



Central Falls High School

100% Construction Documents

Central Falls, RI

Ai3 Project #2202.02

Addendum #11

February 13, 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 11) must be entered in the appropriate spaces provided on the Bid Form.

CLARIFICATIONS:

ADD 11-001 **Bidder Question:** Specification Section 9 84 00 – Acoustical Room Components lists three types of AWP's but they are all labeled Type xx. They do not seem to match up with what is shown on the drawings (AWP type 1 and type 2). Example is the student commons. The spec mentions the Student Commons in para 2.2A and 2.2.C but the drawings only reference AWP type 1 (colors 1 and 2.0). Please clarify the types of wall panels that match up with the drawings. **Response:** Refer to attached specifications for Section 09 84 00 – Acoustic Room Components for updated acoustical wall and ceiling panel descriptions.

ADD 11-002 **Bidder Question:** CTE Room 310 calls for Felt Acoustical Wall Panels Type 1 – Colors 5 and 6. We can not seem to cross reference them with the specification. Please provide a spec on the felt type acoustical wall panels or clarify accordingly. **Response:** Refer to attached specifications for Section 09 84 00

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– Acoustic Room Components for updated acoustical wall and ceiling panel descriptions.

ADD 11-003 **Bidder Question:** Specification section 09 84 00 – Para 2.3 is titled Acoustical Wood Fiber Ceilings but the only product listed are the pyramidal ceiling diffusers. There are also ceiling diffusers specified in section 09 51 00 Acoustical Ceilings – Para 2.4.F, ACT -6. Please confirm which specification section is to be utilized for the ceiling mounted Pyramidal panels. **Response:** Refer to attached specifications for Section 09 84 00 – Acoustic Room Components for updated acoustical wall and ceiling panel descriptions. Refer to updated drawings for keynote clarification.

ADD 11-004 **Bidder Question:** Drawings indicate ACT Tectum ceiling panels – Type 1 at the gymnasium ceilings. Is the intent to have fabric covered ceiling panels at the gym ceiling or exposed Tectum panels painted? **Response:** Refer to attached specifications for Section 09 84 00 – Acoustic Room Components for updated acoustical wall and ceiling panel descriptions.

ADD 11-005 **Bidder Question:** Spec Section 12 24 00 Window Shades, para 2.1.A notes where each type of shade is to be used. Blackout Shades (manual) are noted to be located in the Science CR, Science Prep, Art Computer Lab, Drama Theater CR, Lang Lab and Proj Team Rooms (where indicated). All of these rooms on the enlarged floor plans and/or elevations only call for a manual roller shade(KN 12 24 00.01). The only locations that have the KN 12 24 00.11, manual blackout shades are the Media Commons 313 and 415. Please clarify we are to follow the keyed notes. **Response:** Refer to attached specifications for Section 12 24 00 – Window Shades for clarifications for locations to align with drawings.

ADD 11-006 **Bidder Question:** The Geotech Report provided in the documents determined that the existing soils are unsuitable for supporting foundations with existing fill, peat and organic soils extending deeper than 20 ft. This report suggests the existing soils to be improved through ground improvements (aggregate piers and/or rigid inclusions). Addendum #6 issued a specification for Ground Improvements as well as a revised Earthwork Section. Earthwork 31 00 00/3.1/B.1 calls for the removal of all unsuitable materials up to the depths shown in the geo tech report as part of the base bid and states it will not be considered an unanticipated soil condition. Please confirm that the contractor is not required to remove all unsuitable

materials to the depths shown in the Geotech and the existing soils are to be improved via ground improvements. Additionally, para 3.3/A also calls for removal of all “surficial organic soil” within the proposed building footprint. Please confirm the GC will not be required to remove organic soils within the building footprint up to depths shown in the Geotech Report. **Response:** Specification Section 31 00 00, Paragraphs 1.2A, 1.23, and 3.1B have been revised to provide clarification regarding the extent of unsuitable soil removal.

ADD 11-007 **Bidder Question:** Addendum #6 Earthwork section 31 00 00 para 1.23 calls for a 1'-0" strip over the existing site. This section goes on to then call for a registered land surveyor to perform an unsuitable soils survey in 20' grid increments at the bottom of this 1' strip and goes on to call for removal of unsuitable soils as shown in the contract documents or as directed in field by Geotech Engineer. The Geotech report calls for the existing unsuitable soils to be improved via ground improvements, please confirm that the 20' grid survey for unsuitable and the removal of such unsuitable material is not required and existing soils are to be improved via ground improvements. **Response:** The unsuitable soils survey remains a requirement at 20' grid increments. Specification Section 31 00 00, 1.23A. has been revised to strip vegetation, topsoil to a minimum depth of 6 inches. Specification Section 31 00 00, 1.2A has been revised to state, “Where ground improvements are installed, the existing fill and underlying organic soil shall be removed above the top of the ground improvements.”

ADD 11-008 **Bidder Question:** Addendum #6 Earthwork section 31 00 00 para 1.2A.4 calls for pre-trenching to remove obstructions prior to the start of ground improvements. Please provide more detail as to the extents of this pre-trenching. **Response:** Section 31 00 00, Part 1.2A.4 has been revised to provide clarification.

ADD 11-009 **Bidder Question:** Addendum 6 issued a new Earthwork section and Unit Price Form. There is conflicting information between the two as to the quantity required to be carried in the Rock Allowance. Unit Price Form calls for 100 cy of Excavation of Open Rock Removal, Earthwork Section 3.8/D calls for 20 cy of open rock removal and 20 cy of trench rock removal. Please clarify. **Response:** Section 31 00 00, Part 3.8D and Unit Price Form have been revised to include 100 cu yd of open rock removal and 100 cy of trench rock removal. Section 31 00 00 3.7O and the Unit Price Form have been revised to include

removal and disposal of Contaminant Impacted Soil, including 3,600 cu yd of Alternate Cover Soils and 700 cu yd of Solid Waste Soils in accordance with RIRRC criteria. Petroleum Contaminated Soils have been removed from the specification and Unit Price Form

ADD 11-010 **Bidder Question:** Please confirm if the existing topsoil can be stockpiled for reuse on site as long as it meets the requirements of the specification. Earthwork 3.6/l states “the reuse of onsite soil shall not be permitted within one foot of finished grade”. Spec section Site Preparation and Clearing para 3.5 leads you to believe that the topsoil can be reused on site. **Response:** All reuse of existing on-site soils shall be in accordance with the capping requirements set forth in the RAWP. Gradation requirements for re-use shall be in accordance with Section 31 00 00 of the specifications and the Geotechnical Report.

ADD 11-011 **Bidder Question:** Please refer to Section 1.02.A of Specification 31 60 00 states that “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.” The extent of ground improvement support for the site retaining walls, sidewalk, utility structures, and 48-inch combined sewer pipes could be open to interpretation here. Please provide a sketch highlighting all exterior features that require support such that ground improvement bids may be leveled. **Response:** Ground improvements will be installed under the following items to be installed within the limit of work:

- All building foundations and slabs;
- All stairs, access ramps, retaining walls, and sidewalks attached/connected to buildings;
- All utility structures, including catch basins, manholes, transition chambers, area drains, water treatment practice structures and underground vaults of any type;
- All concrete pads;
- Full length of all 48” pipe;
- Full length of all culverts and associated wingwalls; 18” drain pipe from DMH-304 to DMH-313; 24” drain pipe from DMH-317 to DMH-313

ADD 11-012 **Bidder Question:** Please clarify which utility structures ground improvements will be required under. Drain Manholes, Catch Basins and Area Drains? Every structure on site? Also, please

confirm that the structures installed along Lonsdale and Higginson will require ground improvements. **Response:** Refer to the response to ADD-11-011

ADD 11-013 **Bidder Question:** Please confirm any plantings shown on LP1.24 are to be part of Alternate 10. The drawing sheet is titled "Base Bid". **Response:** LP1.24 is part of Alternate 10 - the sheet title has been changed, see attached.

ADD 11-014 **Bidder Question:** The specifications include section 32 91 04 – Soil Preparation for Athletic Fields. Please clarify where this section applies. **Response:** This section applies to the open lawn area where the throwing events occur. See attached sheet LP1.01 for call out showing the area to receive this treatment.

ADD 11-015 **Bidder Question:** Drawings LP1.22 & LP1.23 are titled "Alternate 10" but the wetland seed mix required at the bioretention basins and the open channel ponds is shown on these sheets and no where else. Please confirm the wetland seed mix for both of these areas are to be included as part of the base bid. **Response:** Bioretention basins are included in the base bid work and so, seeding of those areas should be included in the base and not Alternate 10. See attached sheets LP1.21 and LP1.22 for corrections in the center of the site. Please note that due to changes in the grading and drainage plans (see Civil drawings) the bioretention area at the southern end of the site has been eliminated and a grassed swale will take its place. Please see sheet LP1.23 to see changes to tree counts and the elimination of wetland seeding in this area. Additionally, please see sheets L1.22 and L1.22A for changes to the swale which also include a change to the quantity of split-rail fencing and a change to the location of the gate on the southwest corner of that fence.

ADD 11-016 **Bidder Question:** For the NBC combined system work – can you provide the average and maximum daily flow? Can you provide more of a system-wide site plan of the existing NBC system? Looking for upstream and downstream manholes for bypass work. **Response:** Dry weather flow is not anticipated in the twin 48" combined sewer pipes as they receive flow from a regulator structure (overflow weir) on Emmett Street as well as several storm drain connections. With flow being associated with wet weather conditions, average/maximum daily flows are not applicable to the twin 48" combined sewer pipes. The is limited flow data available for the twin 48" pipes. NBC performed flow monitoring at the regulator structure in 2004, 2005, and 2007

with the resultant data shown below. It should be noted that this flow data excludes downstream flow to the twin 48" pipes (12" from Site entrance, 12" from Lonsdale Ave, 24" from Lonsdale Ave, 12" from Orchard Street).

NBC Flow Data Summary

Monitoring Period	Number of overflows	Maximum Peak Flow (MGD)
1/1/04 to 12/30/04	40	30.16
1/1/05 to 10/15/05	29	30.18
1/1/07 to 10/11/07	16	33.8

This information is provided for reference only. The Contractor shall be responsible for providing and maintaining the capability to bypass all flows through the system at all times when the pipeline is disrupted during construction. A supplemental figure has been provided showing the approximate upstream location of the regulator structure and piping. Additionally, Note 35 on Sheet C1.0 has been revised accordingly

ADD 11-017 **Bidder Question:** Please provide more information on the existing twin 48" combination lines to be relocated, more so information from where they come through Higginson Ave to the structure shown on C1.0 North of the playground called for to be protected. On sheet C1.0 and a provided Narragansett Bay Commission Sketch SK-1 dated 10/18/2018, there appears to only be one 24" line coming out of the North end of this structure running up to Higginson where it appears to make a turn and head North East. **Response:** A supplemental figure has been provided showing the approximate upstream location of the regulator structure and piping. Record plans indicate a 24" inch drain from Lonsdale Avenue enters the system north of the structure identified to be protected and adjusted to grade. This 24" pipe is proposed to be disconnected from the combined sewer as part of the project.

ADD 11-018 **Bidder Question:** Upright sprinkler protection is shown throughout the entire building, including in areas above finished ceilings. The new construction is entirely of non-combustible steel construction. Please confirm if all of the uprights shown are intended, even in areas of concealed, non-combustible construction. **Response:** Sprinkler protection to be provided above ceilings. Sprinkler protection is provided to eliminate the requirement of Heat detection system above ceilings which is required by the RI Fire code.

- ADD 11-019** **Bidder Question:** Please refer to sheet P1.10C, Underground Piping – Zone C, which directs you to enlarged plan 1/P3.06 for the under-slab piping requirements at the locker room. South of Column line B5 on 1/P3.06 there is a note “see P1.10C for continuation”. P1.10C does not show any under slab piping South of Column line B5. Also note, there appears to be a floor drain in Trash Room 130, which is South of Column Line B5 which is also not picked up on P1.10C. Please provide more information. **Response:** Refer to attached drawings for piping for floor drain. Please note there is also an additional (2) floor drains in the adjacent fire pump room which have been added, refer to attached drawings.
- ADD 11-020** **Bidder Question:** A window sub is requesting clarification on the Low E Coating. It appears there are two different types described. Glass Type A describes a Low-E sputter coating on a number 2 surface. Glass Type D describes a Low-E sputtered triple silver softcoat on a number surface. Should there be one type of Low-E used through-out the project? **Response:** Glass Type D and Glass Type A have the same Low-E coating – the text for Glass Type D is just more descriptive. All the exterior glass types should have the same low-E sputtered triple silver softcoat.
- ADD 11-021** **Bidder Question:** Will you require Low-E coating on the spandrel glass that has back pans? **Response:** Yes, all the exterior glass types should have the same low-E sputtered triple silver softcoat. This is to provide a consistent appearance to the glass when view from the exterior.
- ADD 11-022** **Bidder Question:** There are inconsistencies between the Spec 054000 and Structural notes on S0.01. Please advise which we should be using for this project. **Response:** The information as shown on drawing S0.01 is correct and the specifications will be updated in a subsequent addendum.

SPECIFICATIONS:

- ADD 11-023** Document 00 01 10 "Table of Contents"; REMOVE in entirety and REPLACE with new Document 00 01 10, dated February 13, 2024, Addendum #11.
- ADD 11-024** Document 00 43 22 "Bid Attachment – Unit Prices Form" REMOVE in entirety and REPLACE with new Document 00 43 22, dated February 13, 2024, Addendum #11.
- ADD 11-025** Section 01 14 00 "Work Restrictions"; Attachment A – "Worker BCI Disqualification Matrix"; REMOVE in entirety and REPLACE with new Section 01 14 00 Attachment A, dated February 13, 2024, Addendum #11.
- ADD 11-026** Section 09 84 00 "Acoustical Insulation"; REMOVE in entirety and REPLACE with new Section 09 84 00, dated February 13, 2024, Addendum #11.
- ADD 11-027** Section 12 24 00 "Window Shades"; Article 2.1, Paragraph A, subparagraph 3, DELETE the words "Science prep, Science classrooms, Art Computer Lab, Drama Theater Classroom, Language Laboratory and Project Team Rooms" and REPLACE with the words "Media Commons" as follows:
3. Blackout shades: ~~Science prep, Science classrooms, Art Computer Lab, Drama Theater Classroom, Language Laboratory and Project Team Rooms~~ **Media Commons** (where indicated): Draper, product: "Lightbloc" shades, manually operated. **[ADD #11]**
- ADD 11-028** Section 12 24 00 "Window Shades"; Article 2.1, Paragraph A, subparagraph 4, DELETE the words "Lecture Hall" and REPLACE with the word "Band" as follows:
4. Blackout shades: ~~Lecture Hall~~ **Band**: Draper, product: "Lightbloc" shades, electrically operated with Draper "Intelliflex" control system. **[ADD #11]**
- ADD 11-029** Section 31 00 00 "Earthwork"; REMOVE in entirety and REPLACE with new Section 31 00 00, dated February 13, 2024, Addendum #11.
- ADD 11-030** Section 31 60 00 "Ground Improvements"; REMOVE in entirety and REPLACE with new Section 31 60 00, dated February 13, 2024, Addendum #11.

DRAWINGS:

- ADD 11-031** C1.0 – EXISTING CONDITIONS AND DEMOLITION PLAN
- ADD 11-032** C3.0 GRADING PLAN
- ADD 11-033** L1.01 – OVERALL SITE REFERENCE
- ADD 11-034** L1.22 – HARDSCAPE PLAN BASE BID

- ADD 11-035 L1.22A – HARDSCAPE PLAN ALTERNATE 6
- ADD 11-036 LP1.01 – OVERALL PLANTING PLAN
- ADD 11-037 LP1.21 – PLANTING PLAN BASE BID
- ADD 11-038 LP1.22 – PLANTING PLAN ALTERNATE 10
- ADD 11-039 LP1.23 – PLANTING PLAN ALTERNATE 10
- ADD 11-040 LP1.24 – PLANTING PLAN ALTERNATE 10
- ADD 11-041 A0.02 – MASTER KEYNOTE LIST
- ADD 11-042 A10.51 – BAND CLASSROOMS ENLARGED PLAN AND INTERIOR ELEVATIONS
- ADD 11-043 A10.52 – CHORUS CLASSROOMS ENLARGED PLAN AND INTERIOR ELEVATIONS
- ADD 11-044 FP1.14A – FIRE PROTECTION FOURTH FLOOR PLAN – ZONE A
- ADD 11-045 FP6.01 – FIRE PROTECTION DETAILS
- ADD 11-046 P1.10C – PLUMBING UNDERGROUND PIPING – ZONE C
- ADD 11-047 P1.11C – PLUMBING FIRST FLOOR WASTE & VENT PLAN – ZONE C
- ADD 11-048 P2.11C – PLUMBING FIRST FLOOR WATER PIPING PLAN – ZONE C
- ADD 11-049 P3.06 – PLUMBING ENLARGED LOCKER ROOM FLOOR PLANS
- ADD 11-050 ES.05 – ELECTRICAL SITE DETAILS
- ADD 11-051 E2.11C – ELECTRICAL FIRST FLOOR POWER PLAN – ZONE C
- ADD 11-052 E5.05 – ELECTRICAL PANEL SCHEDULES
- ADD 11-053 E5.08 – ELECTRICAL PANEL SCHEDULES

ATTACHMENTS:

- ADD 11-054 00 01 10 – TABLE OF CONTENTS
- ADD 11-055 00 43 22 – BID ATTACHMENT – UNIT PRICES FORM
- ADD 11-056 01 14 00 – WORKER BCI DISQUALIFICATION MATRIX – ATTACHMENT A
- ADD 11-057 09 84 00 – ACOUSTIC ROOM COMPONENTS
- ADD 11-058 31 00 00 – EARTHWORK
- ADD 11-059 31 60 00 – GROUND IMPROVMENTS
- ADD 11-060 TBD Supplemental Information for Combined Sewer to NBC

NOTES:

- EXISTING UTILITY INFORMATION SHOWN HEREON IS BASED ON THE DESIGN DRAWINGS AND RECORD INFORMATION. CONDITIONS, DEEPS, AND BERTHS OF UTILITIES HAVE NOT BEEN SURVEYED IN THE FIELD. EXISTING SITE ELEVATION DATA UPDATED BASED ON SURVEY PLAN (CAD ONLY) PROVIDED BY INSITE ENGINEERING SERVICES ON DECEMBER 11, 2023.
- DEMOLITION OF EXISTING BUILDING AND SITE FEATURES ARE INCLUSIVE OF ALL PHASES. PROPOSED DEMOLITION ACTIVITIES SHOWN ON THESE SHEETS ARE NOT INTENDED TO INDICATE THE PHASE IN WHICH THEY OCCUR. SEE PHASING DRAWINGS FOR DEMOLITION SPECIFIC TO PHASING.
- ALL EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF ANY EARTH MOVING ACTIVITIES.
- THE EROSION AND SEDIMENTATION CONTROLS SHOWN ON THE PLANS ARE INTENDED TO REPRESENT THE MINIMUM CONTROLS NECESSARY TO MEET ANTICIPATED SITE CONDITIONS. ADDITIONAL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- INSTALL EROSION CONTROLS DOWNSTREAM OF ANY DISTURBED AREAS TO REDUCE POTENTIAL FOR EROSION. CONTRACTOR SHALL INDICATE LOCATIONS OF EROSION CONTROLS FOR REVIEW WITH GENERAL CONTRACTOR AND OWNER'S PROJECT MANAGER PRIOR TO COMMENCING DISTURBANCE. EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LATEST REVISION OF THE RI SOIL EROSION AND SEDIMENT CONTROL HANDBOOK.
- INSTALL CHAIN LINK FENCE TREE PROTECTION AT THE LOCATIONS SHOWN ON THE PLAN TO PROTECT EXISTING TREES SPECIFICALLY INDICATED ON THE PLAN. LAYOUT OF FENCE SHALL BE REVIEWED AND APPROVED BY THE LANDSCAPE ARCHITECT. TREE PROTECTION SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF CONSTRUCTION.
- ALL EXISTING DRAINAGE SHALL BE MAINTAINED OR REROUTED AS NECESSARY UNTIL PERMANENT PIPING IS INSTALLED.
- ELECTRICAL DEMOLITION IS SHOWN FOR INFORMATION ONLY. REFER TO ELECTRICAL PLANS FOR COMPLETE EXTENT OF ELECTRICAL DEMOLITION.
- PROVIDE INLET PROTECTION AT ALL EXISTING DRAINAGE INLETS.
- ALL ITEMS TO BE REMOVED AND STOCKPILED SHALL BE COORDINATED WITH OWNER FOR STOCKPILE LOCATIONS. AT THIS TIME, THE OWNER HAS NOT IDENTIFIED ITEMS FOR STOCKPILE.
- ALL ITEMS MARKED FOR RE-USE SHALL BE STOCKPILED ONSITE, PROTECTED AND RE-INSTALLED AS SHOWN ON THE LANDSCAPE PLANS.
- DRAINAGE FEATURES AND UTILITIES TO BE MAINTAINED UNLESS OTHERWISE NOTED.
- TOTAL AREA OF DISTURBANCE: 2.3 ACRES.
- CONTRACTOR TO REESTABLISH BENCHMARKS IN ALTERNATE LOCATION PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL COORDINATE CLEARING OF ALL ABUTTER ENCROACHMENTS WITH THE CITY OF CENTRAL FALLS PRIOR TO CONSTRUCTION.
- INSTALL CONSTRUCTION ENTRANCE AT ALL ENTRY/EXIT POINT FOR VEHICULAR TRAFFIC FOR EACH PHASE OF THE PROJECT.
- ALL EARTH DISTURBANCE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- ACTIVE UTILITY LINES (INCLUDING SEWER, WATER, AND DRAINAGE), CONTRACTOR SHALL PROVIDE 1 WEEK NOTIFICATION FOR ANY POSSIBLE DISRUPTION OF SERVICE TO OWNER, OWNER'S REPRESENTATIVE AND ARCHITECT; PROVIDE NOTIFICATION FOR CONNECTING, DISCONNECTING, TURNING ON OR TURNING OFF ANY SERVICE WHICH MAY AFFECT USERS OF THE RESPECTIVE UTILITY.
- CONTRACTOR SHALL PROVIDE 72 HOUR (3 WORKING DAYS) NOTICE TO LOCAL FIRE DEPARTMENT OF DISRUPTIONS.
- DISTURBANCE ON ACTIVE GAS LINES SHALL BE COORDINATED WITH UTILITY PROVIDER.
- THE CONTRACTOR SHALL CONFIRM LOCATION AND ELEVATION OF THE EXISTING DRAINAGE MANHOLES AND PIPES INDICATED. IT SHALL BE ASSUMED THAT AN ADDITIONAL 60 FEET OF PIPE WILL NEED TO BE REMOVED AND DISPOSED.
- ANY UNFORESEEN UNDERGROUND TRANSITE PIPE OR OTHER UNFORESEEN HAZARDOUS MATERIAL SHALL BE ABATED IN ACCORDANCE WITH THE SPECIFICATIONS AND ALL LOCAL, STATE AND FEDERAL REGULATIONS.
- CONTRACTOR SHALL COMPLY WITH ALL CHPS REQUIREMENTS FOR DEMOLITION.
- ALL EXISTING MANHOLES OR CATCH BASINS TO REMAIN SHALL BE ADJUSTED TO FINISHED GRADE ELEVATION.
- ALL EXISTING UTILITIES WITHIN TREE PROTECTION AREAS NOT SCHEDULED FOR RE-USE SHALL BE CUT, CAPPED, AND ABANDONED IN PLACE.
- DEMOLITION WORK SHOWN ON THIS SHEET IS INDEPENDENT OF PROJECT PHASING OR SEQUENCING. CONTRACTOR SHALL BE RESPONSIBLE FOR SEQUENCING ALL WORK AS OUTLINED IN THE PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL SCHEDULE PRECONSTRUCTION MEETING WITH ARCHITECT, LANDSCAPE ARCHITECT, CIVIL ENGINEER, STRUCTURAL ENGINEER, AND OWNER'S PROJECT MANAGER PRIOR TO DEMOLITION OF EXISTING SERVICE AREA TO CONFIRM EXTENT OF DEMOLITION AND SAWCUT LOCATIONS.
- THE CONTRACTOR MUST CONTACT THE APPROPRIATE PRIVATE UTILITY COMPANIES AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK BEING COMPLETED. THE CONTRACTOR IS HEREBY NOTIFIED THAT SOME PUBLIC AND PRIVATE UTILITY COMPANIES ARE NOT PART OF "DIGSAFE" AND MAY HAVE ADDITIONAL NOTIFICATION REQUIREMENTS.
- CUT AND CAP EXISTING WATER AND SEWER SERVICES AT THE MAIN PRIOR TO ANY BUILDING DEMOLITION.
- USE OF FIRE HYDRANTS FOR DEMOLITION OR CONSTRUCTION IS NOT PERMITTED UNLESS APPROVED BEFOREHAND BY THE PAWTUCKET WATER SUPPLY BOARD.
- THE CONTRACTOR SHALL KEEP ON SITE, AT ALL TIMES, ADDITIONAL SILTATION FENCING AND FILTER FABRIC FOR INSTALLATION AS DIRECTED BY THE CITY TO MITIGATE ANY EMERGENCY CONDITIONS.
- CONTRACTOR TO CAMERA INSPECT AND LOCATE EXISTING SEWER AND DRAIN THROUGHOUT SITE.
- EXISTING SEWER AND DRAIN MUST REMAIN ACTIVE AT ALL TIMES.
- NO CONTRACTOR PARKING ON ROADWAYS.
- THE CONCRETE CULVERT AND TWIN 48" PIPES ARE PART OF AN ACTIVE COMBINED SEWER OVERFLOW SYSTEM. BASED ON A REVIEW OF LIMITED FLOW SUMMARY DATA FROM 2004-2007, PEAK FLOWS OF 400 MGD ARE ANTICIPATED DURING THE 1-YEAR RAINFALL EVENT. THIS INFORMATION IS PROVIDED FOR REFERENCE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING THE CAPABILITY TO BYPASS ALL FLOWS THROUGH THE SYSTEM AT ALL TIMES WHEN THE PIPELINE IS DISRUPTED DURING CONSTRUCTION. **IT IS ANTICIPATED THAT FLOWS OF UP TO 40 MGD MAY OCCUR DURING SIGNIFICANT WET WEATHER EVENTS. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN THE CAPABILITY TO BYPASS PUMP SUCH FLOWS AT ALL TIMES WHEN THE PIPELINE IS DISRUPTED FOR RE-ROUTING. BYPASS PUMPING SYSTEM SHALL INCLUDE BOTH PRIMARY AND BACKUP CAPACITY.**
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN THE CAPABILITY TO BYPASS PUMP FLOWS AT ALL TIMES WHEN THE EXISTING DRAINAGE SYSTEM IS DISRUPTED FOR RE-ROUTING. BYPASS PUMPING SYSTEM SHALL INCLUDE BOTH PRIMARY AND BACKUP CAPACITY.
- IRRIGATION SYSTEM INFORMATION HAS BEEN OBTAINED FROM THE "GRADING AND IRRIGATION PLAN" FROM WILFRID L. GATES JR LANDSCAPE ARCHITECT DATED DECEMBER 1975.
- BORING AND MONITORING WELL INFORMATION HAS BEEN OBTAINED FROM THE FOLLOWING:
 - PHASE I ENVIRONMENTAL SITE ASSESSMENT PREPARED BY SAGE ENVIRONMENTAL, INC. DATED NOVEMBER 8, 2021
 - SITE INVESTIGATION REPORT PREPARED BY SAGE ENVIRONMENTAL, INC. DATED MAY 2023
 - PRELIMINARY GEOTECHNICAL REPORT PREPARED BY LAH/AF GEOTECHNICAL CONSULTING, INC. DATED AUGUST 4, 2023
- LIGHT POLES AND FIXTURES AT THE EXISTING BASKETBALL COURTS AND THE EXISTING FLAG POLE SHALL BE REMOVED AND SALVAGED. THESE SHALL BE DELIVERED TO THE CENTRAL FALLS DPW AT 1280 HIGH STREET, CENTRAL FALLS, RI 02863.
- THE CONTRACTOR SHALL CLEAR AND GRUB ALL EXISTING VEGETATION WITHIN THE LIMITS OF DISTURBANCE UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RELATED TO DEWATERING EXCAVATION, BOTH FROM GROUNDWATER AND STORMWATER RUNOFF. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR DETERMINING FLOW RATES AND VOLUMES. DISCHARGE OF DEWATERING EFFLUENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RESPECTIVE AUTHORITY HAVING JURISDICTION.

ALTERNATE 2 - OUTDOOR FURNITURE: DEMOLITION 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. DEMOLITION WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE.

ALTERNATE 5 - FREIGHT FARM UNIT: DEMOLITION 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: DEMOLITION 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.

ADD-10

ADD-11

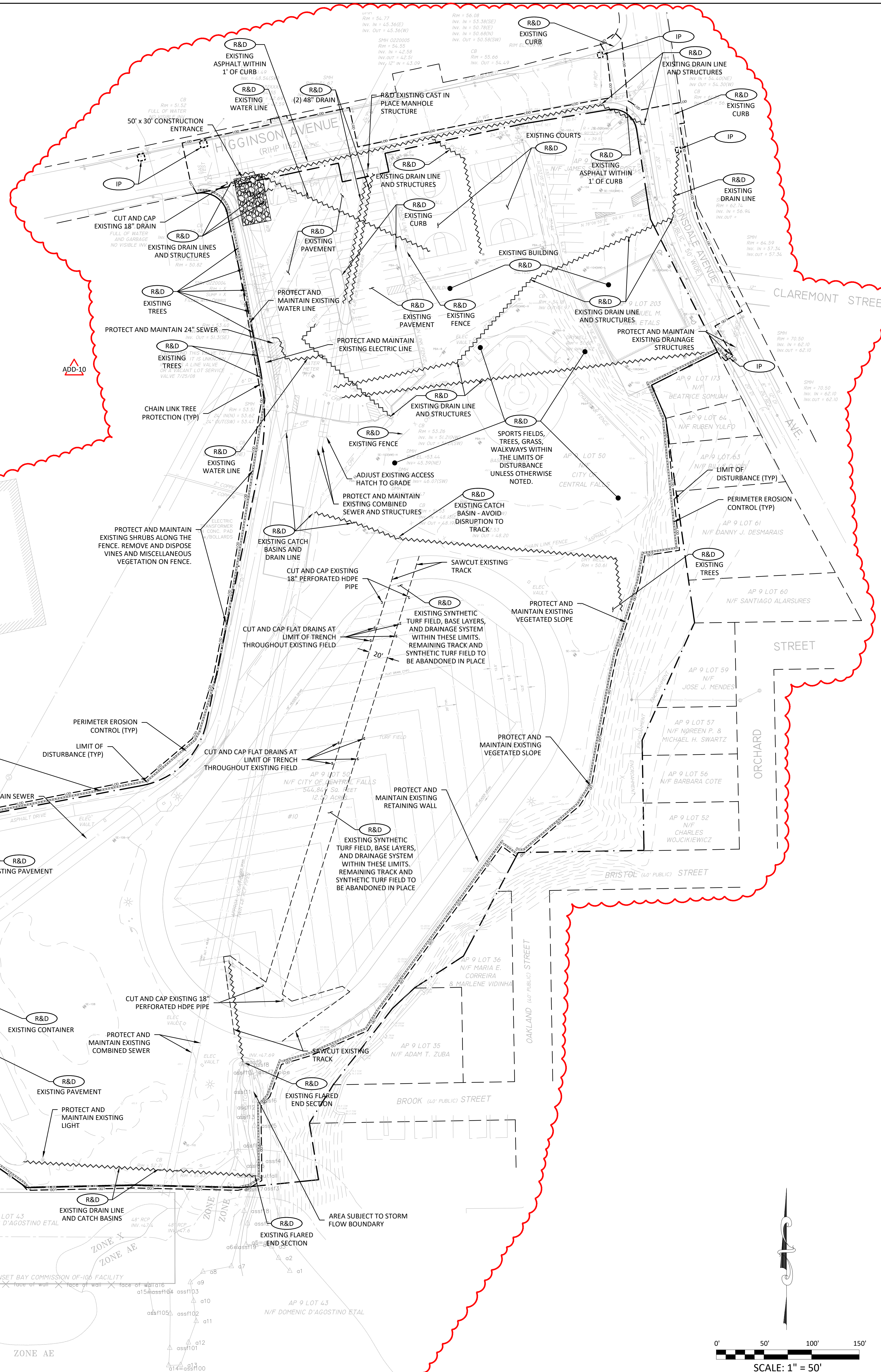
ADD-10

POINT ROAD

FLOODPLAIN BOUNDARY

100-FOOT JURISDICTIONAL AREA

50-FOOT BUFFER AREA



Ai3 ARCHITECTS
 526 Boston Post Rd, Weymouth, MA 02189
 508.358.0790 www.ai3architects.com

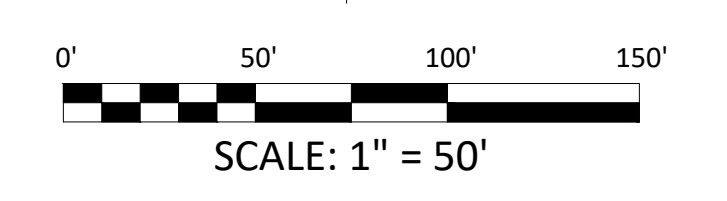
VERTEX
 The Vertex Companies, LLC
 400 Libbey Parkway, Weymouth, MA 02189
 PHONE 781.952.6000
 www.vertexeng.com

CENTRAL FALLS SCHOOL DISTRICT
 CENTRAL FALLS HIGH SCHOOL
 10 HIGGINSON AVE, CENTRAL FALLS, RI
 KEYNOTE LEGEND:

ADD-11 ADDENDUM #11 02.13.2024
 ADD-10 ADDENDUM #10 02.09.2024
100% CONSTRUCTION DOCUMENTS
 NORTH ARROW

KEYPLAN

DRAWING NAME:
EXISTING CONDITIONS AND DEMOLITION PLAN
 DRAWN BY: SMC
 REVIEWED BY: GBD
 SCALE: AS NOTED DRAWING NUMBER:
 JOB NO.: 77977
 DATE: OCTOBER 13, 2023
C1.0



GRADING NOTES:

- 1. PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MIN. OF 1/8" PER FOOT UNLESS SPECIFIED.
- 2. SITE GRADES SHALL CONFORM WITH ADA REQUIREMENTS. IN AREAS WHERE THESE REQUIREMENTS CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION.
- 3. ALL TRANSITIONS BETWEEN GROUND COVERING MATERIALS SHALL BE SMOOTH.
- 4. CROSS SLOPES FOR ALL WALKWAYS SHALL NOT EXCEED 2% AND RUNNING SLOPES FOR ALL WALKWAYS SHALL NOT EXCEED 5%.
- 5. REFER TO DRAINAGE PLANS FOR ALL DRAINAGE STRUCTURE RIM ELEVATIONS.
- 6. TOP OF WALL (TOW) AND BOTTOM OF WALL (BOW) ELEVATIONS SHOWN ON THIS PLAN INDICATE THE GROUND ELEVATION IMMEDIATELY ADJACENT TO THE WALL. REFER TO THE LANDSCAPE DRAWINGS FOR THE REVEAL HEIGHT OF EACH SITE WALL.

COST ESTIMATING NOTES: REMOVED FROM BID DOCUMENTS

- 1. IT IS ANTICIPATED THAT APPROXIMATELY 5,800 CUBIC YARDS OF MATERIAL WILL BE EXCAVATED FROM THE NORTHERN PORTION OF THE SITE AND THIS MATERIAL WILL BE UNSUITABLE FOR USE BELOW PROPOSED PAVED SURFACES AND STRUCTURES.
- 2. FOR COST ESTIMATING PURPOSES THE FOLLOWING IS ASSUMED:
 - 2.1. APPROXIMATELY 2,500 CUBIC YARDS OF THE MATERIAL WILL BE SPREAD THROUGHOUT THE SOUTHERN PORTION OF THE SITE, IN LOCATIONS WHERE THE PROPOSED FINISHED SURFACE IS TO BE UNPAVED/PERVIOUS. THIS IS ANTICIPATED TO BE AN APPROXIMATE DEPTH OF 1.5 FEET. THIS DEPTH WILL BE TAPERED DOWN AT THE PERIMETER OF THE WORK TO MEET EXISTING SURFACE ELEVATIONS.
 - 2.2. ONE FOOT (12 INCHES) OF IMPORTED MATERIAL WILL BE SPREAD ABOVE THIS REUSED ON-SITE MATERIAL. GEOTEXTILE WILL BE UTILIZED TO SEPARATE ON-SITE AND IMPORTED MATERIAL. IT IS ANTICIPATED THAT THE FINAL GRADE WILL BE APPROXIMATELY 2.5 FEET ABOVE THE EXISTING GRADE THROUGHOUT THE UNPAVED/PERVIOUS SURFACES ON THE SOUTHERN PORTIONS OF THE SITE. THIS DEPTH WILL BE TAPERED DOWN AT THE PERIMETER OF THE WORK TO MEET EXISTING SURFACE ELEVATIONS.
 - 2.3. IT IS ANTICIPATED THAT APPROXIMATELY 3,300 CUBIC YARDS OF EXCAVATED ON-SITE SOILS WILL BE TAKEN OFF-SITE FOR DISPOSAL.

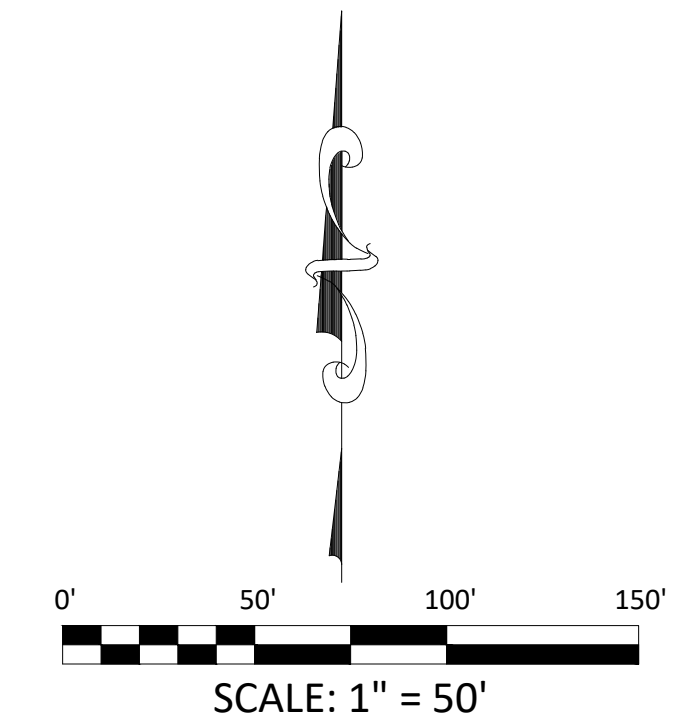
BID ALTERNATE NOTES:

- ALTERNATE 2 - OUTDOOR FURNITURE: GRADING 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. GRADING WORK SHOWN ON THIS SHEET IS ANTICIPATED TO BE CONSISTENT WITH BOTH THE BASE BID AND ALTERNATE.
- ALTERNATE 5 - FREIGHT FARM UNIT: GRADING 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: GRADING 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.



CROW POINT ROAD

ZONE X
ZONE AE



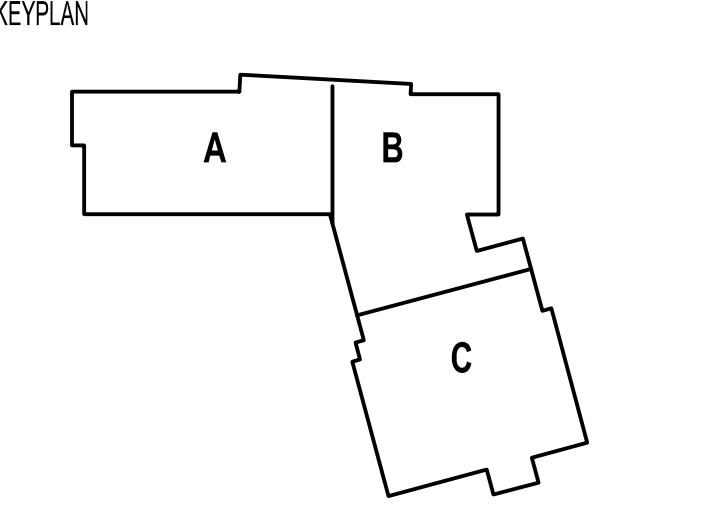
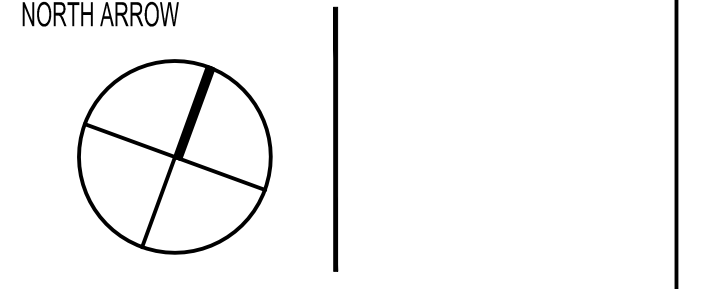
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CENTRAL FALLS HIGH SCHOOL
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KEYNOTE LEGEND:

ADD-11	ADDENDUM #11	02.13.2024
ADD-10	ADDENDUM #10	02.09.2024

100% CONSTRUCTION DOCUMENTS



DRAWING NAME:
GRADING PLAN
DRAWN BY: SMC
REVIEWED BY: GBD
SCALE: AS NOTED | DRAWING NUMBER:
JOB NO.: 77997 | **C3.0**
DATE: OCTOBER 13, 2023

