfill voids with approved backfill material while installing and removing shoring and bracing. Where voids cannot be backfilled with compacted backfill, the voids shall be filled with flowable fill.

G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.16 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.

1. Sequentially place and compact fill material in layers to required elevations.

B. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.17 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 to -3 percent and is too wet to compact to specified dry unit weight.
3. If in the opinion of the Architect or Geotechnical Engineer, additional moisture is required, water shall be applied by sprinkler tanks or other uniform distribution devises. If excessive amounts of water or if rain should cause excessive wetness, the area shall be allowed to dry as provided above.

3.18 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. Grading shall be done by standard methods.

Areas adjacent to structures and other areas inaccessible to heavy grading equipment shall be graded by manual methods. Embankments shall be graded at all times to ensure runoff of water.

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.
3. Provide proper drainage from the site, no grading shall be done to direct water to damage or potentially damage adjacent property or work executed under this contract.

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 [1 inch]
2. Walks: Plus or minus [1 inch]
3. Pavements: Plus or minus [1/2 inch]

3.19 FIELD QUALITY CONRTOL

A. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

B. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed in accordance with Subsection 1.7 of this Specification Section and:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 500 sq. ft. or less of paved area, but in no case fewer than 3 tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.

C. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.20 COMPACTION REQUIREMENTS

A. The following table lists minimum compactive efforts, which are required for all, fill materials. Compaction of each lift shall be completed before placement and compaction of the next lift is started. The compaction equipment shall make an equal numbers of transverse and longitudinal coverages of each lift. The degree of compaction for fill placed in various areas shall be as follows:

1. Under concrete slabs and footings 95%
2. In paved areas

Within aggregate base course	95%
Within aggregate subbase course	95%

Below subbase course 9**5%**
~~2%~~ **[ADD #6]**

3. In landscaped areas (To be checked/approved by RLA) 90%
4. Around and Above Utilities below
   Below Pavement subbase in paved areas 95%

*Percentage of maximum dry density of the materials at optimum moisture content as determined by methods or tests for ASTM designation D1551 Method D.

B. Compaction shall be accomplished by vibratory rollers, multiple wheel pneumatic tired rollers or other types of approved compacting equipment. Loaded trucks, low beds, water wagons and the like shall not be considered as acceptable compaction equipment unless specifically approved by the Architect for a particular location. Equipment shall be of any such design that it will be able to compact the fill to the specified density in a reasonable length of time. All compaction equipment shall be subject to the approval of the Architect.

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. Backfill shall not be placed against walls until they are braced or have cured sufficiently to develop strength necessary to withstand, without damage, pressure from backfilling and compacting operations.

E. Before backfilling against walls, the permanent structures must be completed and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect. Correct any damage to the structure caused by backfilling operations at no cost to the Owner.

F. During backfilling, the difference in elevation of backfill on opposite sides of the structure shall not exceed 24 inches, except as noted. Where backfill of buried wall is only on one side, only hand-operated roller or plate compactors shall be used within a lateral distance of 5 feet of back of wall for walls less than 15 feet high and within 10 feet of back of wall for walls more than 15 feet high. The backfill material shall be compacted with a dynamic vibratory compactor weighing no more than 1000 pounds and imparting a minimum of no more than 8 kips of force to the subgrade.

G. The Contractor shall compact all fills made during the day of work prior to leaving the project for the evening. The upper layer shall be pitched as necessary to provide positive drainage towards swales or interceptor ditches to minimize ponding and erosion should it rain.

3.21 COMPACTION TESTING

A. The Contractor shall make all necessary excavations and preparations for testing. Excavations for density tests shall be backfilled with material similar to that excavated, and compacted to the specified density by the Contractor. Failure of the backfill material to achieve the specified density will be just cause for rejection of any or all portions of the excavation Section tested. The Contractor will not be granted an extension of time or additional compensation for testing or repair of backfill ordered by the Architect.

B. Field density tests will be made by the Owner's Inspection Agency in accordance with the Method of Test for ASTM Designation D1556 or D6938, to determine adequacy of compaction; the location and frequency of such field tests shall be at the Architect's Inspection Agency's discretion.

C. All field density tests results shall be reviewed by the Architect prior to the placement of concrete.

D. The Contractor shall notify the Inspection Agency when an area is ready for compaction testing. This notification shall be 48 hours in advance of placing or final compaction so that the Architect Inspection Agency has adequate time to take compaction tests.

E. Cooperate with the Architect in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests. The Contractor will be informed by the Architect of areas of unsatisfactory density which may require improvements by removal and replacement, or by scarifying, aerating, sprinkling (as needed), and recompaction prior to the placement of the new lift. No additional compensation shall be paid for work required to achieve proper compaction.

F. The Owner or Architect's Inspection Agency's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Inspection Agency nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.

3.22 PROTECTION

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

1. 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.

B. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

1. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
2. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.23 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Project property.

3.24 VIBRATION MONITORING [ADD #6]

The Owner's Site Contractor shall perform vibration monitoring during construction. For bidding purposes, the site contractor shall assume three (3)

seismographs throughout the duration of construction. The peak particle velocity should be less than two (2) inches per second (ips) for concrete foundations, 1 ips for masonry foundations, and 0.5 for rubble foundations.