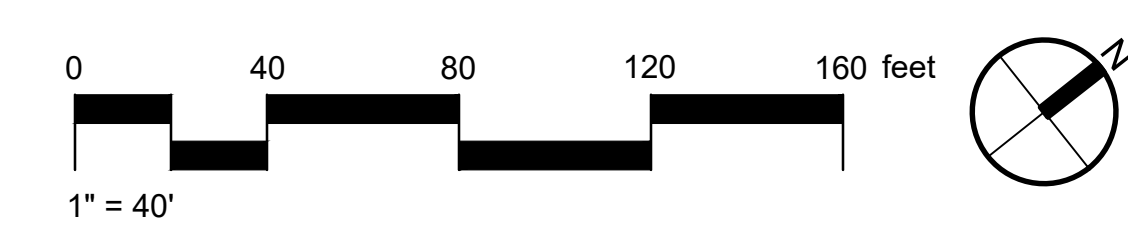
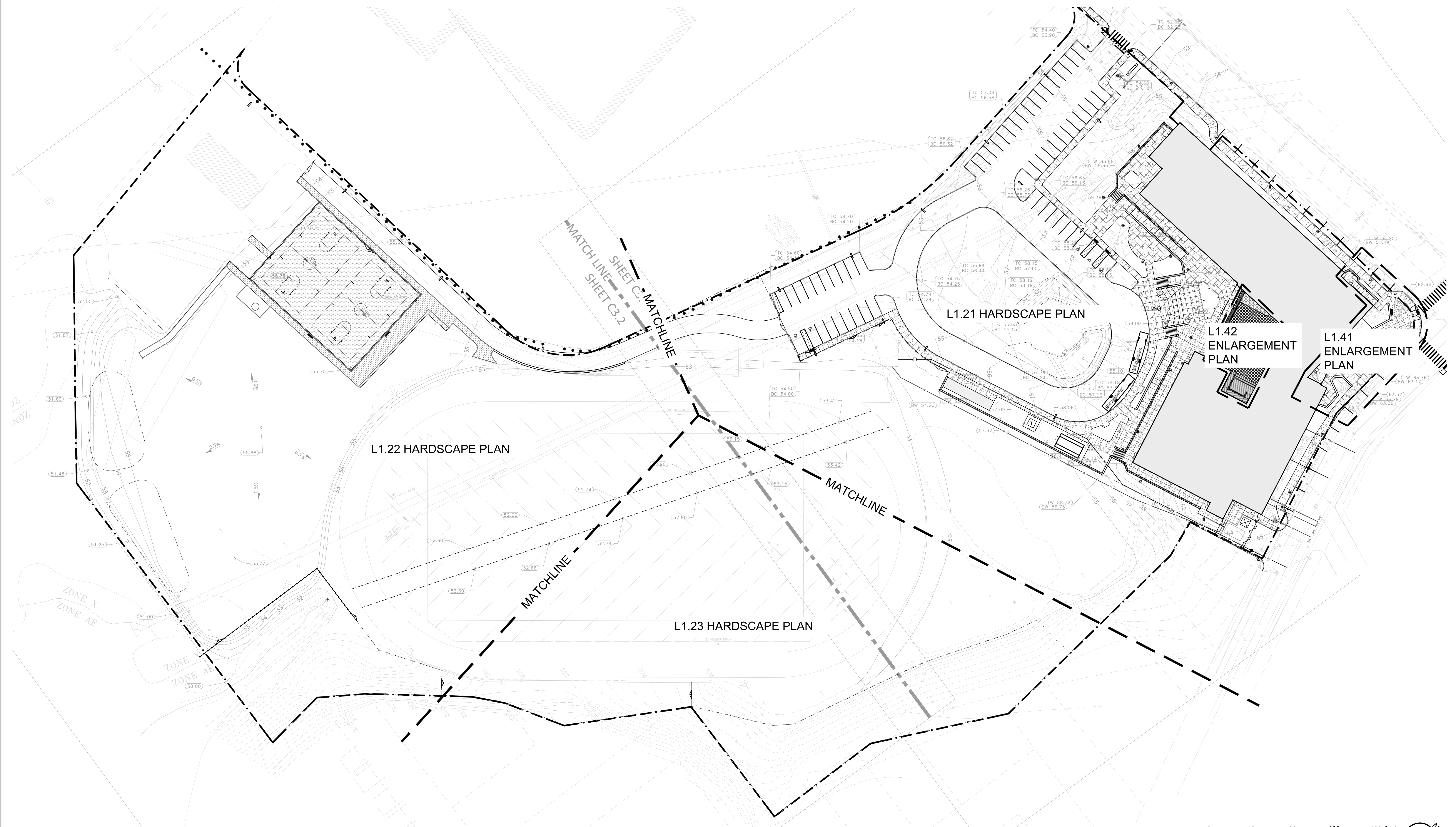
REFERENCE NOTES SCHEDULE

SYMBOL	WOOD FRAMING DESCRIPTION	QTY	DETAIL
	WOOD DECKING - SEE SHEET L3.15	585 sf	
SYMBOL	ASPHALT PAVING DESCRIPTION	QTY	DETAIL
	ASPHALT PAVING	12,793 sf	1/L3.12
	ASPHALT COURT PAVING	4,799 sf	3/L3.01
SYMBOL	CONCRETE PAVING DESCRIPTION	QTY	DETAIL
	CONCRETE PAVING	26,973 sf	1/L3.01
SYMBOL	UNIT PAVING DESCRIPTION	QTY	DETAIL
	UNIT PAVERS- TYPE A	1,940 sf	4/L3.14
	UNIT PAVERS- TYPE B	1,286 sf	4/L3.14
SYMBOL	FENCES AND GATES DESCRIPTION	QTY	DETAIL
	8' BLACK CHAIN LINK FENCE	2,438 lf	8/L3.01
	10' BLACK CHAIN LINK FENCE	440 lf	2/L3.12
	METAL PRIVACY FENCE	98 lf	1/L3.10
	METAL PRIVACY GATES	32 lf	1/L3.10

SYMBOL	FENCES AND GATES DESCRIPTION	QTY	DETAIL
	8' CHAIN LINK 20' WIDE DOUBLE GATE	3	9/L3.01
	8' CHAIN LINK 8' WIDE DOUBLE GATE	4	7/L3.01
	8' CHAIN LINK SINGLE GATE	1	6/L3.01
	10' FENCE CHAIN LINK SINGLE GATE	2	4/L3.12
	10' FENCE CHAIN LINK DOUBLE GATE	1	5/L3.12
	4' CHAIN LINK 10' WIDE DOUBLE GATE	2	10/L3.01
	SPLIT RAIL FENCE	194 lf	5/L3.01
SYMBOL	RETAINING WALLS DESCRIPTION	QTY	DETAIL
	SMALL RETAINING WALL	131 lf	2/L3.10
	PARAPET WALL	206 lf	3/L3.02
	RETAINING WALL	627 lf	2/L3.02
	STAIR CHEEK WALL	48 lf	4/L3.02
	PARAPET STAIR CHEEK WALL	46 lf	2/L3.03
	LANDSCAPE CURB	234 lf	12/L3.01

SYMBOL	SITE FURNISHINGS DESCRIPTION	QTY	DETAIL
	BIKE RACK	5	8/L3.11
	45' FLAG POLE	1	6/L3.11
	ORNAMENTAL BOLLARD	20	7/L3.11
	LITTER/RECYCLE RECEPTACLE	4	5/L3.11
	OUTDOOR BENCH A	2	2/L3.11
	OUTDOOR BENCH B	3	3/L3.11
SYMBOL	PLANTING ACCESSORIES DESCRIPTION	QTY	DETAIL
	VEGETATED ROOF SYSTEM	200 sf	4/L3.14
SYMBOL	RAIL DESCRIPTION	QTY	DETAIL
	GUARDRAIL ON WALL	371 lf	5/L3.02
	GUARDRAIL FREESTANDING	80 lf	6/L3.02
	RAMP HANDRAIL FREESTANDING	176 lf	7/L3.02
	HANDRAIL ON CIP WALL	185 lf	8/L3.02
	HANDRAIL ON BUILDING	93 lf	9/L3.02
	HANDRAIL FREESTANDING	44 lf	10/L3.02

ADD 11
QUANTITY CHANGES TO SPLIT RAIL FENCE AND BITUMINOUS ASPHALT



REFERENCE NOTES SCHEDULE L1.22

SYMBOL	ASPHALT PAVING DESCRIPTION	DETAIL
	32-12-17 ASPHALT COURT PAVING	1/L3.12
	32-12-17B BITUMINOUS ASPHALT PAVING	3/L3.01

SYMBOL	FENCES AND GATES DESCRIPTION	DETAIL
	32-31-13B 8' BLACK CHAIN LINK FENCE	8/L3.01
	32-31-13C 10' BLACK CHAIN LINK FENCE	2/L3.12

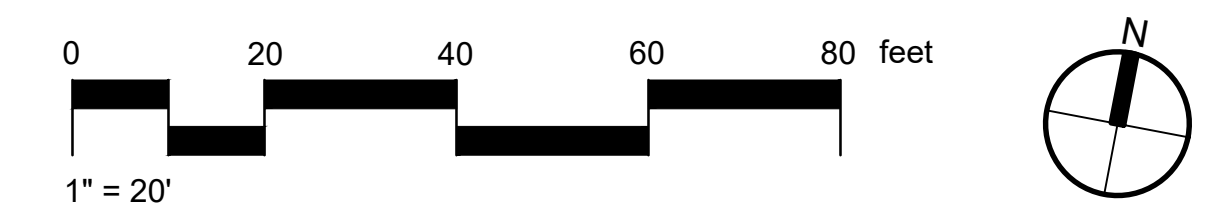
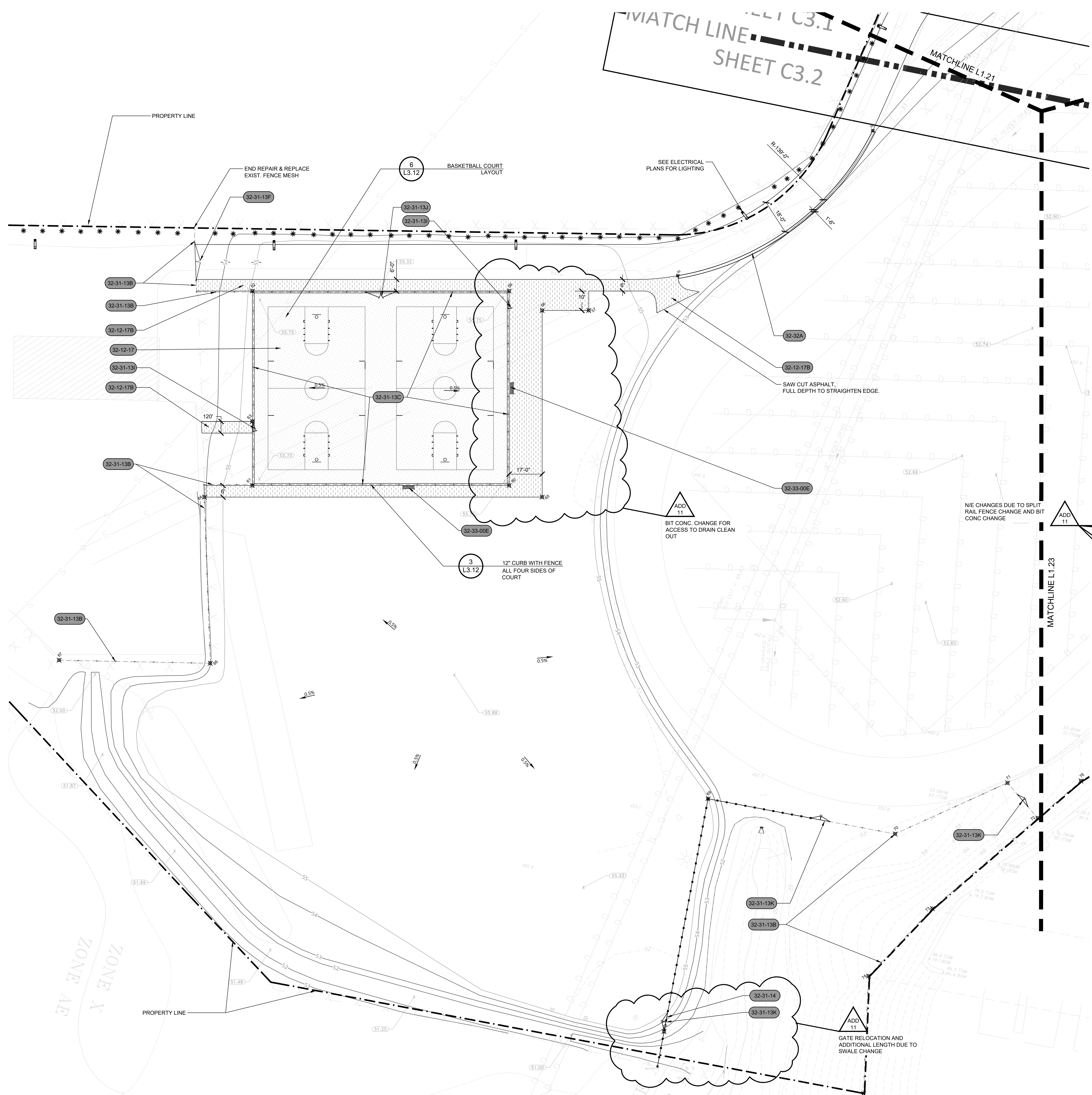
SYMBOL	FENCES AND GATES DESCRIPTION	DETAIL
	32-31-13F 8' CHAIN LINK 20' WIDE DOUBLE GATE	9/L3.01
	32-31-13G 8' CHAIN LINK 8' WIDE DOUBLE GATE	7/L3.01
	32-31-13I 10' FENCE CHAIN LINK SINGLE GATE	4/L3.12
	32-31-13J 10' FENCE CHAIN LINK DOUBLE GATE	5/L3.12
	32-31-13K 4' CHAIN LINK 10' WIDE DOUBLE GATE	10/L3.01
	32-31-14 SPLIT RAIL FENCE	5/L3.01

SYMBOL	RETAINING WALLS DESCRIPTION	DETAIL
	32-32A SMALL RETAINING WALL	2/L3.10

SYMBOL	SITE FURNISHINGS DESCRIPTION	DETAIL
	32-33-00E OUTDOOR BENCH A	2/L3.11

NORTHING/EASTING POINT SCHEDULE

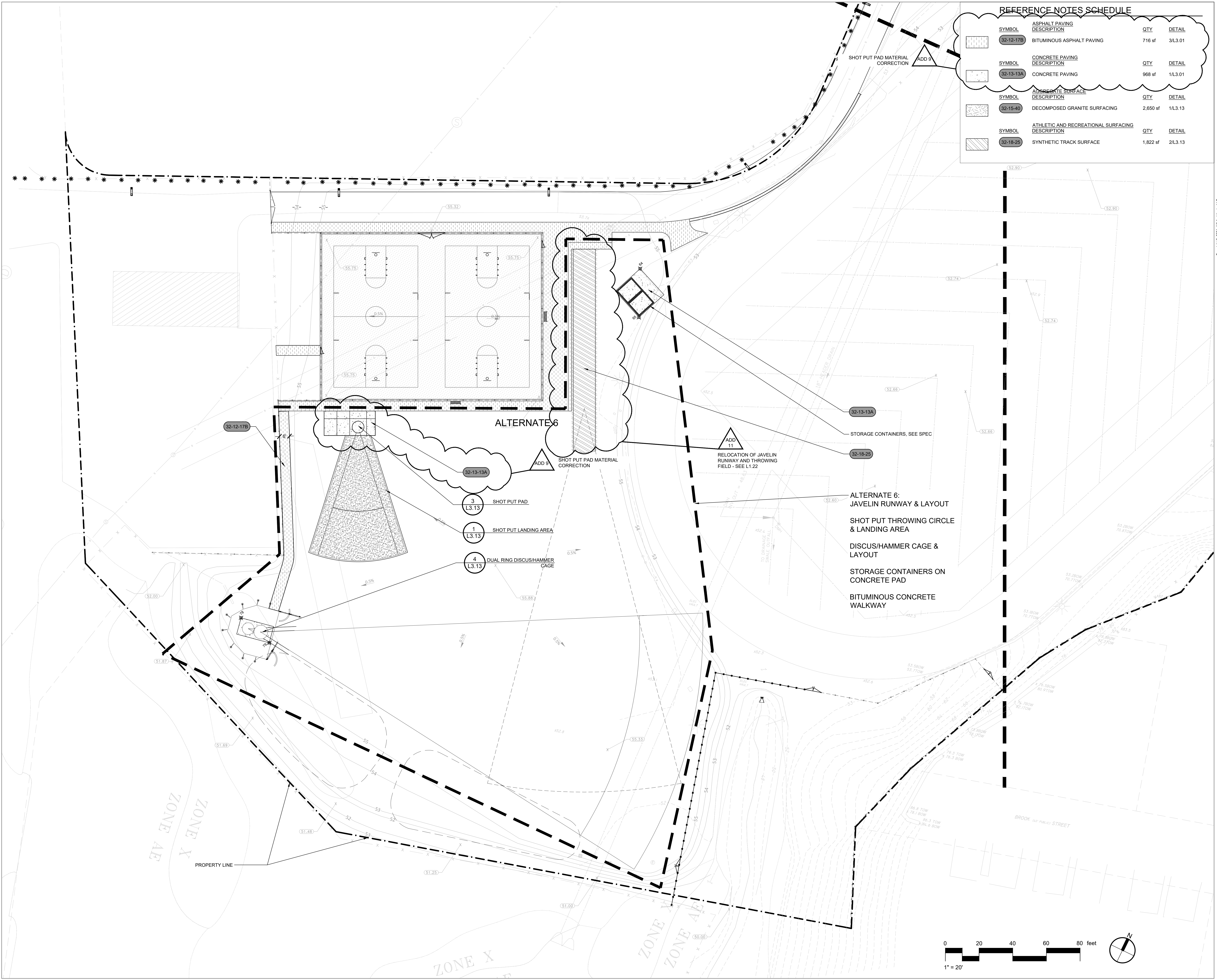
POINT	DESCRIPTION	NORTHING	EASTING
55		N 291999.31	E 354348.88
56		N 292099.56	E 354492.45
57		N 291972.64	E 354307.50
58		N 291967.86	E 354283.98
59		N 291874.29	E 354465.98
60		N 291876.12	E 354285.28
61		N 291849.76	E 354155.60
62		N 291947.81	E 354135.65
63		N 291852.10	E 354149.03
64		N 291838.98	E 354132.69
65		N 291873.63	E 354303.13
66		N 291959.09	E 354132.00
67		N 291744.73	E 354075.98
68		N 291616.33	E 354419.54
69		N 291736.36	E 354177.86
70		N 291739.84	E 354515.92
71		N 291777.13	E 354567.45
72		N 291762.47	E 354586.32
73		N 291705.94	E 354542.42
74		N 291665.32	E 354517.10
75		N 291605.53	E 354526.64





KEYNOTE LEGEND:

REFERENCE NOTES SCHEDULE			
SYMBOL	ASPHALT PAVING DESCRIPTION	QTY	DETAIL
	32-12-17B BITUMINOUS ASPHALT PAVING	716 sf	3/L3.01
SYMBOL	CONCRETE PAVING DESCRIPTION	QTY	DETAIL
	32-13-13A CONCRETE PAVING	968 sf	1/L3.01
SYMBOL	ADDITIONAL SURFACE DESCRIPTION	QTY	DETAIL
	32-15-40 DECOMPOSED GRANITE SURFACING	2,650 sf	1/L3.13
SYMBOL	ATHLETIC AND RECREATIONAL SURFACING DESCRIPTION	QTY	DETAIL
	32-18-25 SYNTHETIC TRACK SURFACE	1,822 sf	2/L3.13



ADD 11 02/13/2024

ADD 9 02/06/2024

ADD 7 01/26/2024

100% CONSTRUCTION DOCUMENTS
KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:

**HARDSCAPE PLAN
ALTERNATE 6**

DRAWN BY: J. FIGLIOZZI, E. LIMON

REVIEWED BY: S. D'AMBROSIA, J. ROBERTSHAW

SCALE: 1"=20'-0" DRAWING NUMBER:

JOB NO.: K1031

DATE: OCTOBER 13, 2023 **L1.22A**

ADD 11	02/13/2024
ADD 9	02/06/2024
ADD 7	01/26/2024

100% CONSTRUCTION DOCUMENTS

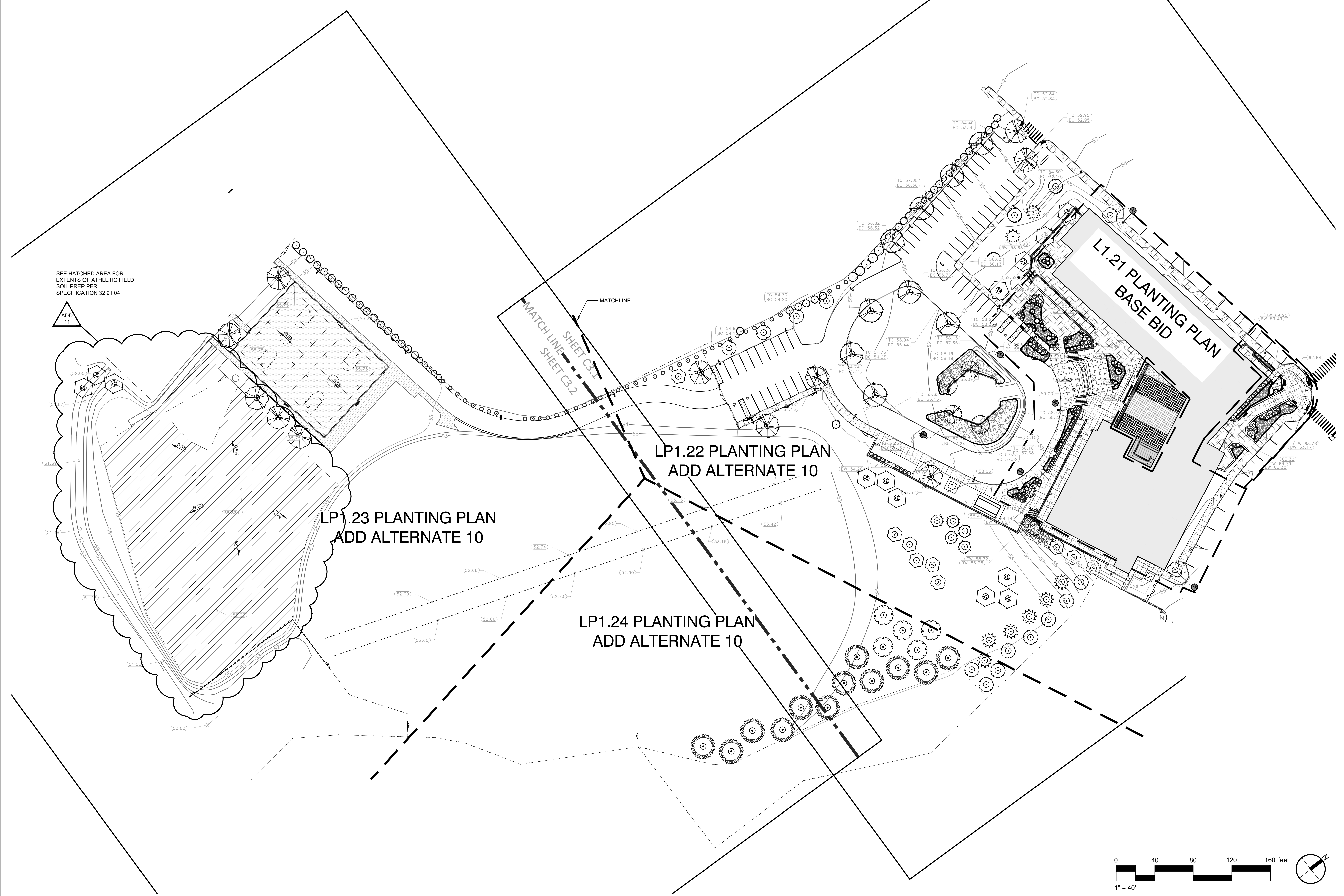
KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:

OVERALL PLANTING PLAN

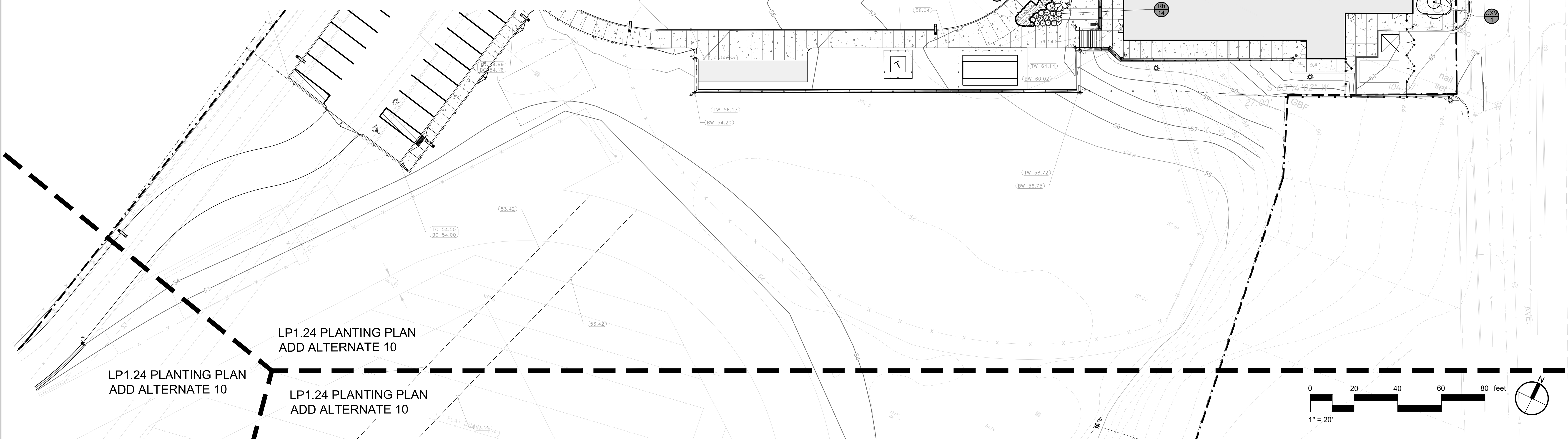
DRAWN BY: J. FIGLIOZZI, E. LIMON
REVIEWED BY: S. D'AMBROSIA, J. ROBERTSHAW
SCALE: 1"=40'-0" DRAWING NUMBER:
JOB NO.: K1031
DATE: OCTOBER 13, 2023 **LP1.01**



PLANT SCHEDULE LP1.21

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
TREES						
	CXV	6	Cornus x KN36-8 / Venus® Dogwood	B & B		7'-8" H
	GPs	2	Ginkgo biloba 'Princeton Sentry' / Princeton Sentry Maidenhair Tree	B & B		2.5'-3" Cal.
	UP	1	Ulmus americana 'Princeton' / Princeton American Elm	B & B		2.5'-3" Cal.
SHRUBS						
	Ai	3	Aronia melanocarpa 'UCONNAM165' / Low Scape Mound® Black Chokeberry	5 gal		
	Ce	26	Cephalotaxus harringtonia 'Fastigata' / Upright Plum Yew	5 gal		2'-3" H
	Cp	3	Comptonia peregrina / Sweet Fern	5 gal		
	Cb	5	Cornus alba 'Balthaz' / Ivory Halo® Tatarian Dogwood	3 gal		
	Cs	12	Cornus sericea 'Artic Fire' / Artic Fire Dogwood	#3		
	Hs	22	Hydrangea quercifolia 'Snowflake' / Snowflake Oakleaf Hydrangea	#5		
	Ig	17	Ilex glabra 'Shamrock' / Shamrock Inkberry Holly	#5		
	Iw	5	Ilex verticillata 'Red Sprite' / Red Sprite Winterberry	#5		
	La	11	Leucothoe axillaris / Coastal Leucothoe	5 gal		
	Pi	2	Picea abies 'Pendula' / Weeping Norway Spruce	B & B		
	Rp	14	Rhododendron yakushimanum 'Princess' / Yaku Princess Rhododendron	#7		
	Rh	17	Rhus aromatica 'Gro-Low' / Gro-Low Fragrant Sumac	#3		
PERENNIALS/GRASSES						
	Ah	27	Amsonia hubrichtii / Arkansas Bluestar	#2		
PERENNIALS/GRASSES						
	Ch	17	Chelone lyonii 'Amittip02' / Tiny Tortuga Pink Turtlehead	#1		48" o.c.
	Dg	59	Deschampsia cespitosa 'Goldtau' / Gold Dew Tufted Hair Grass	#1		42" o.c.
	Er	32	Echinacea purpurea 'Ruby Star' / Ruby Star Coneflower	#2		60" o.c.
	Go	13	Galium odoratum / Sweet Woodruff	#1		54" o.c.
	Gp	37	Gaultheria procumbens / Wintergreen	#2		24" o.c.
	Pa	13	Packera aurea / Golden Groundsel	#1		54" o.c.
	Pm	32	Pyronanthemum muticum / Blunt Mountainmint	#1		60" o.c.
	Rg	73	Rudbeckia fulgida sultivansi 'Goldsturm' / Goldsturm Coneflower	#1		42" o.c.
	Sn	43	Salvia nemorosa 'East Friesland' / East Friesland Meadow Sage	#1		48" o.c.
	Ss	49	Schizachyrium scoparium 'Standing Ovation' / Standing Ovation Little Bluestem	#1		48" o.c.
	Sa	73	Sesleria autumnalis / Autumn Moor Grass	#1		36" o.c.
	Sh	41	Sporobolus heterolepis / Prairie Dropseed	#2		38" o.c.
	So	12	Symphoricarum oblongifolium 'October Skies' / October Skies Fall Aster	#2		72" o.c.
	Tr	24	Tiarella cordifolia 'Running Tapestry' / Running Tapestry Foamflower	#1		40" o.c.
	Za	54	Zizia aurea / Golden Alexander	#1		42" o.c.
SEED MIXES						
	Na	3,183 sf	NEW ENGLAND WETLAND SEED MIX	seed		

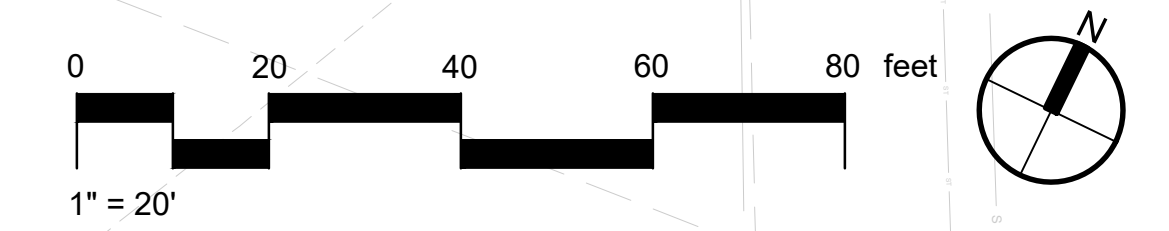
ADD 11
RAIN GARDEN AREAS (WETLAND SEED MIX) ADDED TO BASE BID PLANTING AND REMOVED FROM ADD ALT 10



LP1.24 PLANTING PLAN
ADD ALTERNATE 10

LP1.24 PLANTING PLAN
ADD ALTERNATE 10

LP1.24 PLANTING PLAN
ADD ALTERNATE 10



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

KEYNOTE LEGEND:

ADD 11	02/13/2024
ADD 9	02/06/2024
ADD 7	01/26/2024

100% CONSTRUCTION DOCUMENTS
KEY PLAN NORTH ARROW

KEYPLAN

DRAWING NAME:

PLANTING PLAN
BASE BID

DRAWN BY: J. FIGLIOLZI, E. LIMON
REVIEWED BY: S. D'AMBROSIA, J. ROBERTSHAW
SCALE: 1"=20'-0" DRAWING NUMBER:
JOB NO.: K1031
DATE: OCTOBER 13, 2023
LP1.21

PLANT SCHEDULE LP1.22

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
TREES						
	AC	7	Abies concolor / White Fir	8.8.8		6'-7" H
	AD	6	Acer rubrum 'October Glory' / October Glory Red Maple	8.8.8	2.5'-3" Cal.	
	AFA	4	Acer x freemantli 'Armstrong' / Armstrong Freeman Maple	8.8.8	2.5'-3" Cal.	
	BNC	4	Betula nigra 'Cully Improved' TM / Heritage Improved River Birch	Multi-stem 8.8.8		10'-12"
	BW	10	Betula populifolia 'White Spirit' / Whitespire Gray Birch	Multi-stem 8.8.8		8'-10"
	CC	4	Cercis canadensis 'Forest Pansy' / Forest Pansy Eastern Redbud	8.8.8	2'-2.5" Cal.	
	CNG	1	Chamaecyparis nootkatensis 'Glaucia Pendula' / Blue Weeping Nootka Cypress	8.8.8		7'-8" H
	CV	9	Crataegus virens 'Winter King' / Winter King Hawthorn	8.8.8	2'-2.5" Cal.	
	JVI	12	Juniperus virginiana 'Sylwester' / Sylwester Eastern Redcedar	8.8.8		5'-6" H
	PG	5	Pinus parviflora 'Glauca' / Japanese White Pine	8.8.8		6'-7" H
	TE	5	Thuja occidentalis 'Elegantissima' / Elegantissima Arborvitae	8.8.8		7'-8" H
	TH	18	Thuja occidentalis 'Heiz Wintergreen' / Heiz Wintergreen Arborvitae	8.8.8		6'-7" H
	TS	35	Thuja occidentalis 'Smaragd' / Emerald Green Arborvitae	8.8.8		5'-6" H
	TP	5	Thuja plicata 'Green Giant' / Green Giant Western Red Cedar	8.8.8		5'-6" H
	UP	9	Ulmus americana 'Priston' / Priston American Elm	8.8.8	2.5'-3" Cal.	
SHRUBS						
	Hv	3	Hamelis vernalis / Ozark Witchhazel	8.8.8		4'-5" H
	Jha	25	Juniperus horizontalis 'Andorra' / Andorra Juniper	8.8.8		4'-5" H
SEED MIXES						
		1,180	NEW ENGLAND WETLAND SEED MIX			

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SIZE
	Hv	3	Hamelis vernalis / Ozark Witchhazel	8.8.8	4'-5" H
	Jha	25	Juniperus horizontalis 'Andorra' / Andorra Juniper	8.8.8	4'-5" H

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SPACING
		1,180	NEW ENGLAND WETLAND SEED MIX		

RAIN GARDEN AREAS (WETLAND SEED MIX) ADDED TO BASE BID PLANTING AND REMOVED FROM ADD 10

ADD 11

ELECTRIC TRANSFORMER ON CONCRETE W/ BOLLARDS

LP1.24 PLANTING PLAN ALTERNATE 10

LP1.24 PLANTING PLAN ALTERNATE 10

SEE PLANTING PLAN LP1.21

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KEYNOTE LEGEND:

ADD 11 02/13/2024

ADD 9 02/06/2024

ADD 7 01/26/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW

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DRAWING NAME:

PLANTING PLAN ALTERNATE 10

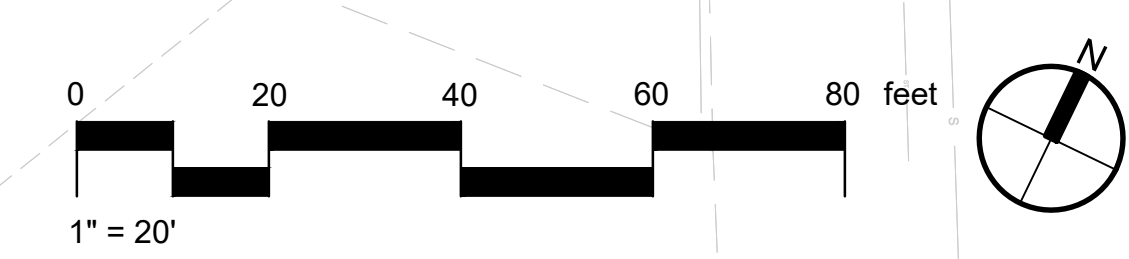
DRAWN BY: J. FIGLIOLZI, E. LIMON

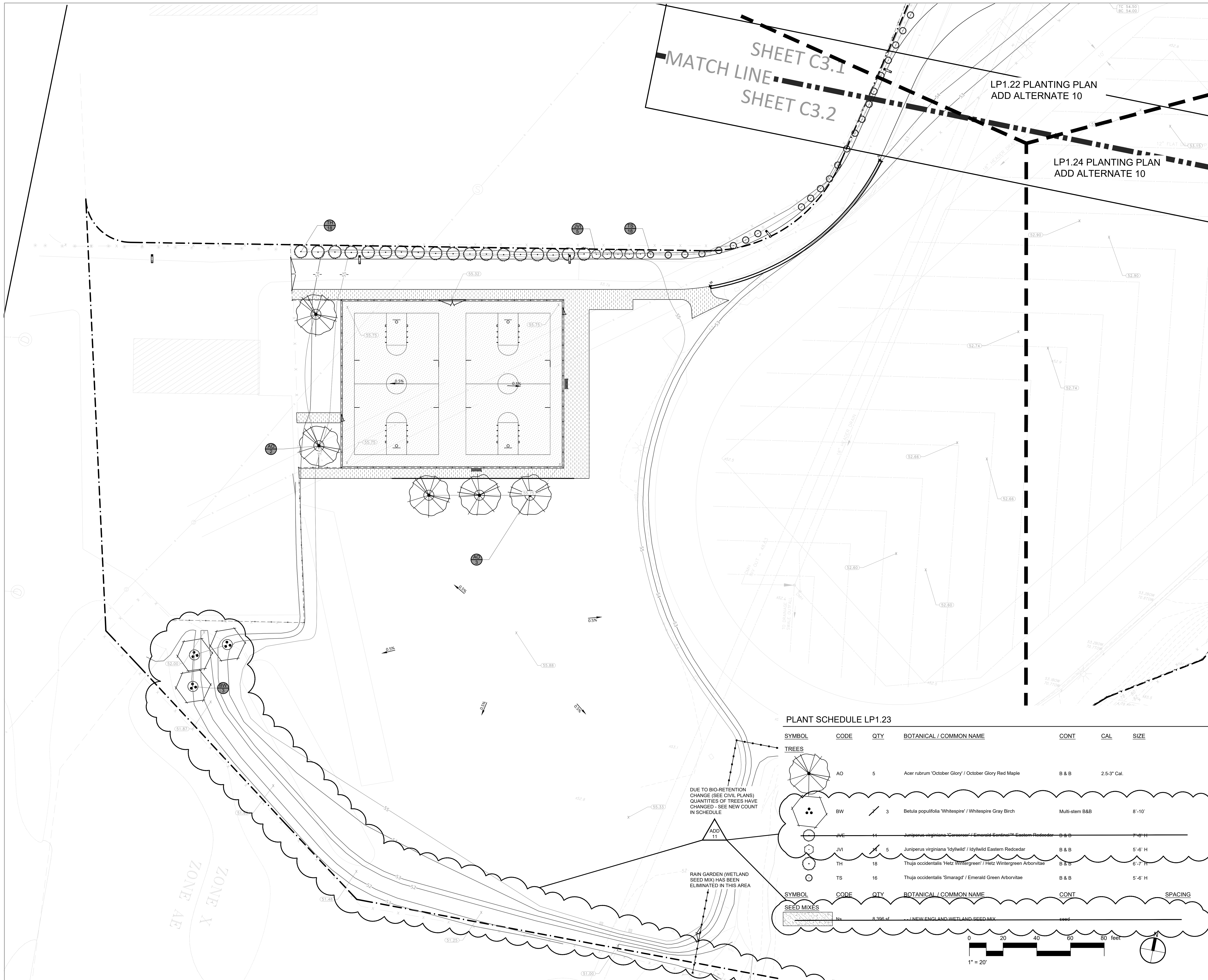
REVIEWED BY: S. D'AMBROSIA, J. ROBERTSHAW

SCALE: 1"=20'-0" DRAWING NUMBER:

JOB NO.: K1031

DATE: OCTOBER 13, 2023 LP1.22

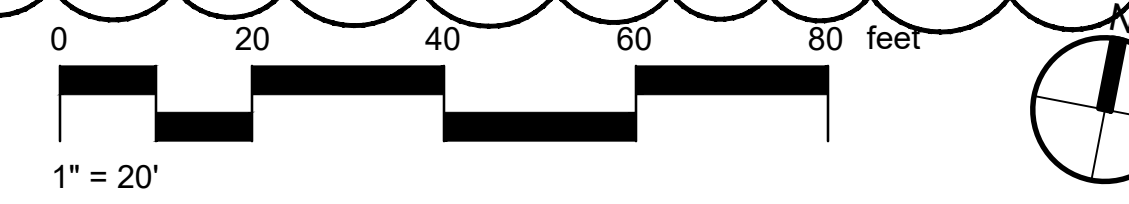


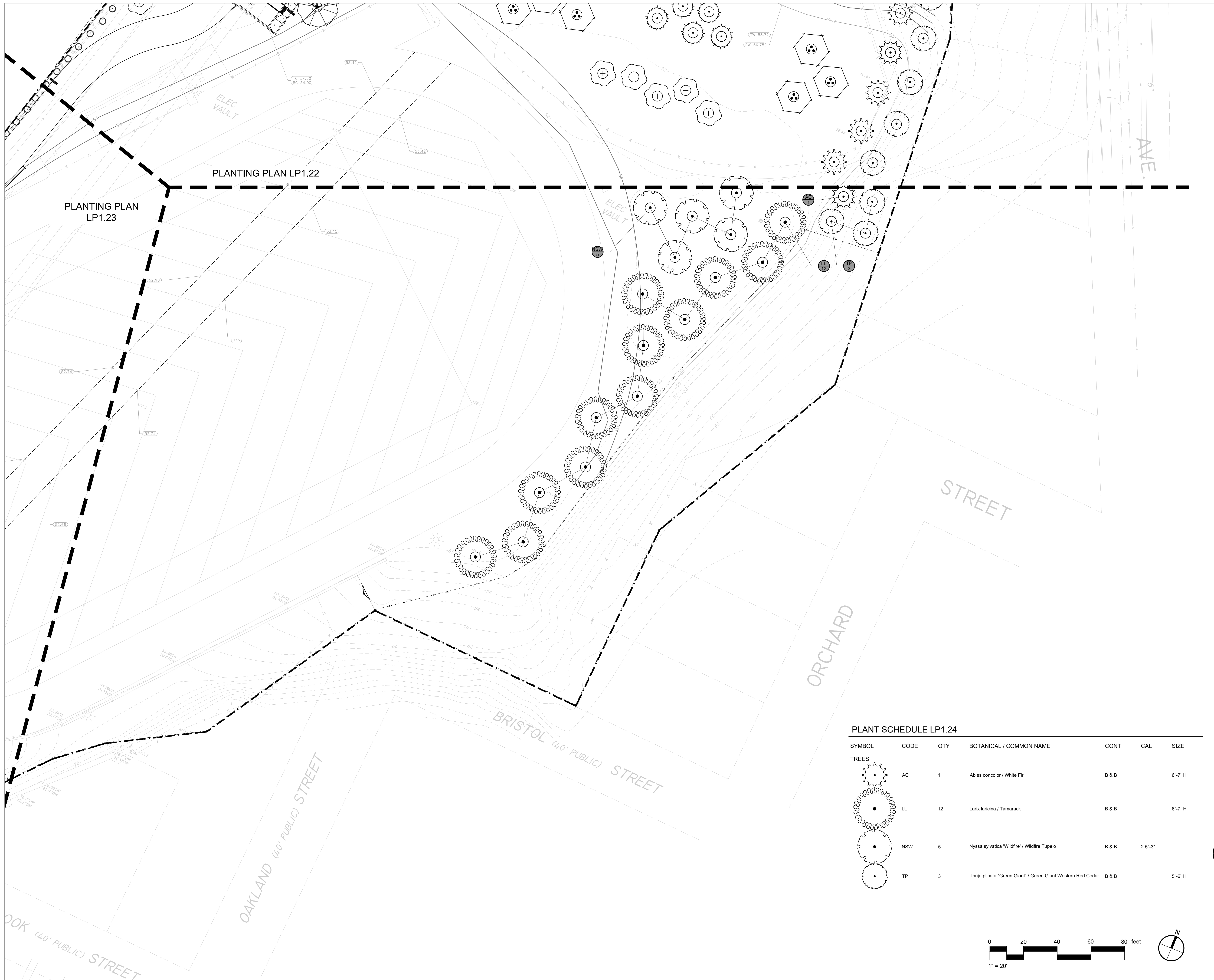


PLANT SCHEDULE LP1.23

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
TREES						
	AO	5	Acer rubrum 'October Glory' / October Glory Red Maple	B & B	2.5-3" Cal.	
	BW	3	Betula populifolia 'Whitespire' / Whitespire Gray Birch	Multi-stem B&B		8'-10"
	JVE	11	Juniperus virginiana 'Conesora' / Emerald Sentinel™ Eastern Redcedar	B & B		7'-8" H
	JVI	5	Juniperus virginiana 'Idyllwild' / Idyllwild Eastern Redcedar	B & B		5'-6" H
	TH	18	Thuja occidentalis 'Hetz Wintergreen' / Hetz Wintergreen Arborvitae	B & B		6'-7" H
	TS	16	Thuja occidentalis 'Smaragd' / Emerald Green Arborvitae	B & B		5'-6" H
SEED MIXES						
	Ne	8,396 sf	/ NEW ENGLAND WETLAND SEED MIX	seed		

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SPACING
	Ne	8,396 sf	/ NEW ENGLAND WETLAND SEED MIX	seed	





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

KEYNOTE LEGEND:

ADD 11	02/13/2024
ADD 9	02/06/2024
ADD 7	01/26/2024

100% CONSTRUCTION DOCUMENTS
KEY PLAN NORTH ARROW

KEYPLAN

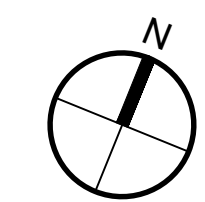
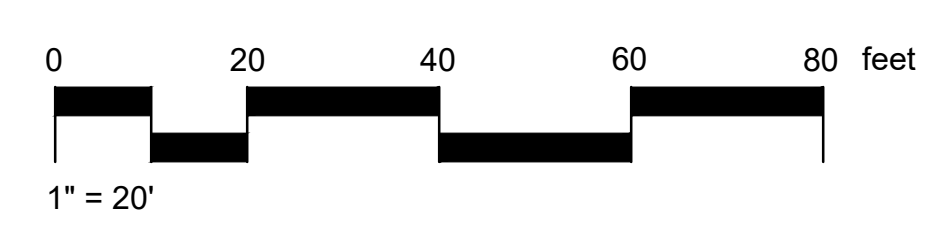
TITLE HAS BEEN CHANGED TO ALTERNATE 10 FROM BASE BID

DRAWING NAME:
PLANTING PLAN ALTERNATE 10

DRAWN BY: J. FIGLIOLIZZI, E. LIMON
REVIEWED BY: S. D'AMBROSIA, J. ROBERTSHAW
SCALE: 1"=20'-0" DRAWING NUMBER:
JOB NO.: K1031
DATE: OCTOBER 13, 2023 **LP1.24**

PLANT SCHEDULE LP1.24

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
TREES						
	AC	1	Abies concolor / White Fir	B & B		6'-7" H
	LL	12	Larix laricina / Tamarack	B & B		6'-7" H
	NSW	5	Nyssa sylvatica 'Wildfire' / Wildfire Tupelo	B & B	2.5'-3"	
	TP	3	Thuja plicata 'Green Giant' / Green Giant Western Red Cedar	B & B		5'-6" H



MASTER KEYNOTE LEGEND

Table with 3 columns: Keynote Number, Description, and Reference. Includes items like CONCRETE, WOOD BLOCKING, STEEL COLUMN, and various finishes.