3.25 REMOVAL OF EROSION CONTROL MEASURES3ITORING

B. Remove temporary drainage swales, check dams, siltation sumps, hay bales, siltation fencing and other temporary drainage, erosion and siltation control measures when permanent drainage control measures have been installed and grass is established in drainage areas leading to siltation sumps. Contractor shall excavate and remove all sediments from siltation sumps prior to backfilling the sumps. Remove erosion control measures when approved by the Architect.

End of Section

SECTION 31 60 00
GROUND IMPROVEMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. The work consists of improving the existing ground by means of aggregate pier soil reinforcement or by means of rigid inclusions as specified herein. Aggregate piers and/or rigid inclusions shall be installed below building foundations and slabs, stairs, access ramps, retaining walls, sidewalk attached/connected to the proposed building, utility structures, and twin 48-inch combined sewer pipes.

B. Work shall consist of designing, furnishing, and installing aggregate pier and/or rigid inclusion ground improvements to the lines and grades designated on the project foundation plan and civil drawings as specified herein.

C. The installation of the ground improvement shall also include the removal and disposal of excavation spoils as a result of the installation process. The excavated material is all assumed to be unsuitable and shall either be wasted or used in accordance with the Earth Moving Specifications. The cost of installation of the ground improvement shall include the cost of hauling, stockpiling, and disposal of the excavated material.

D. The aggregate piers and/or rigid inclusions shall be in a columnar-type configuration and shall be used for support of building foundations, floor slabs, stairs, access ramps, retaining walls, sidewalk attached/connected to the proposed building, utility structures, and twin 48-inch combined sewer pipes.

E. Based on the borings and probes, the ground improvements are anticipated to extend to depths of about 40 feet over an area of about one half (1/2) to two thirds (2/3) of the proposed building footprint. Over the remainder of the proposed building footprint, the ground improvements are anticipated to extend to depths of up to 60 feet. For retaining walls and utilities, the ground improvements are anticipated to extend between 40 and 60 feet beneath the ground surface.

1.03 WORK INCLUDED

A. Provision of all equipment, material, labor, and supervision to design, furnish, and install aggregate piers and/or rigid inclusions for support of building foundations, floor slabs, stairs, access ramps, retaining walls, sidewalk attached/connected to the proposed building, utility structures, and twin 48-inch combined sewer pipes.

B. The aggregate pier and/or rigid inclusion design and installation shall adhere to all methods and standards described in this Specification.

C. These ground improvements are installed by driving a mandrel and hammer to the design depth, feeding the backfill material through the hollow mandrel, and compacting the backfill in one-foot lifts using the hammer; thus, generating no spoils. If the aggregate piers are installed in

augured holes, the testing, if needed, and disposal of the spoils should be included in the contractor's bid price.

D. The design of the ground improvement shall be verified with a modulus load test.

E. The subsurface conditions at the site included asphalt, topsoil, and existing fill, overlying organic soil, peat, and natural sand and silt. Based on the SPT data, the fill and some of the natural sand and silt were very loose to medium dense.

F. The existing fill contained organic soil, asphalt, brick, roots, glass, trash, wood, and metal, and may contain construction debris and other obstructions that need to be pre-trenched. The pre-trenching, if required, will be performed by the Contractor.

G. The ground improvement contractor shall monitor vibration through installation of seismographs at the nearby building during installation of aggregate piers and/or rigid inclusions.

1.04 RELATED SECTIONS

A. Related Sections include the following:
1. Division 00 Document "Unit Prices Form" for schedule of unit prices.
2. Division 01 Section "Unit Prices" for unit prices.
3. Division 01 Section "Construction Progress Documentation" for recording pre-excavation and earthwork progress.
4. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
5. Division 01 Section "Temporary Erosion and Sediment Control" for temporary erosion and sediment controls.
6. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above and below-grade improvements and utilities.
7. Division 31 "Earth Moving."
8. Appendix E Geotechnical Report.

1.05 APPROVED INSTALLERS

A. The Aggregate Pier and/or rigid inclusion installer (the Installer) shall be approved by the Engineer. Prior to approval, Installers and their Designers are required to submit to the Owner a qualification statement to demonstrate 5 years experience on at least 10 projects of a similar scope and nature. Additionally, prior to approval, Installers and their Designers are required to submit to the Owner a preliminary design document. Without exception, no alternate installer will be accepted unless approved by the Owner.

B. Installers of aggregate pier and/or rigid inclusion foundation systems shall have a minimum of 5 years of experience with the installation of aggregate pier systems and shall have completed at least 10 projects in New England.

C. Local installer of aggregate piers include:
1. Vibro Stone Columns (VSC) (aggregate piers) or Controlled Modulus Column (CMC) (rigid inclusions) by Menard (Phone: (781) 281-0371 or (908) 603-8224).
2. Vibro Piers (VP) (aggregate piers) or Vibro Concrete Columns (VCC) (rigid inclusions) by Hayward Baker/Keller (Phone: (401) 334-2565).
3. Aggregate Piers (AP) (aggregate piers) or GeoConcrete Columns (GCC) (rigid inclusion)by Geopier (Phone: (860) 531-9137). The Local installer for Geopier Is HDI – (781) 848-2110.

4. Vibro Stone Columns (VSC) (aggregate Piers) Subsurface Constructors (Phone: (866) 421-2460).
5. Aggregate Piers by H. B. Fleming (Phone: (207) 799-8514).

1.06 REFERENCE STANDARDS

A. Design:
1. "Ground Modification Methods Reference Manual – Volume I, "U.S. Department of Transportation, Federal Highway Administration, FHWA-NHI-16-027, FHWA GEC 013, April 2017.
2. “Control of Settlement and Uplift of Structures Using Short Aggregate Piers,” by Evert C. Lawton (Assoc. Prof., Dept. of Civil Eng., Univ. of Utah), Nathaniel S. Fox (President, Geopier Foundation Co., Inc.), and Richard L. Handy (Distinguished Prof. Emeritus, Iowa State Univ., Dept. of Civil Eng.), reprinted from *IN-SITU DEEP SOIL IMPROVEMENT, Proceedings of sessions sponsored by the Geotechnical Engineering Division/ASCE in conjunction with the ASCE National Convention held October 9-13, 1994, Atlanta, Georgia.*
3. “Settlement of Structures Supported on Marginal or Inadequate Soils Stiffened with Short Aggregate Piers,” by Evert C. Lawton and Nathaniel S. Fox. *Geotechnical Special Publication No. 40: Vertical and Horizontal Deformations of Foundations and Embankments,* ASCE, 2, 962-974.
4. “Behavior of Geopier®-Supported Foundation Systems during Seismic Events,” by Kord Wissmann, Evert C. Lawton, and Tom Farrell. Geopier Foundation Company, Inc. Blacksburg, VA ©1999.
5. “The design of vibro replacement.” H.J. Priebe. *Ground Engineering*, London. Dec 1995.

B. Modulus Testing:
1. ASTM D 1143 – Pile Load Test Procedures
2. ASTM D 1194 – Spread Footing Load Test

C. Materials and Inspection:
1. ASTM D 1241 – Aggregate Quality
2. ASTM D 422 – Gradation of Soils
3. ASTM C39/C39M-12a – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C-150-05 – Standard Specification for Portland Cement
5. ASTM D1557 – Moisture Density Relationship for Soils

D. Where specifications and reference documents conflict, the Owner shall make the final determination of the applicable document.

1.07 DEFINITIONS

A. Aggregate Piers: VSC, VP, or AP. Rigid Inclusions: CMC, VCC, or GCC.

B. Test Element: Aggregate pier and/or rigid inclusion element installed as a non-production element for the purpose of performing a modulus test. Test elements shall be installed prior to the start of production elements at a location representative of the subsurface conditions and loading. Where different subsurface conditions are encountered that warrant different types of improvements, a modulus test shall be performed for each type of improvement.

1.08 SUBSURFACE INFORMATION

A. Subsurface explorations have been performed at the site by the Geotechnical Engineer. The results of the explorations are included in the geotechnical report prepared by Lahlaf Geotechnical Consulting, Inc. (LGCI) 100 Chelmsford Road, Suite 2, Billerica, MA 01862 dated August 4, 2023.

B. The subsurface explorations and geotechnical report were performed primarily for use in preparing the foundation design and are included for the convenience of the contractor. Use and interpretation of these data for purposes of the work shall be the responsibility of the Installer. Subsurface conditions and groundwater levels are not considered as accurate for any times or locations other than the specific time and location of each of the explorations.

C. The Owner assumes no responsibility for the Installer's failure to make his own site investigation and makes no representation other than the soils reports regarding the character of the soil or subsurface conditions which may be encountered during the performance of the work. The Installer shall refer to the Geotechnical Report. Failure by the Installer to be aware of existing site conditions shall not be cause for additional cost to the Owner.

D. Use and interpretation of these data for purposes of the work shall be the responsibility of the Installer. Subsurface conditions and groundwater levels are not considered as accurate for any times or locations other than the specific time and location of each of the explorations.

E. The installer may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

F. No claim for extra cost or extension of time resulting from reliance by the Installer on information presented herein shall be allowed, except as provided in the Contract.

1.09 CERTIFICATIONS AND SUBMITTALS

A. Shop drawings that include spacing, diameter, length, installation procedure and sequence of construction with sufficient details, planned cut off and tip elevations, material, proposed equipment, aggregate gradation, and mix design. The submittal shall also include a plan showing numbered locations of aggregate piers. The design shall conform to the criteria in Part 3.01 of this specification.

B. LEED Submittals:
1. Complete “Sustainable Materials Attributes Submittal Form” attached to Section 01 81 13 “Sustainable Design Requirements”.
2. Provide supporting documentation, as required in Section 01 81 13, from manufacturer for materials attributes data submitted.