MASTER KEYNOTE LEGEND

Table with 3 columns: Keynote Number, Description, and Reference. Includes items like REMOVABLE ACCESS PANEL, WOOD BLOCKING, ALUMINUM PANEL, and various hardware.

MASTER KEYNOTE LEGEND

Table with 3 columns: Keynote Number, Description, and Reference. Includes items like ACCESS PANEL, WOOD BLOCKING, ALUMINUM WINDOW, and various door types.

MASTER KEYNOTE LEGEND

Table with 3 columns: Keynote Number, Description, and Reference. Includes items like TOILET COMPARTMENT DOOR, URINAL SCREEN, CURTAIN TRACK AND CURTAIN, and various lighting fixtures.



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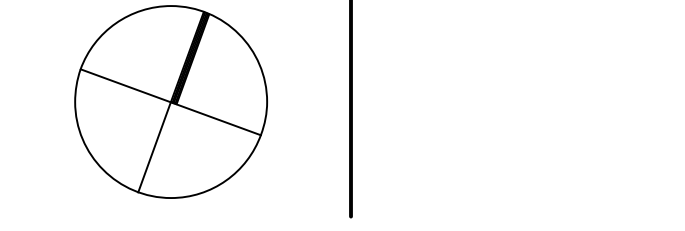


CENTRAL FALLS HIGH SCHOOL 10 HINGINSON AVE., CENTRAL FALLS, RI

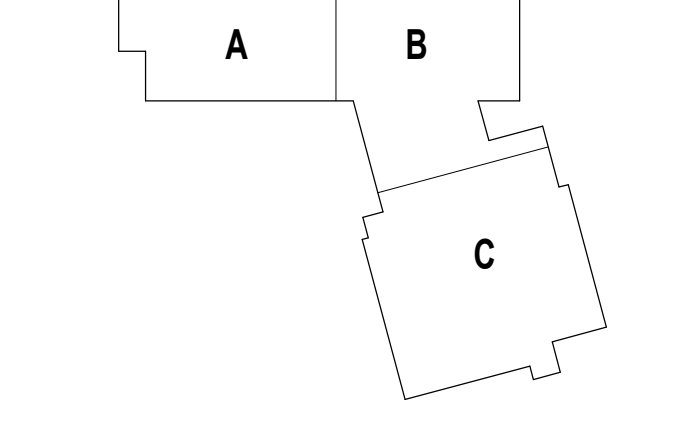
KEYNOTE LEGEND:

Table with 3 columns: Keynote Number, Description, and Reference. Includes items like ADD-11, ADD-9, ADD-8, ADD-4, and various construction details.

100% CONSTRUCTION DOCUMENTS



KEY PLAN



DRAWING NAME:

MASTER KEYNOTE LIST

Table with 3 columns: DRAWN BY, REVIEWED BY, SCALE, JOB NO., DATE, and DRAWING NUMBER. Includes values like CHR / BFC, CHR / KK, A0.02, and 10/16/2024.



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KEYNOTE LEGEND:

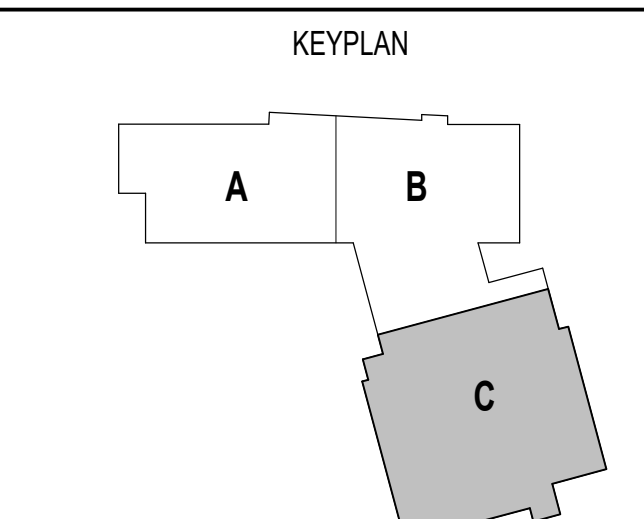
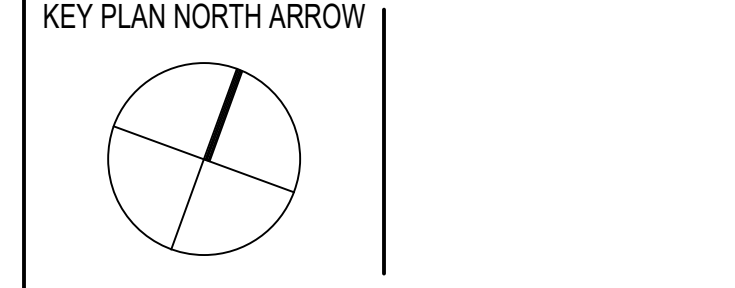
- 03 30 00 03 CONCRETE SLAB ON DECK - SEE STRUCTURAL
- 08 20 00 07 HARDWOOD BELL - TRANSPARENT FINISH
- 08 11 13 11 STEEL FRAME - SEE SCHEDULE FOR TYPES
- 08 14 16 01 SOLID CORE FLUSH WOOD DOOR - SEE DOOR SCHEDULE
- 08 31 00 12 ACCESS PANEL - FIRE RATED
- 08 43 13 01 ALUMINUM STOREFRONT FRAME
- 09 21 16 21 GYPSUM SHAFTWALL LINER PANEL - 1 INCH
- 09 21 16 32 GYPSUM BOARD - 5/8 INCH TYPE X - 2 LAYERS
- 09 22 16 01 METAL STUD - 1.58 INCH - 16 INCHES O.C. MAX
- 09 22 16 03 METAL STUD - 3.58 INCH - 16 INCHES O.C. MAX
- 09 29 00 02 5/8 INCH GYPSUM BOARD - LEVEL 4 FINISH - 2 LAYERS
- 09 29 00 21 5/8 INCH GYPSUM BOARD - LEVEL 4 FINISH - SAG RESISTANT
- 09 29 04 41 CONTROL JOINT - 1/4 INCH
- 09 29 00 43 CORNER BEAD
- 09 29 00 08 GYPSUM BOARD SYSTEM - LEVEL 5 FINISH - REFER TO FLOOR PLANS AND WALL TYPES FOR COMPONENTS
- 09 29 00 09 GYPSUM BOARD SYSTEM - LEVEL 4 FINISH - REFER TO FLOOR PLANS AND WALL TYPES FOR COMPONENTS
- 05 51 00 06 ACT TYPE-6
- 06 65 13 01 RUBBER BASE - 4 INCH
- 06 65 19 99 RIF - REFERENCE SCHEDULE AND SAMPLE PATTERNS FOR TYPE
- 08 84 00 11 ACOUSTICAL PANEL - WALL MOUNTED - FABRIC WRAPPED - TYPE 2
- 08 84 00 12 ACOUSTICAL PANEL - WALL MOUNTED - FABRIC WRAPPED - TYPE 2
- 08 84 00 32 ACOUSTICAL PANEL - WALL MOUNTED - PYRAMID TYPE 2
- 09 91 00 01 PANELED - SEE SCHEDULE
- 10 11 16 01 DRY MARKER BOARD
- 10 11 16 11 TACK BOARD
- 10 44 00 01 FIRE EXTINGUISHER CABINET - FULLY RECESSED
- 10 44 00 03 FIRE EXTINGUISHER WALL MOUNTED BRACKET
- 10 44 00 11 FIRE EXTINGUISHER
- 11 61 00 05 TORN LADDER

ACOUSTIC PANEL LEGEND			
COLOR 1	COLOR 2	COLOR 3	COLOR 4
COLOR 5	COLOR 6		

- GENERAL NOTES:**
1. NOT ALL POWER AND DATA OUTLET/ SWITCHING LOCATIONS SHOWN. COORDINATE WITH ELECTRICAL AND TECHNOLOGY DRAWINGS FOR ALL LOCATIONS.
 2. REFER TO DETAILS ON A10.51 FOR FIRE EXTINGUISHER DETAILS AND MOUNTING HEIGHTS.
 3. REFERENCE TOILET ACCESSORIES LEGEND AND SCHEDULE ON DRAWING A8.31 FOR ADDITIONAL INFORMATION.
 4. WHERE EXPOSED, ALL STRUCTURAL MEMBERS & MEPP SHALL RECEIVE PAINTED FINISH UN.O. HORIZONTAL PAINT TRANSITION LINE TO BE COORDINATED ON WALLS OF SPACES WITH EXPOSED DECKING.

ADD-11 ADDENDUM #11 02.13.2024

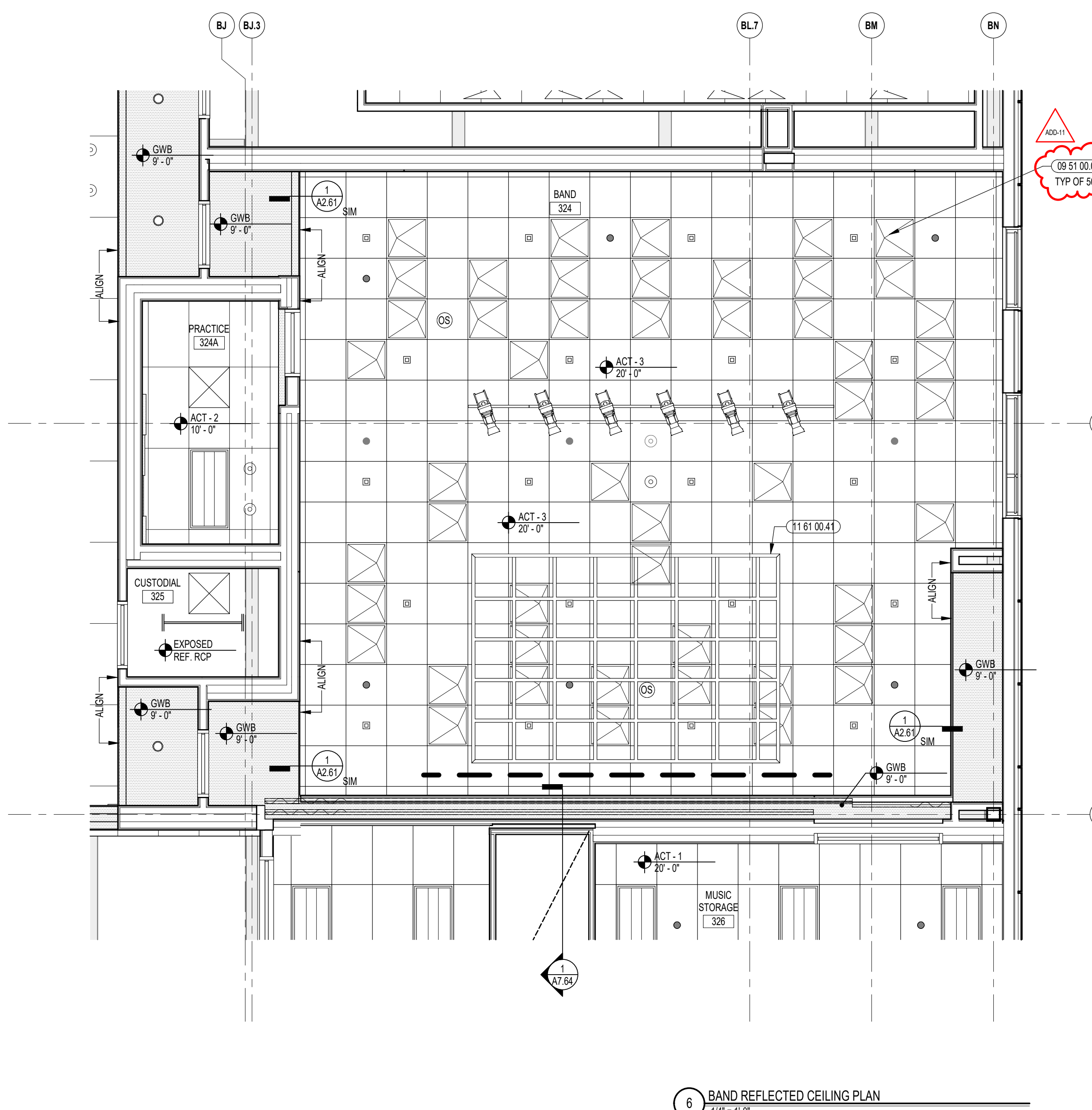
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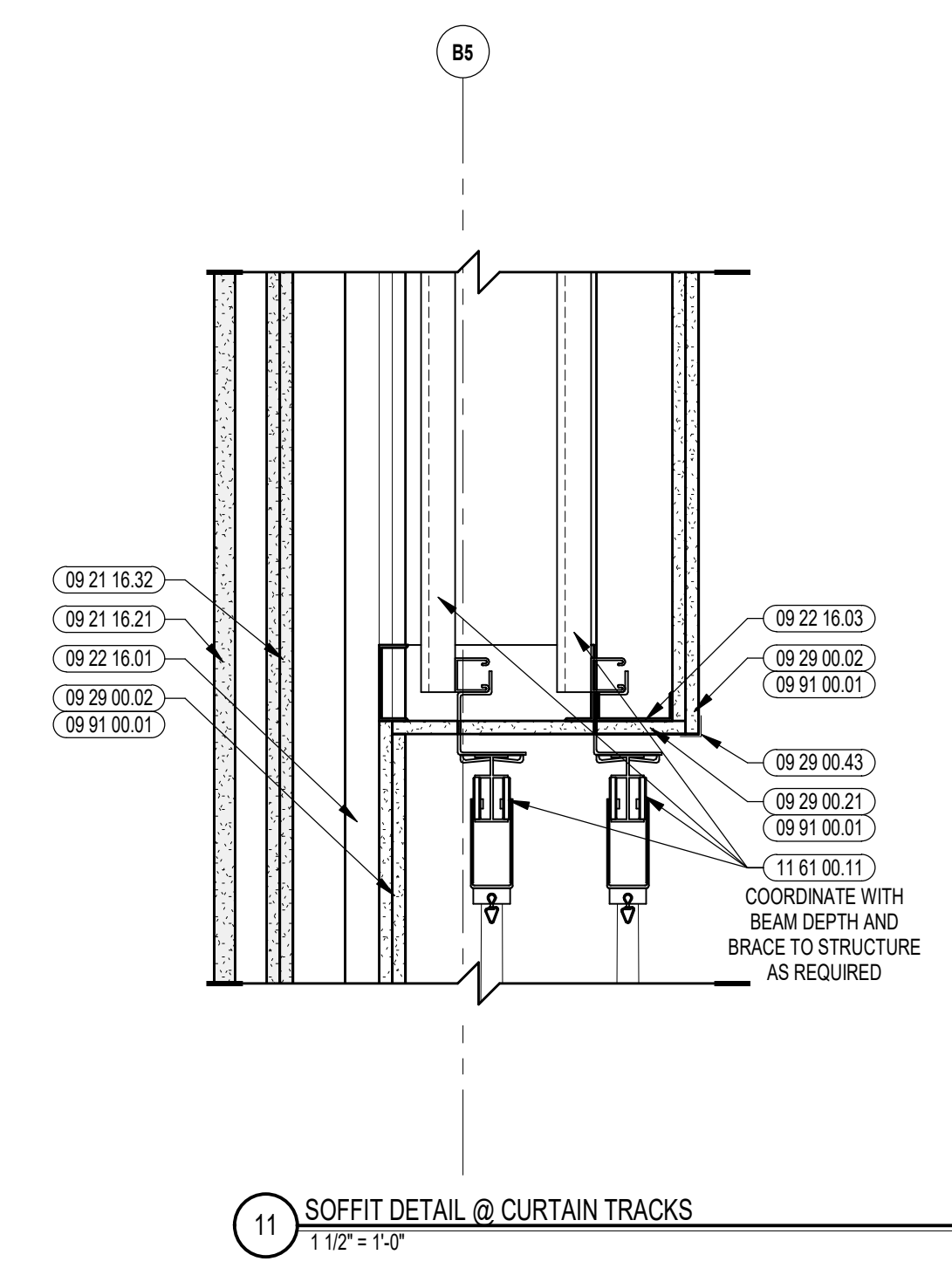
DRAWING NAME:

BAND CLASSROOMS ENLARGED PLAN AND INTERIOR ELEVATIONS

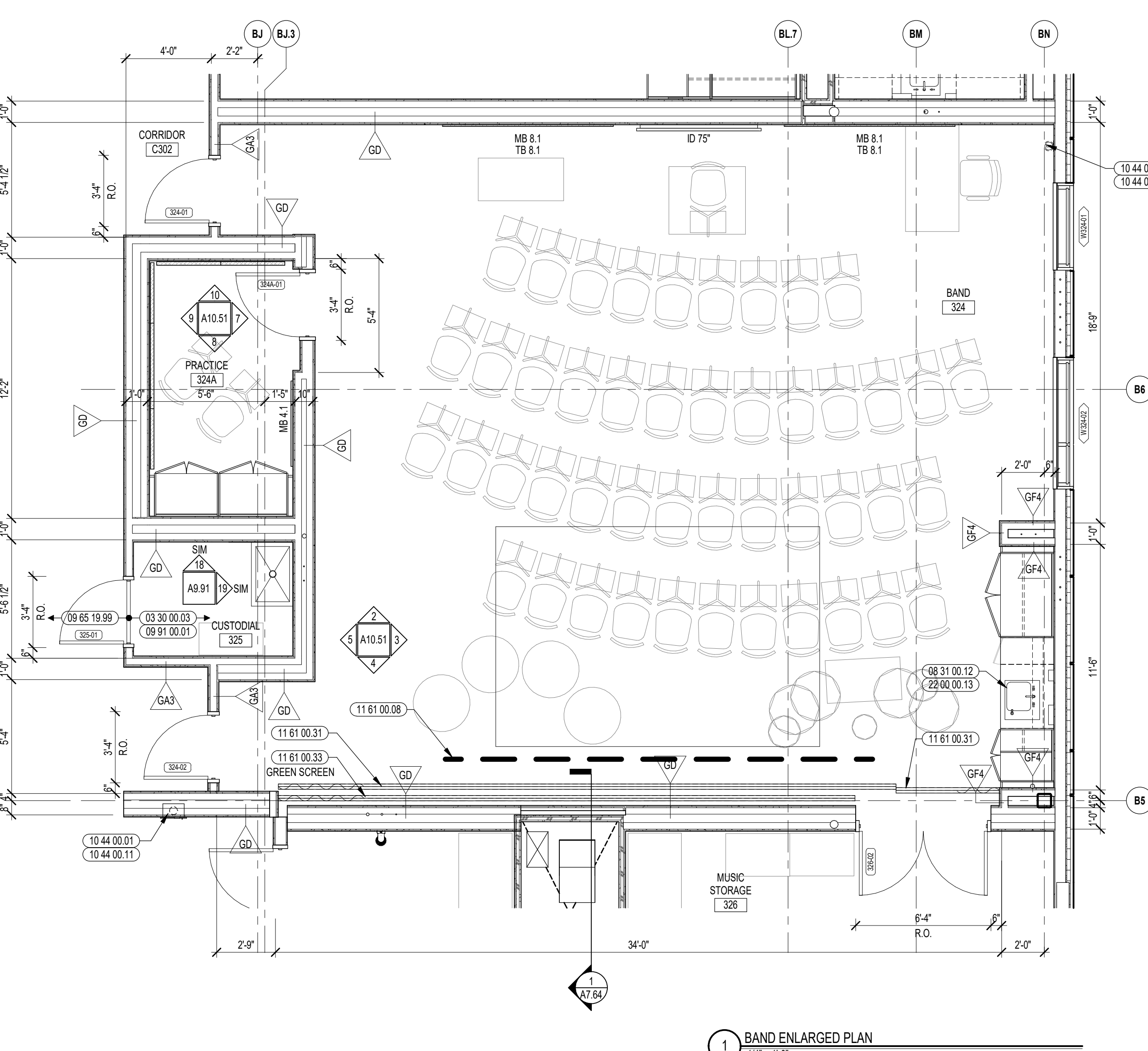
DRAWN BY: MS / CHR / MCT
 REVIEWED BY: CHR / KK
 SCALE: AS INDICATED | DRAWING NUMBER: A10.51
 JOB NO.: 2202.02
 DATE: OCTOBER 13, 2023