C. Design Submittal: Design Calculations and Shop Drawings - The Installer shall submit detailed design calculations and construction drawings prepared by the ground improvement designer (the Designer) for review and approval by the Owner in accordance with Section 3.2 of these specifications. All plans shall be sealed by a Professional Engineer in the State of Rhode Island.
1. The Installer shall submit detailed design calculations, construction drawings, and shop drawings (the Design Submittal), for approval at least two week(s) prior to the beginning of construction. A detailed explanation of the design parameters for settlement calculations shall be included in the Design Submittal. Additionally, the quality control test program for the aggregate piers, meeting these design requirements, shall be submitted. All computer-generated calculations and drawings shall be prepared and sealed by a Professional Engineer, licensed in the State of Rhode Island.

2. The following shall be included in the design calculation submittal:
   a. A written summary report that describes the overall ground improvement design
   b. Applicable code requirements and design references. Design criteria including, soil shear strengths including friction angle and cohesion, unit weights, aggregate pier and/or rigid inclusion hole diameter, aggregate pier and/or rigid inclusion spacing, aggregate pier and/or rigid inclusion unit weight and friction angle/concrete compressive strength, composite shear strength parameters, and any other design assumptions.
   c. Design calculation sheets with project number, foundation location, designation, date of preparation, initials of designer and checker, and page number at the top of each page. An index page with the design calculations shall be provided.
   d. Design notes including an explanation of any symbols and computer programs used in the design.
   e. Detailed subgrade preparation notes and requirements.
   f. A complete list of the equipment proposed for use, including a description of the characteristics of each piece of equipment.
   g. Detailed description of the methods and equipment proposed for loading of the test element during the modulus test and load test. Any deviation from Section 3.7 of this specification shall be specifically noted with explanation for the requested deviation. Without exception, no deviations will be accepted unless approved by the Owner.
3. Working Drawings: Utility locations, right of way, and other applicable information are available on the plans. Working drawings shall include, but not be limited to the following items:
   a. A plan view of the aggregate pier ground improvement for identifying:
      1) Right of way, permanent or temporary construction easement limits, location of all known active or abandoned existing utilities, adjacent structures, or other potential interferences. Any drainage structure or drainage pipe centerline behind, passing through, or passing under the structure.
      2) Limits of the aggregate pier and/or rigid inclusion ground improvement and layout of the numbered individual aggregate piers and/or rigid inclusions.
   b. Subsurface exploration locations shown on a plan view of the proposed structure alignment with appropriate reference base lines to fix the locations of the explorations relative to the structure.
   c. Elevation view showing aggregate pier and/or rigid inclusion locations, elevations, and depth of improvement; location of drainage elements and expansion/contraction joints when applicable.
4. The submittal shall include a plan showing aggregate piers and/or rigid inclusions with aggregate pier and/or rigid inclusion numbers, and a schedule showing aggregate pier and/or rigid inclusion number, aggregate pier and/or rigid inclusion length, aggregate pier and/or rigid inclusion diameter, top and bottom design elevations, and top and bottom as-installed elevations.

D. Qualification Data:
   1. For qualified professional engineer licensed in the State of Rhode Island.
   2. For qualified Quality Control Representative.

E. Professional Liability Insurance Submittal: - The Designer and Installer shall have Errors and Omissions design insurance for the work. The insurance policy should provide a minimum coverage of $3 million per occurrence.

F. Modulus/Load Test Reports – A modulus test(s) is performed on a non-production aggregate pier and/or rigid inclusion element as required to verify the design assumptions. The Installer shall furnish the Owner a description of the installation equipment, installation records, complete

test data, analysis of the test data, and verification of the design parameter values based on the modulus test results. Test elements shall be installed prior to the start of production elements at a location representative of the subsurface conditions and loading. The report shall be prepared under direction of a Registered Professional Engineer in the State of Rhode Island.

G. Daily Aggregate Pier and/or Rigid Inclusion Progress Reports – The Installer shall furnish a complete and accurate record of aggregate pier and/or rigid inclusion installation to the Owner. The record shall indicate the aggregate pier and/or rigid inclusion location, length, volume of aggregate/concrete used or number of lifts, densification forces during installation of the aggregate, and final elevations or depths of the base and top of aggregate piers and/or rigid inclusions. The record shall also indicate the type and size of the installation equipment used, and the type of aggregate used. The Installer shall immediately report any unusual conditions encountered during installation to the Designer and to the Owner.

H. Submit calibration records for the load cells, the hydraulic jacks, the pumps, and the pressure gauges At least two weeks before performing the modulus and load tests.

I. The Ground Improvement is a subcontractor design. The subcontractor is fully responsible for the adequacy of the design and the performance of the system.

J. If required, the Installer/Designer shall include in its submittal an instrumentation plan as they own the design of the ground improvement and the performance of the proposed footings and slabs.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS, AGGREGATE PIER AND/OR RIGID INCLUSION DESIGN

A. The design of the aggregate piers and/or rigid inclusions under the proposed building shall be based on a maximum allowable bearing pressure of 3,000 psf and the allowable total settlement of 1 inch or less and an allowable differential settlement of 3/4 inch or less over a distance of 25 feet under static loads for footings, and a maximum of 0.5-inch settlement under slabs. The aggregate pier and/or rigid inclusion design shall be based limiting the total earthquake-induced settlement to less than 3 inches and earthquake-induced differential settlement of less than ¾ inch over a distance of 25 feet. The design The aggregate piers and/or rigid inclusions for utilities should be designed to reduce the potential for settlement between utilities and utility structures.

B. The contractor is allowed to install a combination of rigid inclusions for foundation support and aggregate piers to reduce the earthquake induced settlement.

C. A load transfer platform (LTP) should be installed on top of the aggregate piers and/or rigid inclusions, under the footings and slabs, stairs, access ramps, retaining walls, utility structures, and sidewalk attached/connected to the proposed building, in accordance with the requirements of the specialty subcontractor’s designing the aggregate piers and/or rigid inclusions.

D. The aggregate piers and/or rigid inclusions shall be designed in accordance with generally accepted engineering practice. The design life of the structure shall be 50 years.

E. The aggregate pier and/or rigid inclusion elements shall be designed using an aggregate pier and/or rigid inclusion stiffness modulus to be verified by the results of the modulus test and/or rigid inclusion load test described in Section 3.7 of these specifications.

2.02 AGGREGATE

A. Aggregate used by the Installer for aggregate pier construction shall be pre-approved by the Designer and Owner and shall demonstrate suitable performance during modulus testing. Typical aggregate consists of Type 1 Grade B in accordance with ASTM D-1241-68, No. 57 stone, or other graded aggregate approved by the Designer.

B. Potable water or other suitable source shall be used to increase aggregate moisture content where required. The Owner shall provide such water to the Installer.

2.03 PORTLAND CEMENT

A. Type I or Type II.

2.04 GROUT MIX

A. Minimum Compressive Strength:
   1. 4,000 psi at 28 days.
   2. 2,000 psi at 7 days.

PART 3 - EXECUTION

3.01 APPROVED INSTALLATION PROCEDURES

A. The following sections provide general criteria for the construction of the aggregate piers. Unless otherwise approved by the Designer, the installation method used for aggregate pier construction shall be that as used in the construction of the successful modulus test.

B. Aggregate Piers installed using Rammed Aggregate Pier Systems:
   1. Aggregate Pier (AP) systems shall be constructed by advancing a specially designed mandrel with a minimum 15-ton static force augmented by dynamic vertical ramming energy to the full design depth. The hollow-shaft mandrel, filled with aggregate, is incrementally raised, permitting the aggregate to be released into the shaft, and then lowered by vertically advancing and/or ramming to densify the aggregate and force it laterally into the adjacent soil. The cycle of raising and lowering the mandrel is repeated to the top of pier elevation. The cycle distance shall be determined by the Designer. The mandrel shall be raised at a rate determined from the demonstration pier testing or no faster than 1 foot in 5 seconds. The crowd pressure shall be recorded to provide a measure of the vertical densification force as the mandrel is driven on its compaction stroke.
   2. At AP element locations, water or compressed air shall be used, if necessary, as determined from the flow test, to enhance free flow of aggregate through the mandrel as determined during the performance of a flow test. Water or air flow shall be discontinued when the mandrel reaches the 3-foot raise height.
   3. At the completion of the pier installation, the hammer shall be turned off and the mandrel pushed downward applying full crowd pressure on the top of the pier to provide preloading.
   4. At completion of the pier installation, the remaining stone in the mandrel may be emptied outside the pier location to allow for a measure of the remaining volume of aggregate.
   5. Special high-energy impact densification apparatus shall be employed to densify the AP elements during installation. The apparatus shall apply direct vertical impact energy to each constructed lift of aggregate.
   6. Densification shall be performed using a chained mandrel.

7. Downward crowd pressure shall be constantly applied to the mandrel shaft.
8. The Installer shall provide a full-time Quality Control Representative on-site during the installation process.

C. Aggregate Piers Installed Using Vibrator:
1. If a vibrator is used to construct the aggregate piers, the Installer shall use an electric down-hole vibrator capable of providing at least 80 HP of rated energy and a centrifugal force of 15 tons. The vibrator diameter must be at least 60% of the aggregate pier design diameter. An appropriate metering device should be provided at such a location that inspection of amperage increase may be verified during the operation of the equipment. The metering device may be an ammeter directly indicating the performance of the vibrator. The vibrator shall be a minimum of 16 inches in diameter. Complete equipment specifications should be submitted to the Engineer prior to commencement of the fieldwork.
2. The probe and follower tubes shall be of sufficient length to reach the elevations shown on the Installer's approved construction drawings. The probe, used in combination with the available pressure to the tip jet, shall be capable of penetration to the required tip elevation.
3. The probe shall penetrate into the foundation soil layer to the minimum depths required in the Installer's construction plans. After penetration to the required depth, the probe shall not be withdrawn more than 2 feet at any time unless the stone stops flowing to the bottom of the probe.
4. Redriving the probe into the treated depth shall be attempted at approximately 12 to 18-inch intervals to observe resistance to penetration and amperage build-up. During redriving, the probe tip shall penetrate to within 1 foot of the previous redriving depth.
5. Amperage build-up and backfill quantities will be contingent upon the type of probe used and procedures. Prior to commencement of work, the subcontractor shall discuss the equipment capabilities with the to determine if trial probes will be necessary.
6. The Installer shall provide a full-time Quality Control Representative on-site during the installation process.