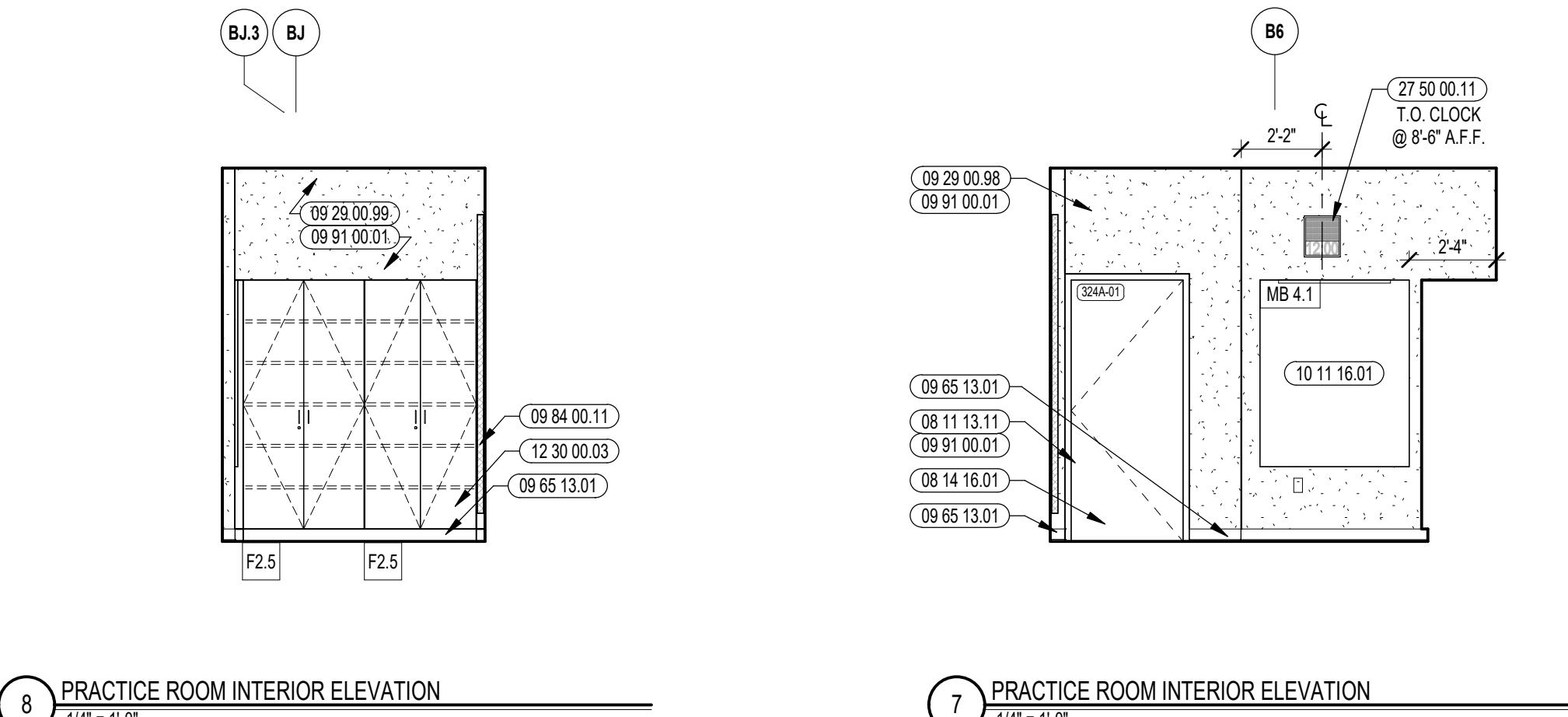
6 BAND REFLECTED CEILING PLAN 1/4" = 1'-0"



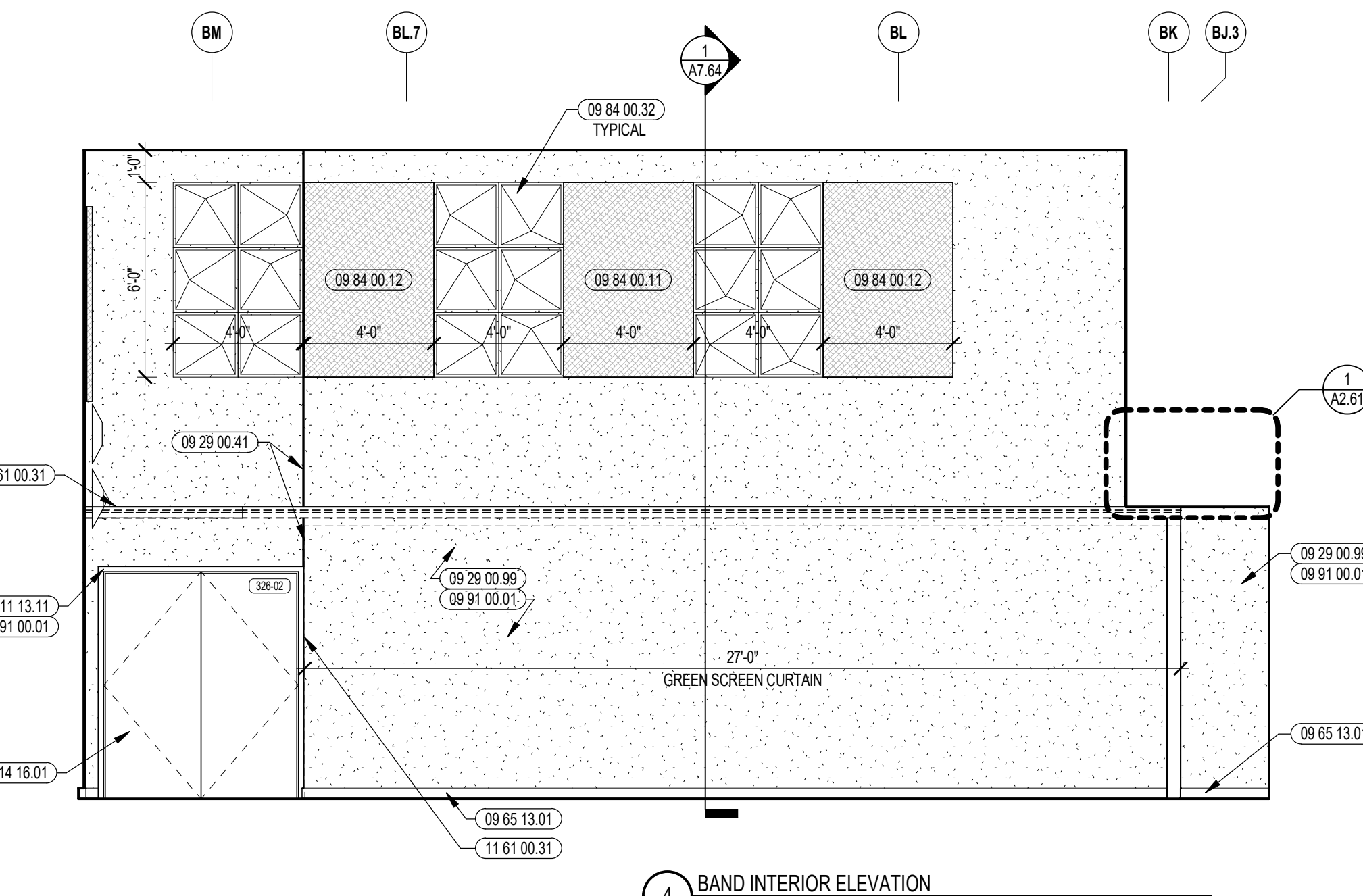
11 SOFFIT DETAIL @ CURTAIN TRACKS 1/2" = 1'-0"



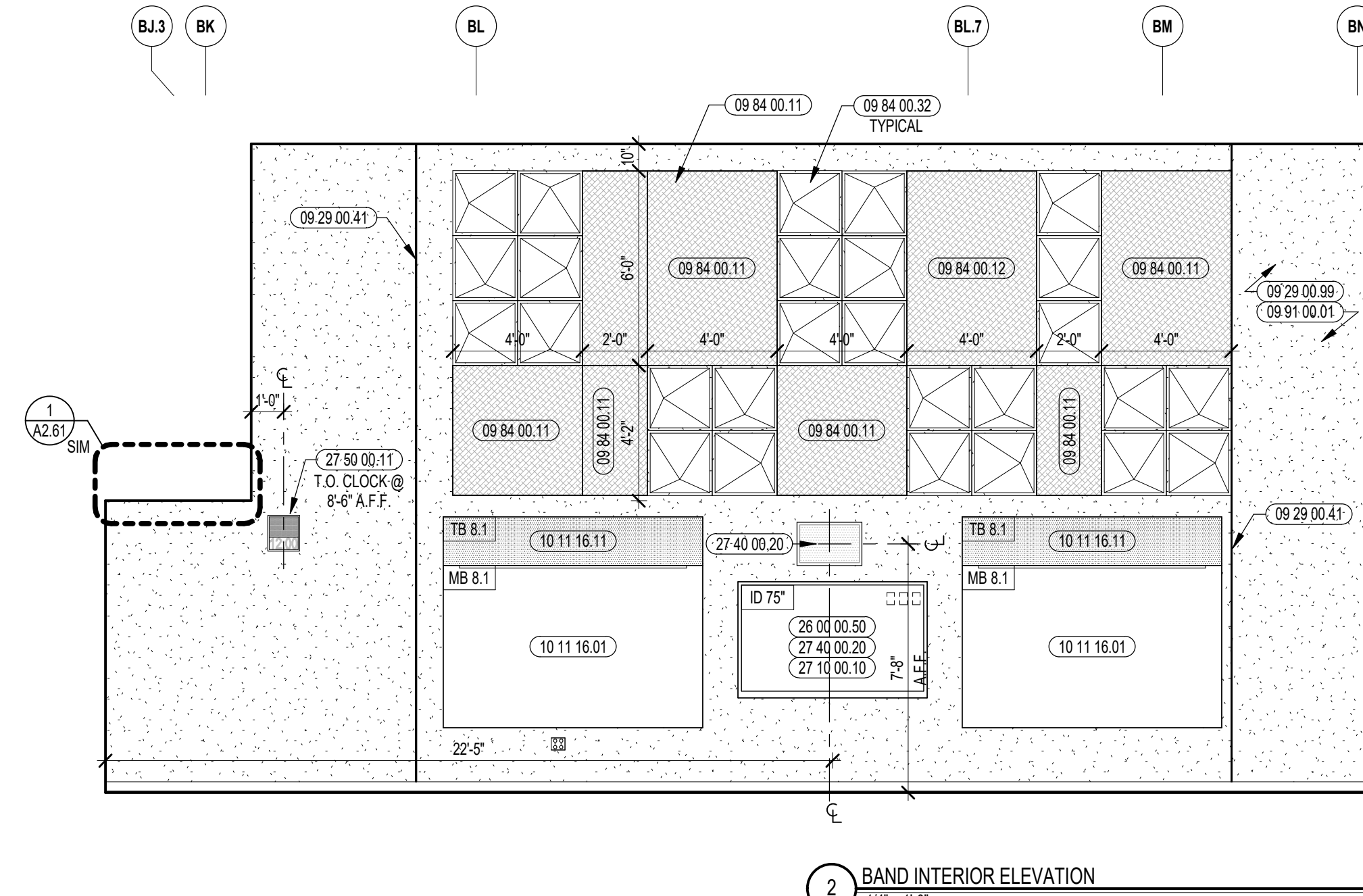
1 BAND ENLARGED PLAN 1/4" = 1'-0"



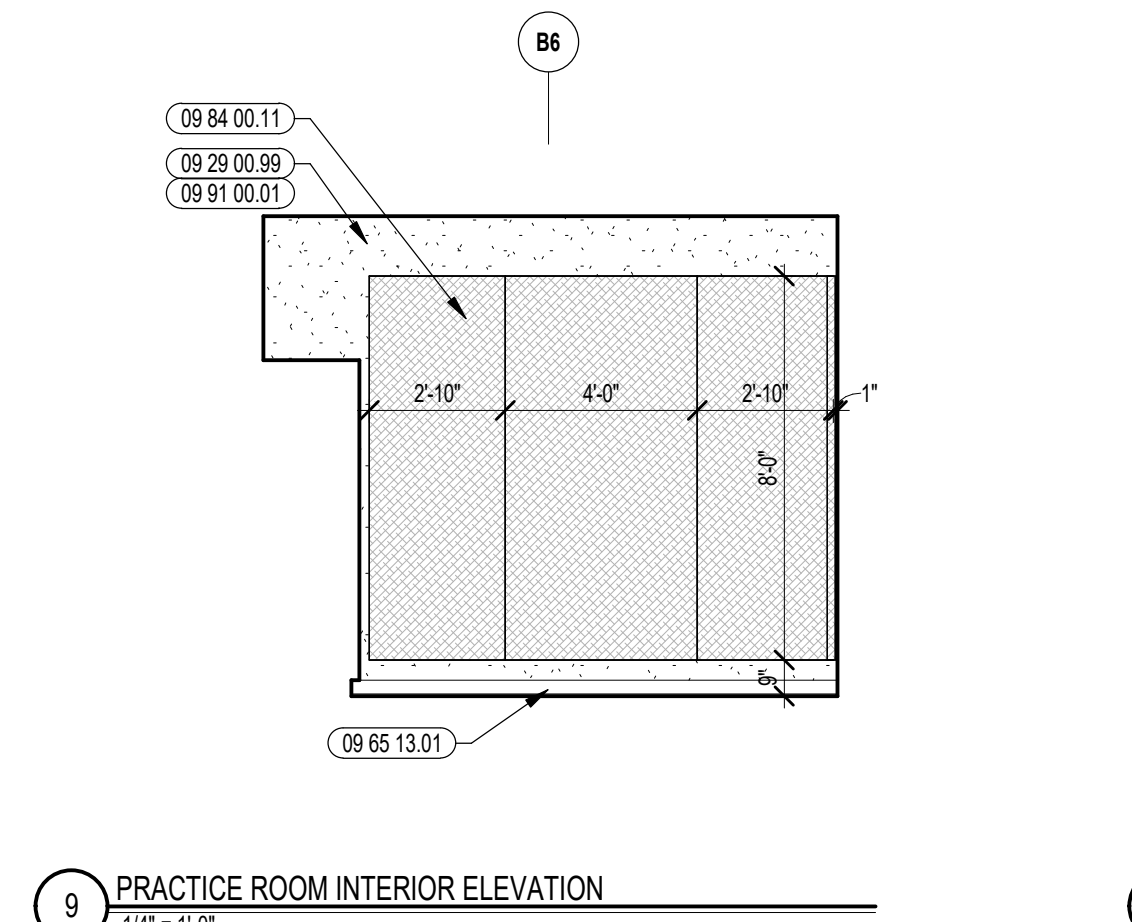
7 PRACTICE ROOM INTERIOR ELEVATION 1/4" = 1'-0"



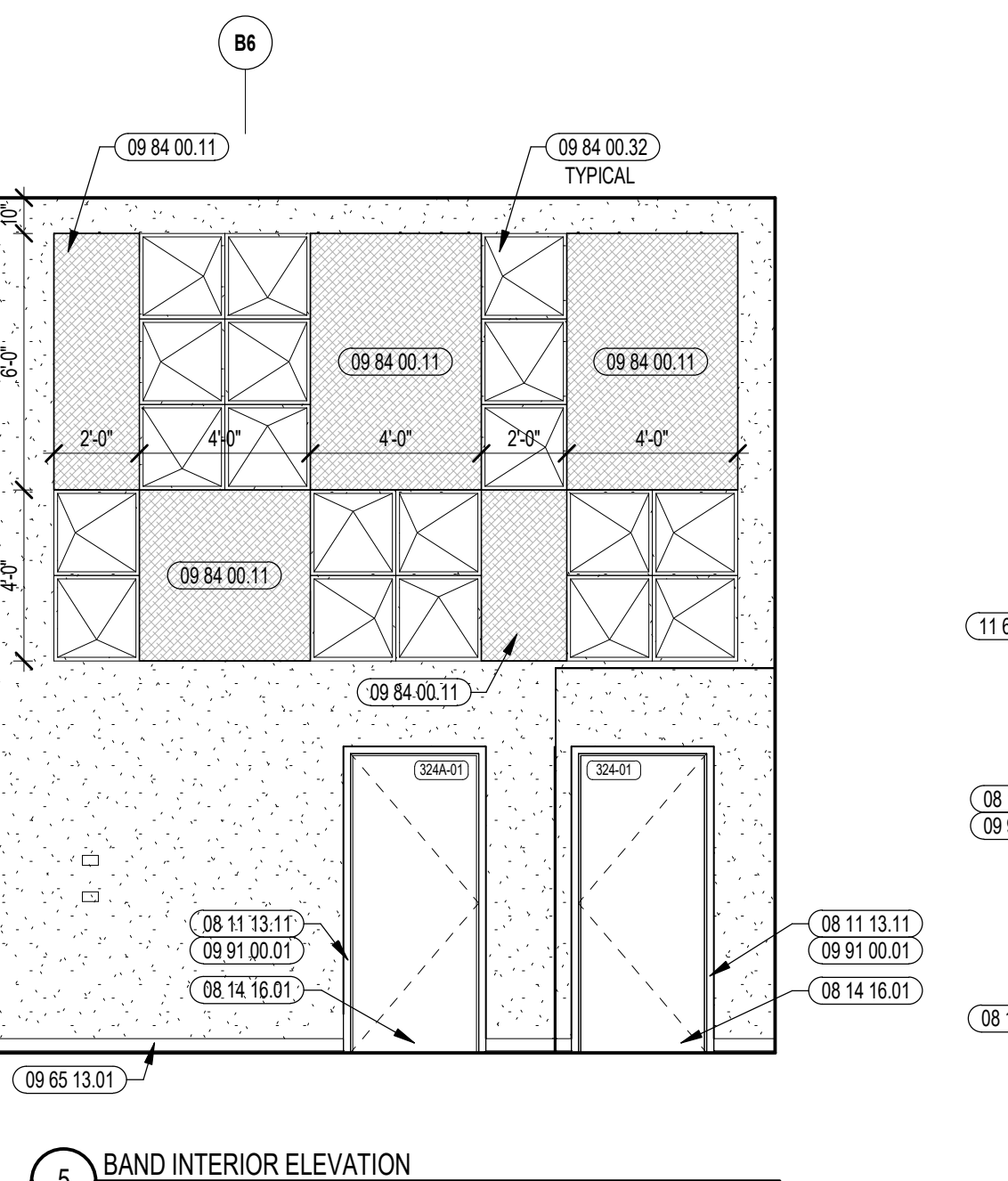
4 BAND INTERIOR ELEVATION 1/4" = 1'-0"



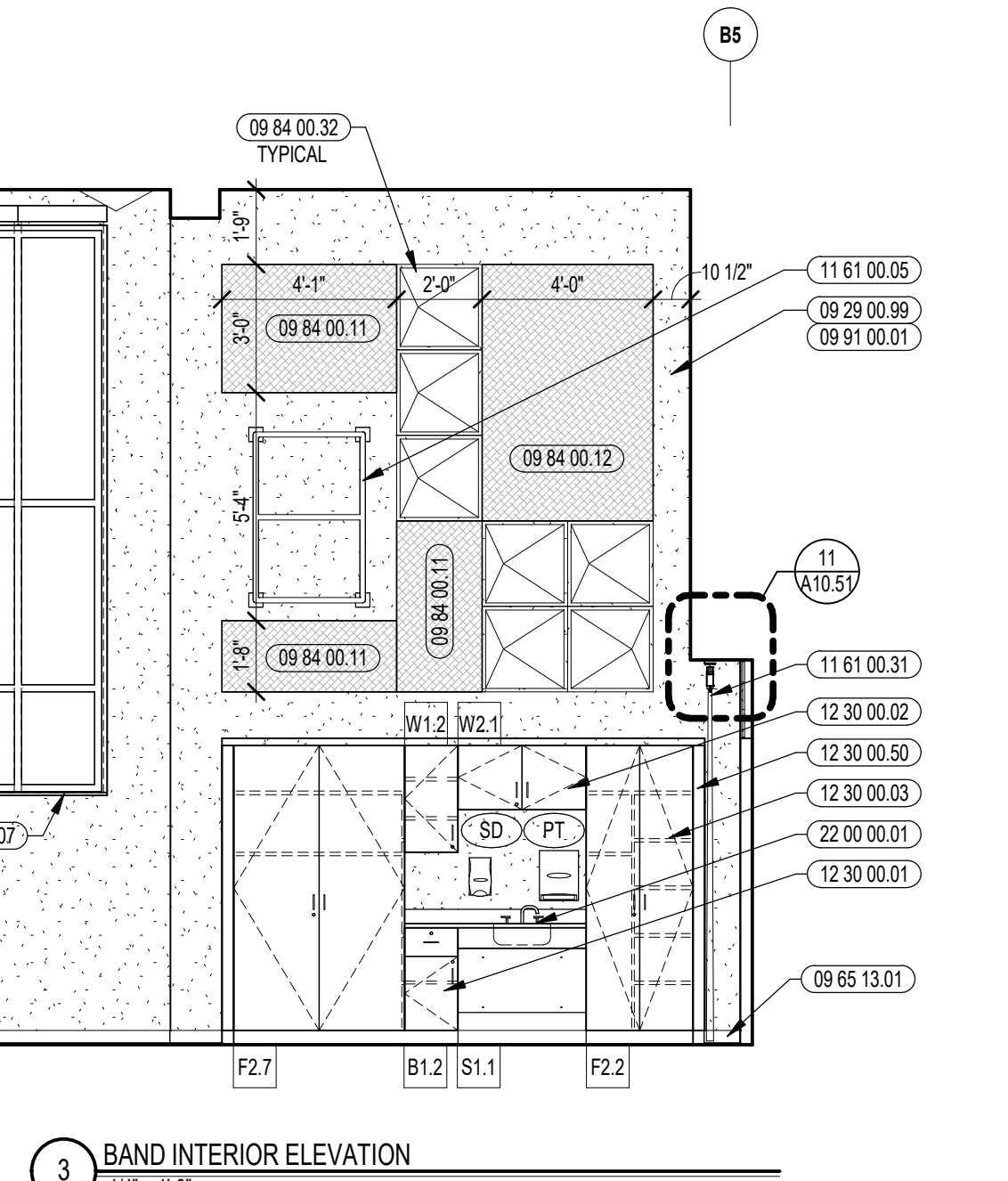
2 BAND INTERIOR ELEVATION 1/4" = 1'-0"