D. The as-built center of each aggregate pier and/or rigid inclusion shall be within 6 inches of the locations indicated on the plans. Aggregate piers and/or rigid inclusions installed outside of the above tolerances and deemed not acceptable shall be rebuilt at no additional expense to the Owner.

E. Rigid Inclusions

1. Install the rigid inclusions in accordance with the sequence detailed in the approved work plan. If adjacent rigid inclusions are observed to be influenced by the installation of a neighboring rigid inclusion, the installation sequence shall be modified to prevent disturbance of rigid inclusions. Modifications to the sequence, or replacement of rigid inclusions deemed unusable due to disturbance, shall be completed by the Contractor at no additional cost to the Owner.

2. Cutoff the rigid inclusions to the top elevation of the first layer of the load transfer pad, or slightly higher to allow any required trimming or removal of low strength material at the butt of the rigid inclusion. The cut-off elevation of each rigid inclusion shall be within +/- 0.1 feet. The cut-off shall be made before the concrete sets.

3. Protect the concrete at the top of rigid inclusions from mixing with surrounding soil.

3.02 REJECTED AGGREGATE PIERS

A. Aggregate Pier and/or rigid inclusion elements installed beyond the maximum allowable tolerances shall be abandoned and replaced with new aggregate piers and/or rigid inclusions unless the Designer approves the condition or provides other remedial measures. All material and labor required to replace rejected piers shall be provided at no additional cost to the Owner unless the cause of rejection is due to an obstruction or a mislocation.

3.03 QUALITY CONTROL REPRESENTATIVE

A. The Installer shall have a full-time, on-site Quality Control Representative to verify and report all installation procedures. The Installer shall immediately report any unusual conditions encountered during installation to the Designer and to the Owner. The quality control procedures shall include the preparation of Aggregate Pier and/or rigid inclusion Progress Reports completed during each day of installation containing the following information.
   1. Footing and aggregate pier and/or rigid inclusion location.
   2. Pre-auger diameter and soil conditions encountered during drilling (if required).
   3. Aggregate pier and/or rigid inclusion length.
   4. Planned and actual aggregate pier and/or rigid inclusion elevations at the top and bottom of the aggregate pier and/or rigid inclusion.
   5. Average lift thickness of each aggregate pier and/or rigid inclusion.
   6. Volume of aggregate used in each aggregate pier.
   7. Volume of concrete in each rigid inclusion.
   8. Documentation of any unusual conditions encountered.
   9. Type and size of densification equipment used.

3.04 AGGREGATE PIER MODULES TEST AND/OR RIGID INCLUSION LOAD TEST

A. A minimum of one (1) Modulus Test is required for this project. When authorized, an Aggregate Pier or Rigid Inclusion Modulus Test(s) shall be performed at locations agreed upon by the Designer and the to verify or modify Aggregate Pier designs. Modulus Test Procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194, as outlined in the aggregate pier and/or rigid inclusion design submittal. Aggregate piers shall be tested to 150 percent of the maximum design stress as shown in the aggregate pier design submittal. The modulus tests shall be of the type and installed in a manner specified herein.

B. A telltale shall be installed at the bottom of the test pier so that bottom-of-pier deflections may be determined. Acceptable performance is indicated when the bottom of the pier deflection is no more than 30% of the top of pier deflection at the design stress level, the total settlement is less than the design settlement, and the residual movement, i.e., movement after the unloading, is less than 0.5 inch.

C. ASTM D-1143 general test procedures shall be used as a guide to establishing load increments, load increment duration, and load decrements. As a minimum, the following loading increments, decrements and duration shall be used.

Increment	Approximate Load (percent design)	Minimum Duration (min)	Maximum Duration (min)
Seat	< 9	0	N/A
1	17	15	60
2	33	15	60
3	50	15	60
4	67	15	60

5	83	15	60
6	100	15	60
7	117	60	120
8	133	15	60
9	150	15	60
10	100	N/A	N/A
11	66	N/A	N/A
12	33	N/A	N/A
13	0	N/A	N/A

D. With the exception of the load increment representing approximately 117% of the design maximum top of aggregate pier stress, all load increments shall be held for a minimum of 15 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 1 hour, whichever is occurs first.

E. The load increment that represents approximately 117% of the design maximum stress on the Aggregate Pier shall be held for a minimum of 60 minutes. Loads are then maintained until the rate of deflection reduces to 0.01 inch per hour or for the maximum of 4 hours, whichever is occurs first.

F. A seating load equal to 5 percent of the total load shall be applied to the loaded steel plate prior to application of load increments and prior to measurement of deflections to compensate for surficial disturbance.

G. At least one rigid inclusion load test shall be performed on rigid inclusions in accordance with ASTM D 1143 to maximum load test of 200% of the design load at increments of 25% of the design load, when applicable.

H. The location of the aggregate pier modulus test and the rigid inclusion load test shall be approved by the geotechnical engineer.

I. Submit as-built plans showing layout, location, and numbers of installed aggregate piers.

3.05 BOTTOM STABILIZATION TESTING (BSTS) / CROWD STABILIZATION TESTING (CSTs)

A. Bottom stabilization testing (BSTs) or Crowd stabilization testing (CSTs) shall be performed during the installation of the modulus test pier and be observed by the Quality Control Representative and the Owner's geotechnical engineer. The tests are performed by applying downward vertical energy to the tamper, mandrel or probe following lift construction and monitoring the amount of additional deflection from the applied energy. Additional testing as required by the Architect (typically 10% of the production Aggregate Piers) shall be performed on selected production Aggregate Pier elements to compare results with the modulus test pier.

3.06 FIELD QUALITY ASSURANCE

A. The Owner will retain the geotechnical engineer to provide full-time monitoring of aggregate pier and/or rigid inclusion construction activities, including observing the aggregate pier modulus test and/or the rigid inclusion load test.

3.07 SITE PREPARATION AND PROTECTION

A. The Site Contractor shall locate and protect underground and aboveground utilities and other structures from damage during installation of the aggregate piers and/or rigid inclusions.

B. Site grades for aggregate pier and/or rigid inclusion installation shall be a minimum of 2 feet below the finished grade elevation to minimize aggregate pier and/or rigid inclusion installation depths. Ground elevations and bottom of footing elevations shall be provided to the aggregate pier and/or rigid inclusion Installer in sufficient detail to estimate installation depth elevations to within 3 inches.

C. The Owner's Site Contractor will provide site access to the Installer, after earthwork in the area has been completed. A working surface shall be established and maintained by the Owner's Site Contractor to provide wet weather protection of the subgrade and to provide access for efficient operation of the aggregate pier and/or rigid inclusion installation.

D. Prior to, during and following aggregate pier and/or rigid inclusion installation, the Owner's Site Contractor shall provide positive drainage to protect the site from wet weather and surface ponding of water.

E. If spoils are generated by aggregate pier and/or rigid inclusion installation, spoil removal from the aggregate pier and/or rigid inclusion work area shall occur in a timely manner to reduce the potential for interruption of aggregate pier and/or rigid inclusion installation is required.

F. The installer shall coordinate with Owner's Site Contractor the installation of support of excavation (SOE) system if required. The purpose of this coordination is to plan the workflow and avoid down time during construction.

G. The Owner's Site Contractor shall perform test pits within the areas slated for ground improvements to explore for the presence and remove obstructions.

H. The Owner's Site Contractor shall monitor vibration through installation of seismographs at the nearby buildings during installation of aggregate piers and/or rigid inclusions.

3.08 AGGREGATE PIER AND/OR RIGID INCLUSION LAYOUT

A. The location of aggregate pier and/or rigid inclusion supported foundations and slabs for this project, including layout of individual aggregate pier and/or rigid inclusion shall be marked in the field using survey stakes or similar means at locations shown on the drawings. The layout of aggregate piers and/or rigid inclusions shall be part of the base bid.

3.09 EXCAVATIONS FOR OBSTRUCTIONS

A. The existing fill may include below-ground structures and/or obstructions that need to be pre-trenched. Should any obstruction be encountered during aggregate pier and/or rigid inclusion installation, the Owner's Site Contractor shall be responsible for promptly removing such obstruction, or the aggregate pier and/or rigid inclusion shall be relocated or abandoned. Obstructions include, but are not limited to, abandoned utilities, existing and abandoned foundations or concrete structures, asphalt, demolition debris, cobbles, boulders, wood, metals, and other below-ground structures, and underground tanks which shall prevent placing the aggregate piers and/or rigid inclusions to the required depth or shall cause the pier to drift from the required location.

B. The specialty subcontractor shall mobilize an auger and equipment necessary to spin the auger in the ground to pre-auger and/or remove obstructions as needed.

C. Dense natural rock or weathered rock layers shall not be deemed obstructions, and aggregate piers and/or rigid inclusions may be terminated short of design lengths on such materials.

Dense rock or weathered rock are not anticipated within the proposed depths of the aggregate piers and/or rigid inclusions.

D. The cost of pre-trenching and/or auguring shall be part of the base bid and there shall be no separate compensation for pre-trenching and/or auguring prior to installing aggregate piers and/or rigid inclusions.

3.10 UTILITY EXCAVATIONS

A. The Owner's Site Contractor shall coordinate all excavations made prior and subsequent to aggregate pier and/or rigid inclusion installations so that excavations do not encroach on the aggregate piers and/or rigid inclusions as shown in the aggregate pier construction drawings.

B. Protection of completed aggregate piers and/or rigid inclusions is the responsibility of the Owner's Site Contractor. If utility excavations are required in close proximity to the installed aggregate piers and/or rigid inclusions, the Owner's Site Contractor shall contact the aggregate pier and/or rigid inclusion Designer immediately to develop construction solutions to minimize impacts on the installed aggregate pier and/or rigid inclusion elements.

C. The Owner's Site Contractor shall repair damaged aggregate piers and/or rigid inclusions in accordance with procedure included in specialty subcontractor's submittal.

3.11 FOOTING BOTTOMS

A. Excavation and surface compaction of all improved subgrades shall be the responsibility of the Owner's Site Contractor.

B. Foundation excavations to expose the tops of aggregate pier and/or rigid inclusion shall be performed with a smooth edge bucket in a workman-like manner, and shall be protected, until the LTP is built on top of the aggregate piers and/or rigid inclusions, with procedures and equipment best suited to (1) avoid exposure to water, (2) prevent softening of the matrix soil between and around the aggregate piers and/or rigid inclusions before building the LTP, and (3) achieve direct and firm contact between the dense, undisturbed aggregate piers and/or rigidi inclusions and the LTP.

C. The proposed footings shall be supported on a minimum of 6 inches of Structural Fill or 3/4-inch crushed stone wrapped in a filter fabric placed directly over aggregate piers. The Structural Fill or crushed stone layer shall be thicker if required for the LTP installed in accordance with the requirements of the specialty subcontractor.

D. All excavations for footing bottoms supported by aggregate pier and/or rigid inclusion improved subgrades shall be prepared in the following manner by the Owner's Site Contractor. Recommended procedures for achieving these goals are to:
   1. Limit over-excavation below the bottom of the footing to 3-inches (including disturbance from the teeth of the excavation equipment).
   2. Compaction of surface soil and top of Aggregate Piers and/or Rigid Inclusions shall be prepared using a large vibratory plate compactor. Motorized impact compactors ("Wacker Packer," "Jumping Jack," or similar) shall only be used in cohesive soils and when approved by the Designer. Loose or soft surficial soil over the entire footing bottom shall be recompacted or removed, respectively. The surface of the aggregate pier and/or rigid inclusion shall be recompacted prior to completing footing bottom preparation.
   3. Place footing concrete immediately after footing excavation is made and approved, preferably the same day as the excavation. Footing concrete must be placed on the same day if the footing is bearing on moisture-sensitive soils. If same day placement of

footing concrete is not possible, open excavations shall be protected from surface water accumulation. A lean concrete mud-mat may be used to accomplish this. Other methods must be pre-approved by the Designer.

4. The aggregate piers and/or rigid inclusions shall be visible before placing Structural Fill or crushed stone over the top of the APs and/or RIs. Such Structural Fill or crushed stone shall not be placed until the geotechnical engineer has observed the subgrade.

E. The following criteria shall apply, and a written inspection report sealed by the Engineer shall be furnished to the Installer to confirm:
1. That water has not been allowed to pond over the aggregate pier and/or rigid inclusion subgrade at any time. This statement shall be provided by the Owner's Site Contractor.
2. That all aggregate piers and/or rigid inclusions designed for each structure have been exposed in the footing excavation or prior to fill placement.
3. That immediately before footing construction or fill placement, the tops of aggregate piers and/or rigid inclusions have been inspected and recompacted as necessary with mechanical compaction equipment.
4. That no excavations (elevator, pits, or trenches) have been made after installation of aggregate pier and/or rigid inclusion elements within the excavation limits described in the aggregate pier and/or rigid inclusion construction drawings, without the written approval of the Installer or Designer.

3.12 SLAB SUBGRADES

A. Slabs-on-grade shall be supported on a minimum of 12 inches of Structural Fill placed directly over aggregate piers. The Structural Fill layer shall be thicker if required for the LTP installed in accordance with the requirements of the specialty subcontractor.

B. The aggregate piers and/or rigid inclusions shall be visible before placing Structural Fill or crushed stone over the top of the APs or RIs. Such Structural Fill or crushed stone shall not be placed until the geotechnical engineer has observed the subgrade.

3.13 VIBRATION MONITORING

A. The Owner's Site Contractor shall perform vibration monitoring during installation of aggregate piers. The peak particle velocity should be less than two (2) inches per second (ips) for concrete foundations, 1 ips for masonry foundations, and 0.5 for rubble foundations.

3.14 UNIT PRICES

A. All unit prices must be coordinated and approved by Owner's Project Manager, Peregrine Group LLC., Rumford, Rhode Island.

B. For cost estimating purposes, aggregate piers/rigid inclusions shall be assumed on average to be 48 feet long. For average aggregate piers/rigid inclusions length that are shorter than 48 feet, a credit shall be provided in accordance with item 3.17 C.6. For piers that are on average longer than 48 feet, the Contractor shall be compensated for a portion of the total length of aggregate piers/rigid inclusions in excess of length calculated based on an average length of 48 feet in accordance with item 3.17 C.7.

C. Payment shall include all costs for design and installation of the aggregate piers and in accordance with requirements of the Contract Documents. Payment for the Work of this Section shall be made following approval by the Owner in accordance with requirements of the Contract Documents, and the following Schedule:

Design of the aggregate piers shall be part of the base bid.

1. Unit Price for additional installed aggregate piers or rigid inclusion (w/o remobilization):
   $_____ Lump Sum
2. Unit Price Credit for aggregate piers or rigid inclusion not installed:
   $_____ Lump Sum
3. Unit Price for additional Modulus Tests (w/o remobilization):
   $_____ Lump Sum
4. Credit per foot for difference between actual length and length of aggregate piers/rigid inclusions based on average length of 48 feet and actual length for piers.
5. Unit Price per foot difference between actual length and length of aggregate piers/rigid inclusions based on average length of 48 feet and actual length for piers.
6. Unit Price for additional Mobilizations
   $_____ Each

END OF SECTION 31 60 00