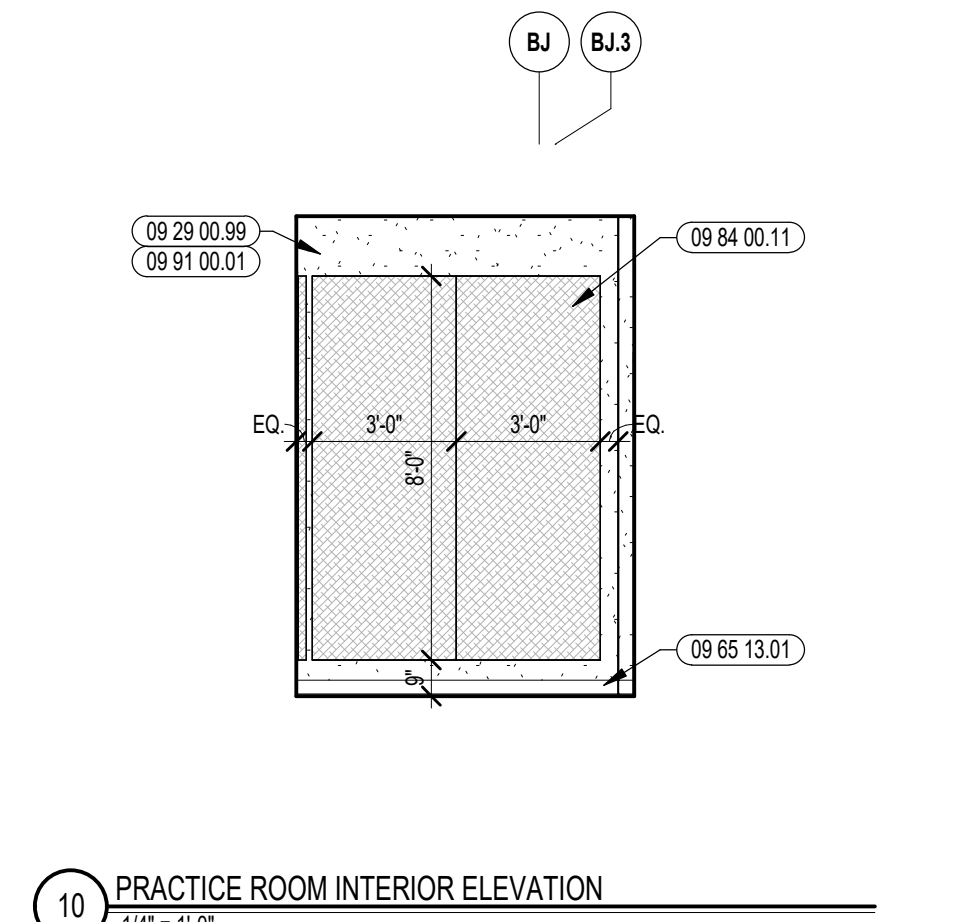
9 PRACTICE ROOM INTERIOR ELEVATION 1/4" = 1'-0"



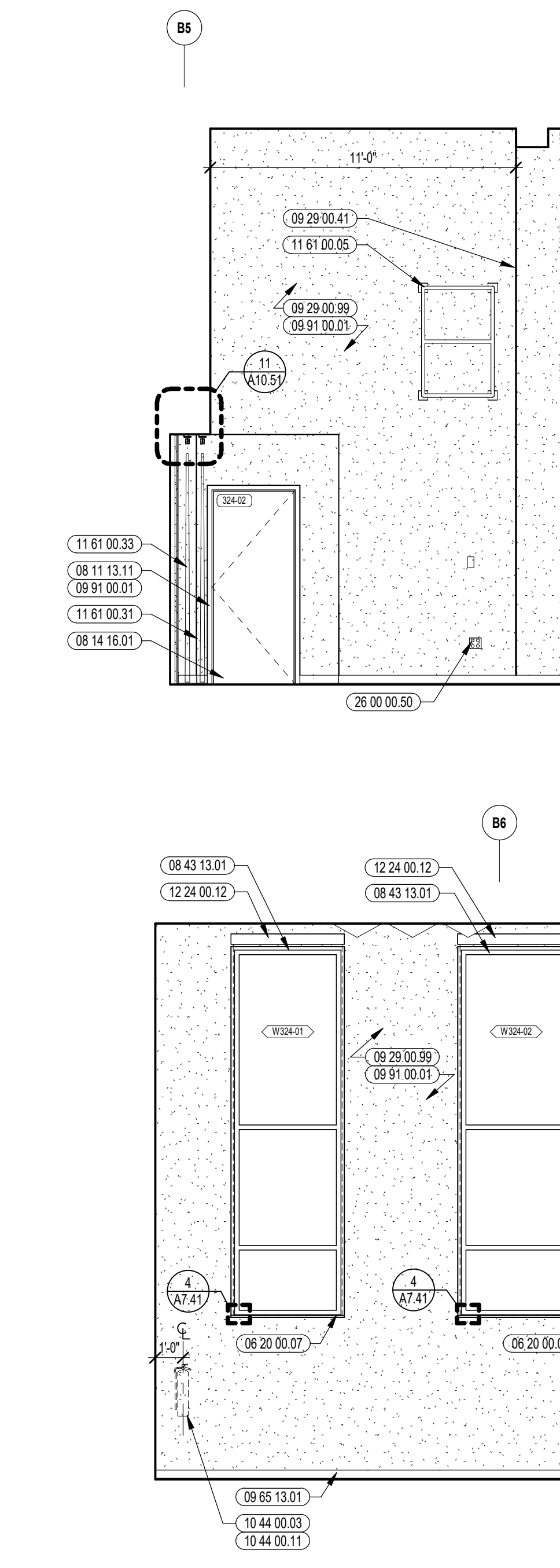
5 BAND INTERIOR ELEVATION 1/4" = 1'-0"



3 BAND INTERIOR ELEVATION 1/4" = 1'-0"



10 PRACTICE ROOM INTERIOR ELEVATION 1/4" = 1'-0"



1 BAND INTERIOR ELEVATION 1/4" = 1'-0"



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

KEYNOTE LEGEND:

- 06 20 00 07 HARDWOOD SILL - TRANSPARENT FINISH
- 08 11 13 11 STEEL FRAME - SEE SCHEDULE FOR TYPES
- 08 14 16 01 SOLID CORE FLUSH WOOD DOOR - SEE DOOR SCHEDULE
- 08 31 00 12 ACCESS PANEL - FIRE RATED
- 08 43 13 01 ALUMINUM STOREFRONT FRAME
- 09 21 16 11 METAL SHAFTWALL CH-STUD - 2 1/2 INCH - 24 INCHES O.C. MAX
- 09 21 16 21 GYPSUM SHAFTWALL LINER PANEL - 1 INCH
- 09 21 16 32 GYPSUM BOARD - 5/8 INCH TYPE X - 2 LAYERS
- 09 29 00 41 CONTROL JOINT - 1/4 INCH
- 09 29 00 99 GYPSUM BOARD SYSTEM - LEVEL 4 FINISH - REFER TO FLOOR PLANS AND WALL TYPES FOR COMPONENTS
- 09 51 00 06 ACT TYPE 6
- 09 51 00 08 RUBBER BASE - 4 INCH
- 09 84 00 11 ACOUSTICAL PANEL - WALL MOUNTED - FABRIC WRAPPED - TYPE 1
- 09 84 00 12 ACOUSTICAL PANEL - WALL MOUNTED - FABRIC WRAPPED - TYPE 4
- 09 84 00 32 ACOUSTICAL PANEL - WALL MOUNTED - PYRAMID PANEL - SEE SCHEDULE
- 09 91 00 01 PAINT - SEE SCHEDULE
- 10 11 16 01 DRY MARKER BOARD
- 10 11 16 11 TACK BOARD
- 10 44 00 03 FIRE EXTINGUISHER WALL MOUNTED BRACKET
- 10 44 00 11 FIRE EXTINGUISHER
- 12 24 00 02 ROLLER SHADE - ELECTRICALLY OPERATED
- 12 30 00 01 BASE CABINET
- 12 30 00 03 TALL CABINET
- 12 30 00 50 FILLER PIECE SORBED TO ADJACENT SURFACE - FINISH TO MATCH CABINETWORK
- 26 00 00 50 ELECTRICAL OUTLET - SEE TECHNOLOGY
- 27 10 00 10 DATA OUTLET - SEE TECHNOLOGY
- 27 40 00 20 DISPLAY - INTERACTIVE - SEE TECHNOLOGY

ACOUSTIC PANEL LEGEND

COLOR 1	COLOR 2	COLOR 3	COLOR 4
COLOR 5	COLOR 6		

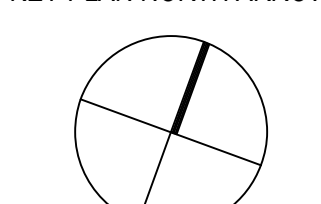
GENERAL NOTES:

1. NOT ALL POWER AND DATA OUTLET SWITCHING LOCATIONS SHOWN. COORDINATE WITH ELECTRICAL AND TECHNOLOGY DRAWINGS FOR ALL LOCATIONS.
2. REFER TO DETAILS ON A151 FOR FIRE EXTINGUISHER DETAILS AND MOUNTING HEIGHTS.
3. REFERENCE TO LET ACCESSORIES LEGEND AND SCHEDULE ON DRAWING A8.31 FOR ADDITIONAL INFORMATION.
4. WHERE EXPOSED, ALL STRUCTURAL MEMBERS & MEPP SHALL RECEIVE PAINTED FINISH U.N.O. HORIZONTAL PAINT TRANSITION LINE TO BE COORDINATED ON WALLS OF SPACES WITH EXPOSED DECKING.

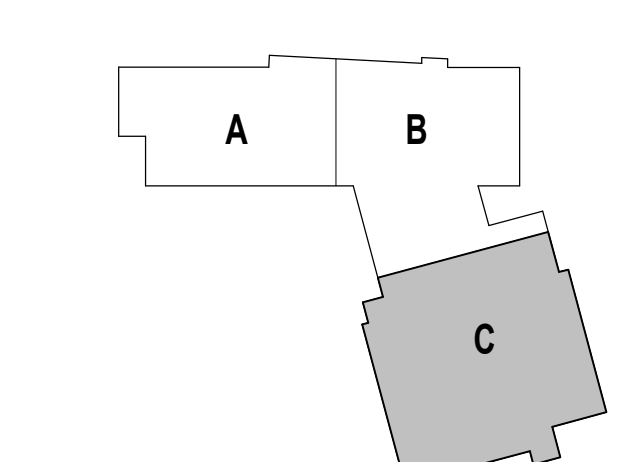
ADD-11 ADDENDUM #11 02.13.2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



KEYPLAN



DRAWING NAME:

CHORUS CLASSROOMS
ENLARGED PLAN AND
INTERIOR ELEVATIONS

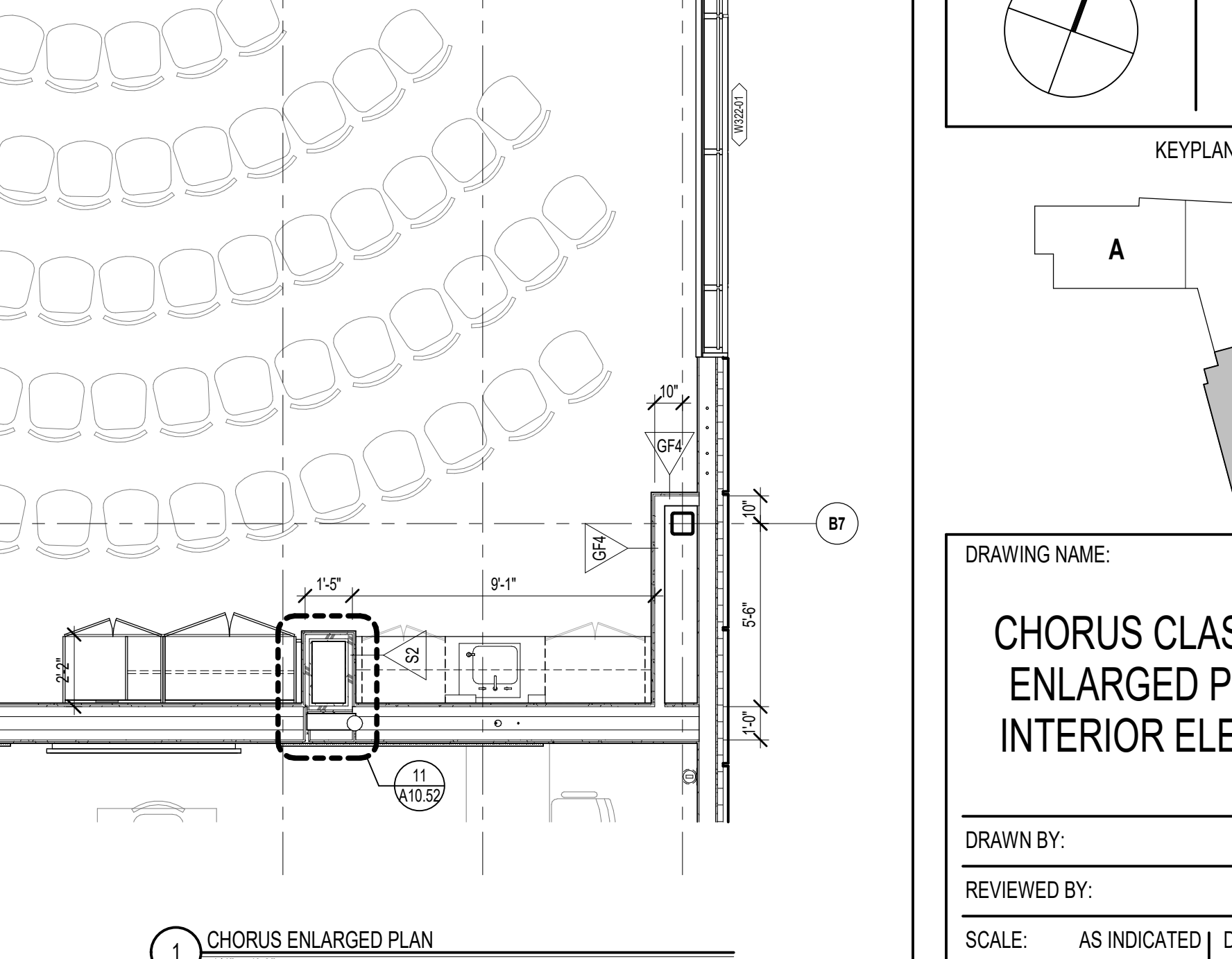
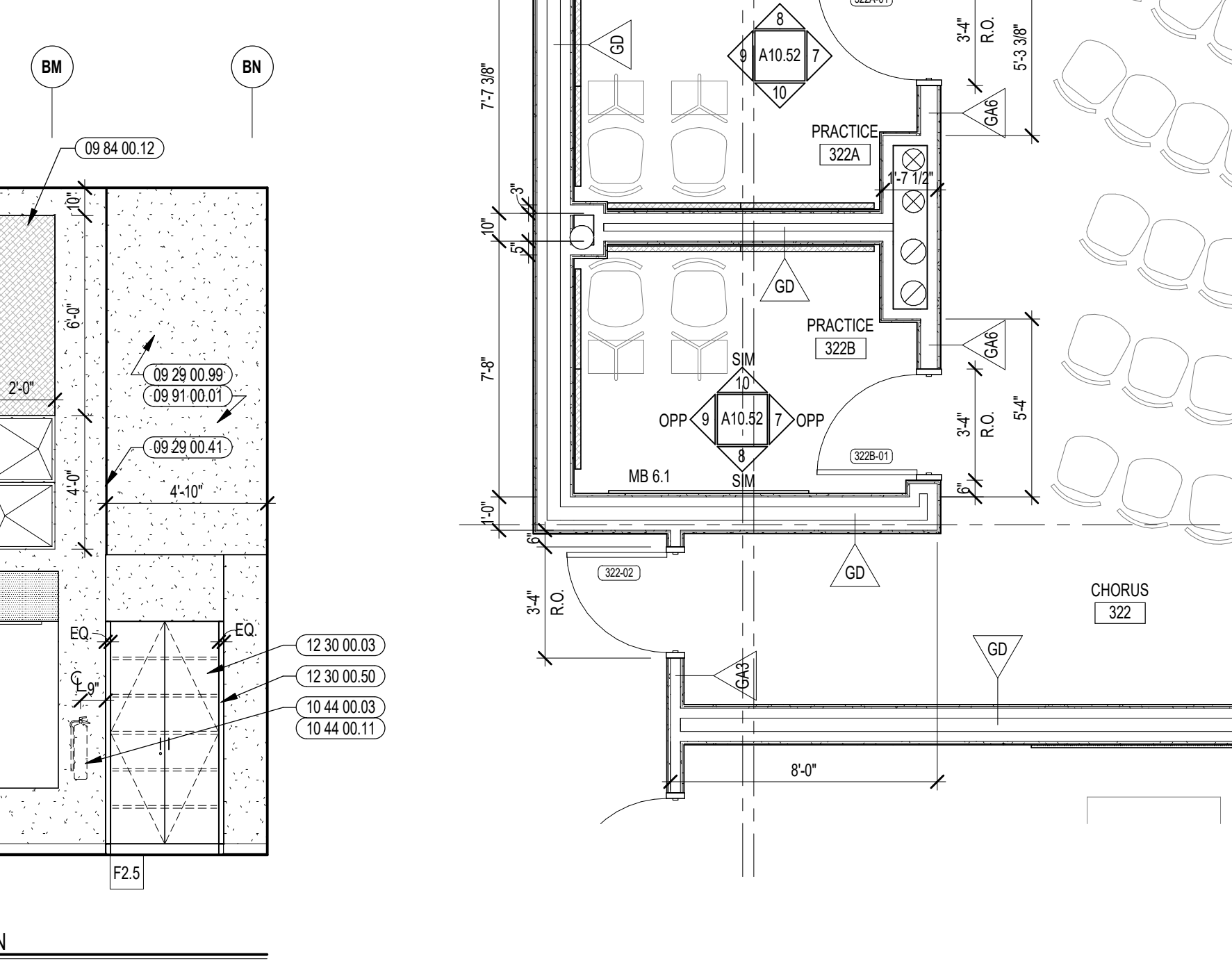
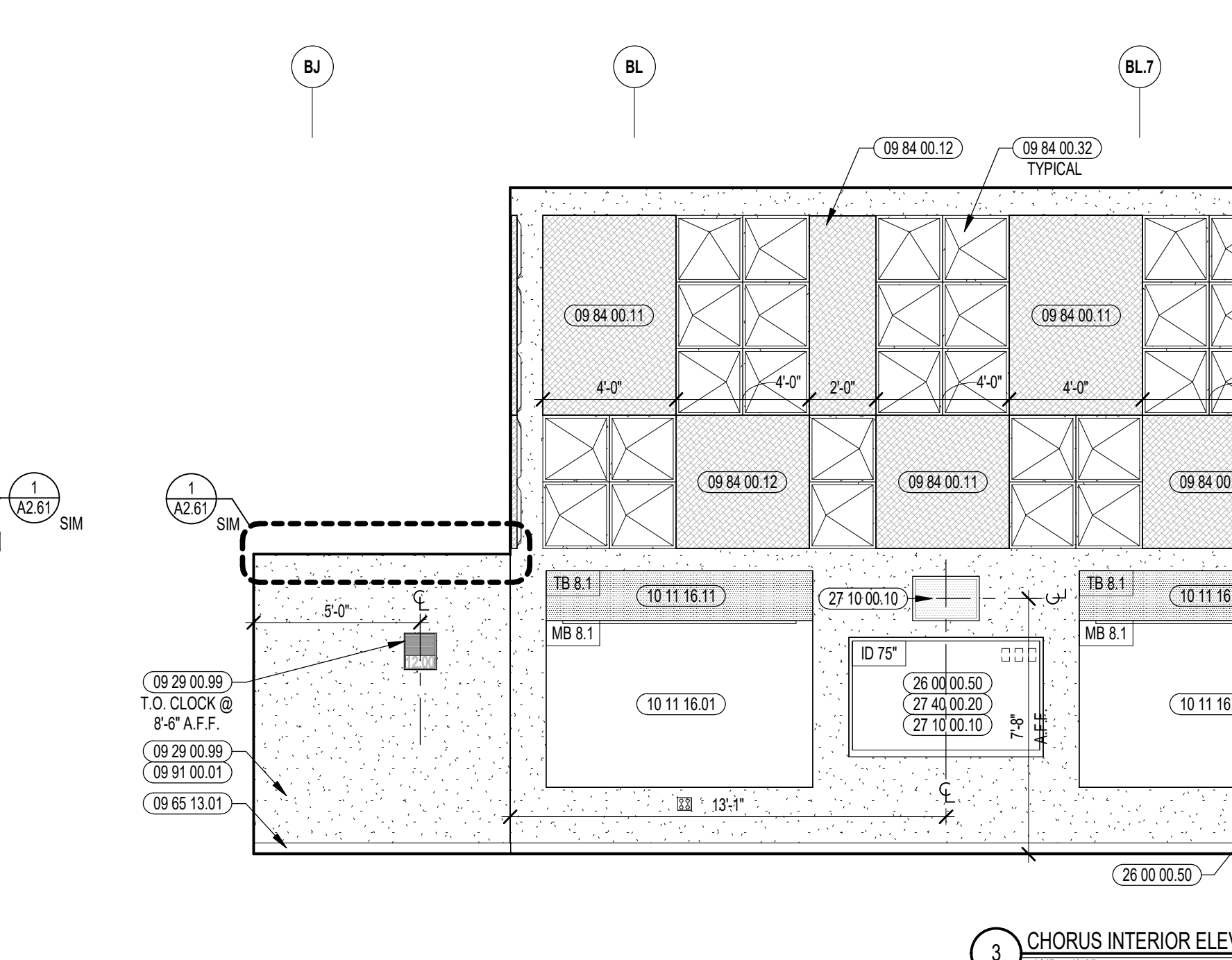
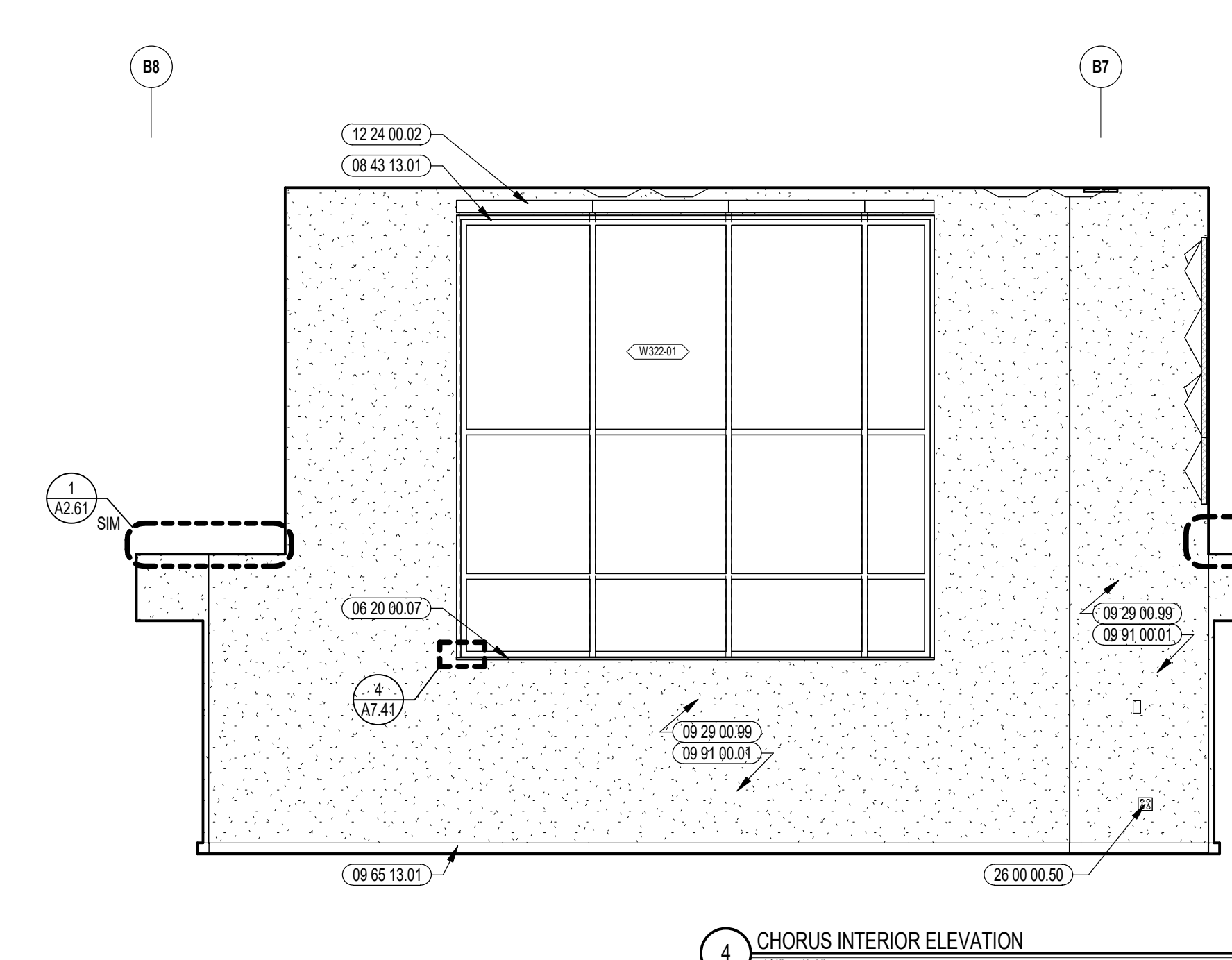
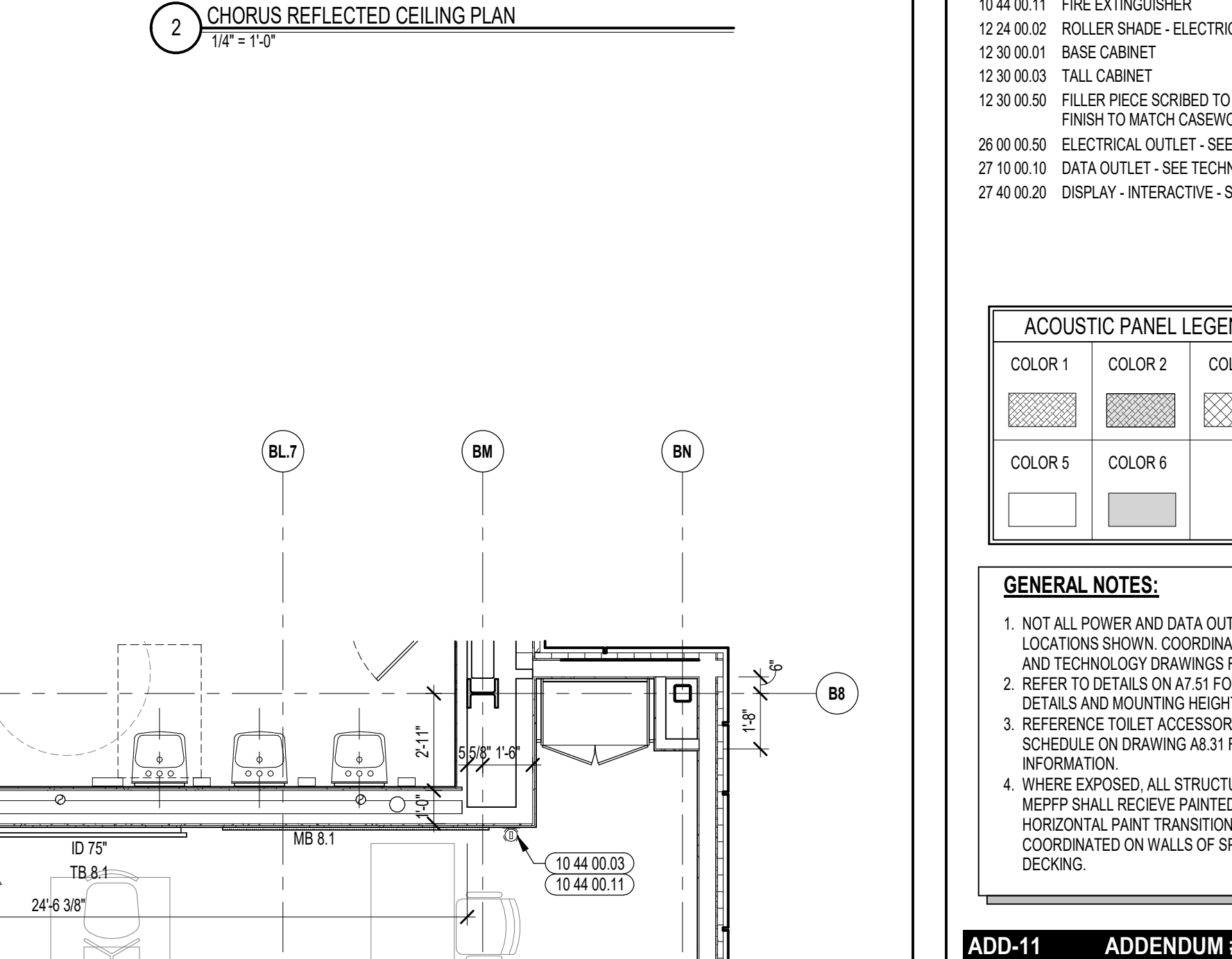
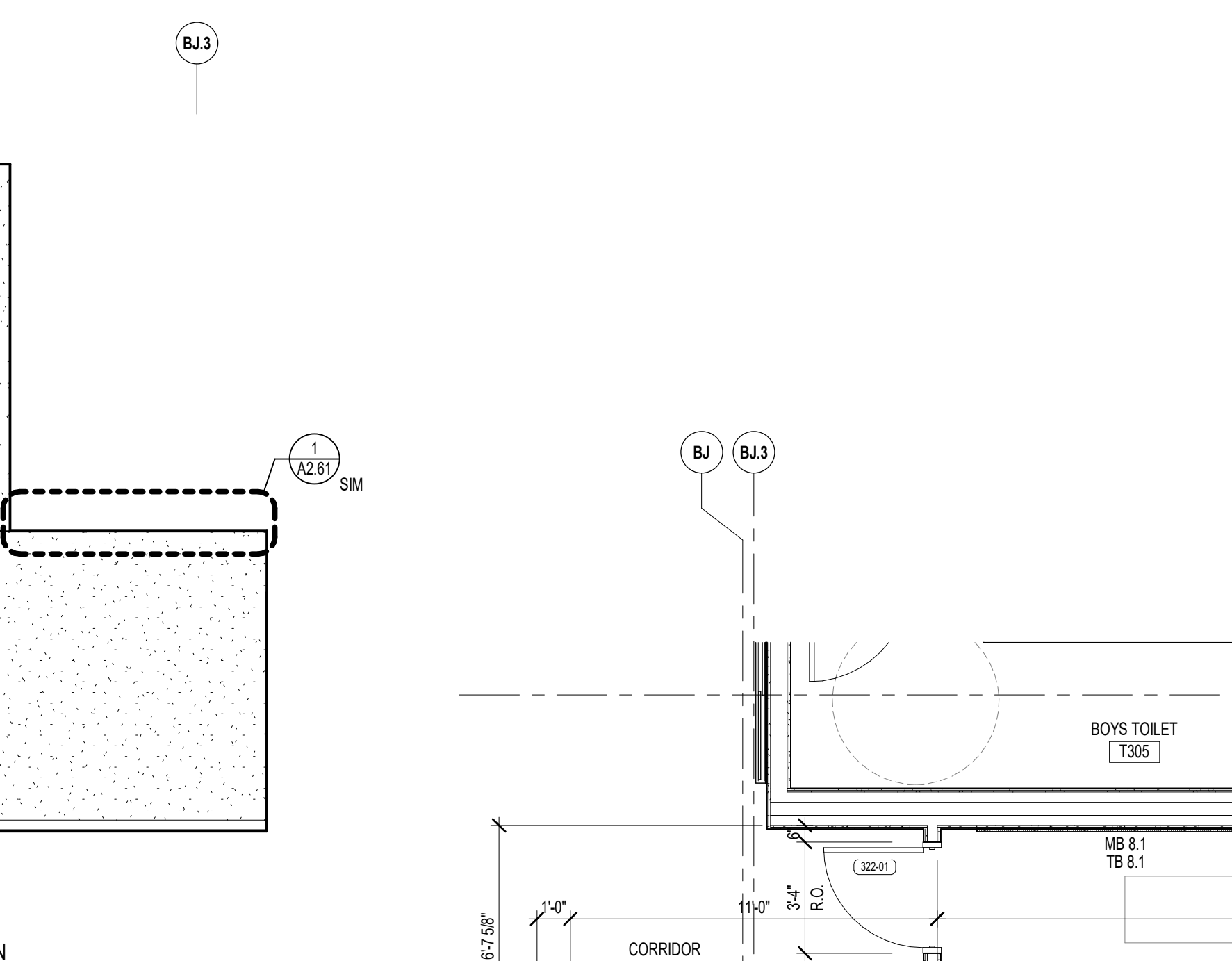
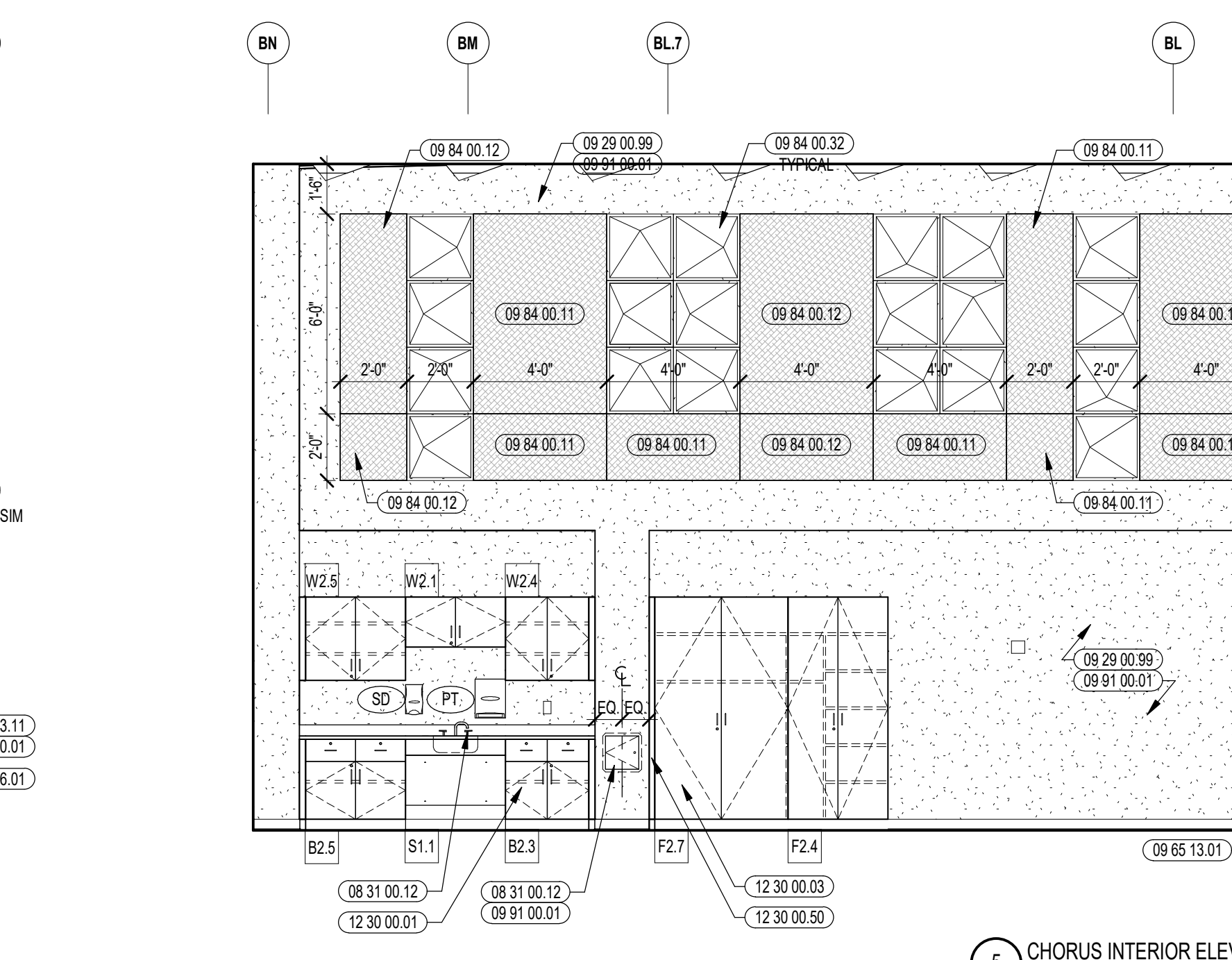
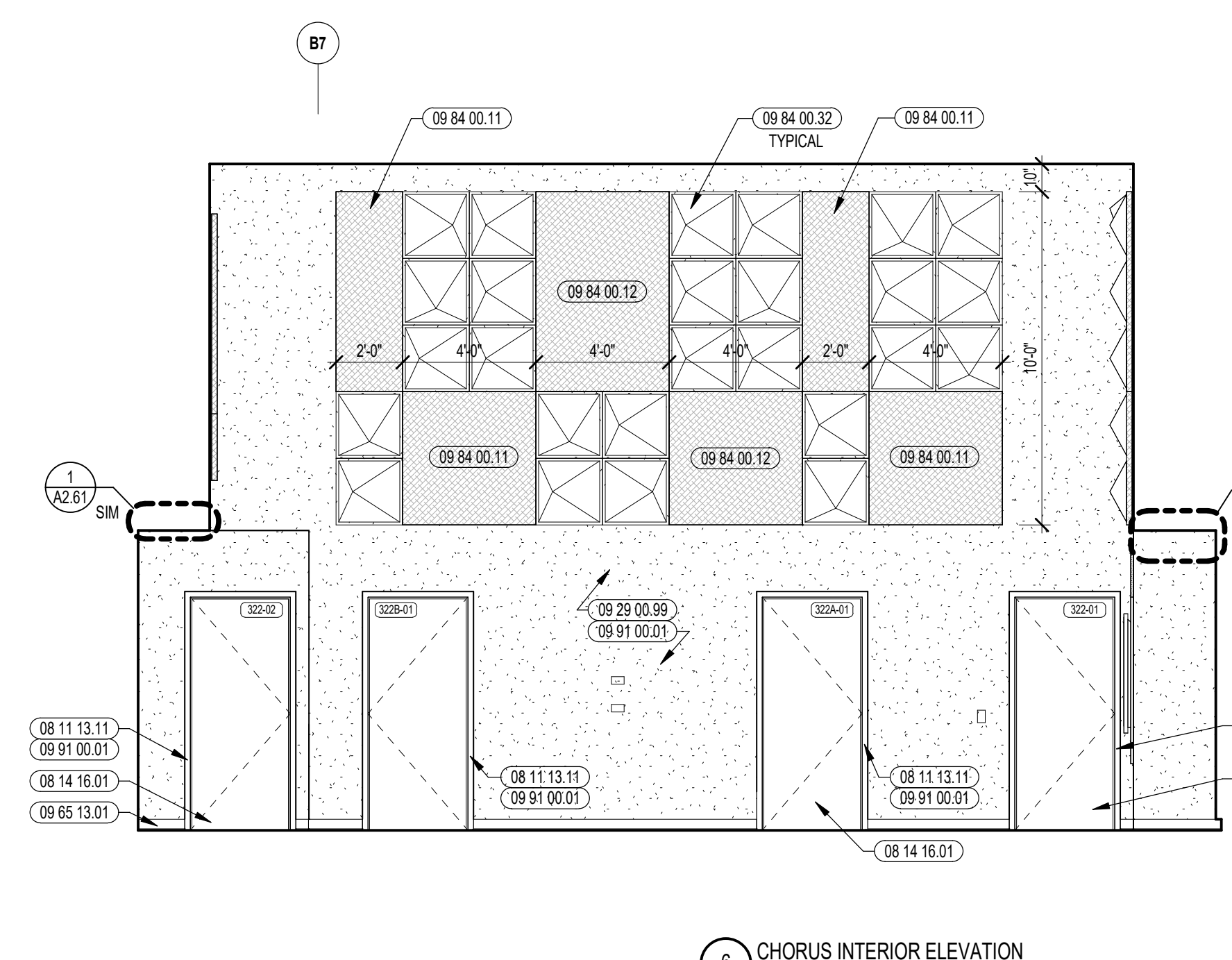
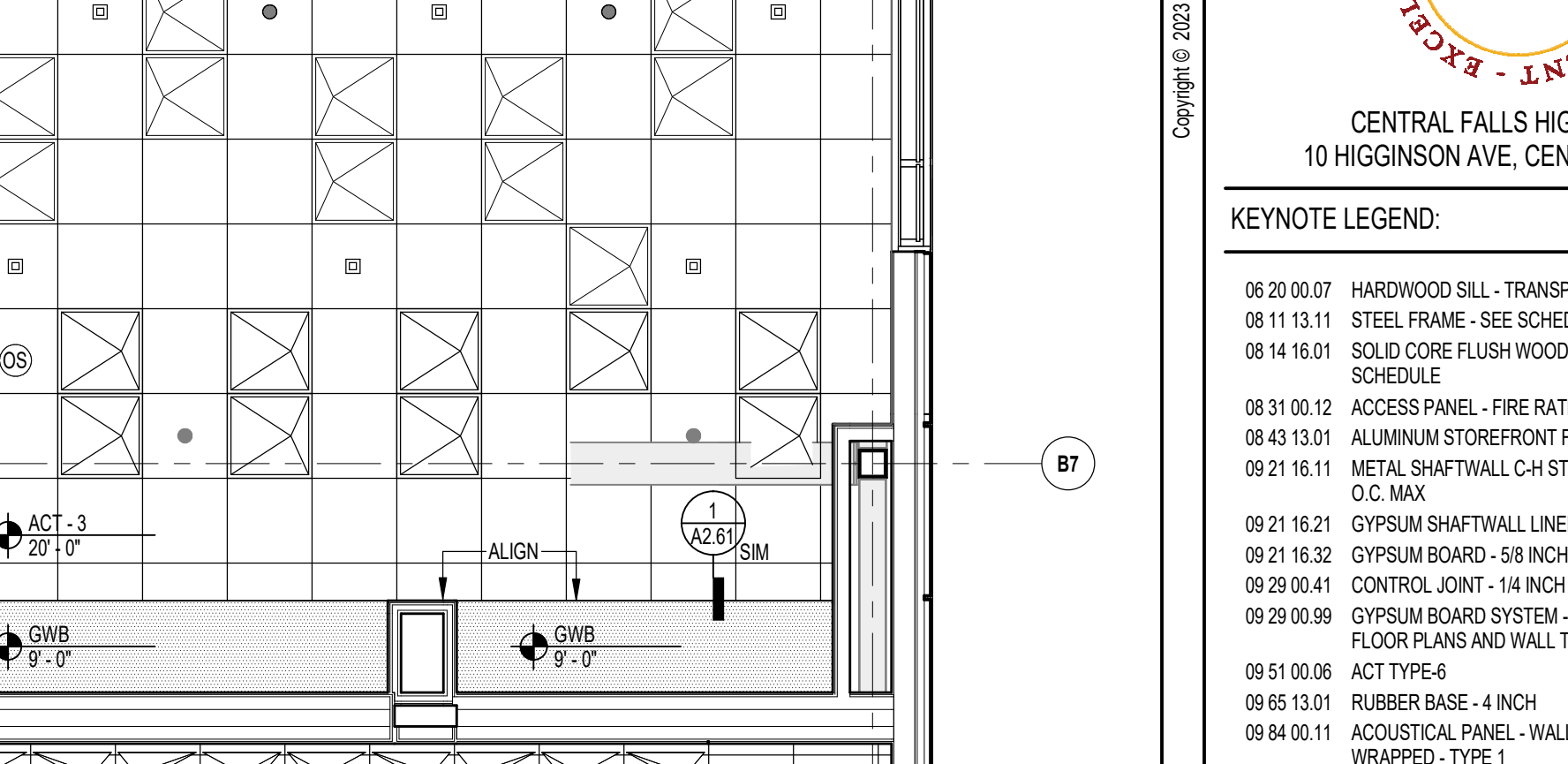
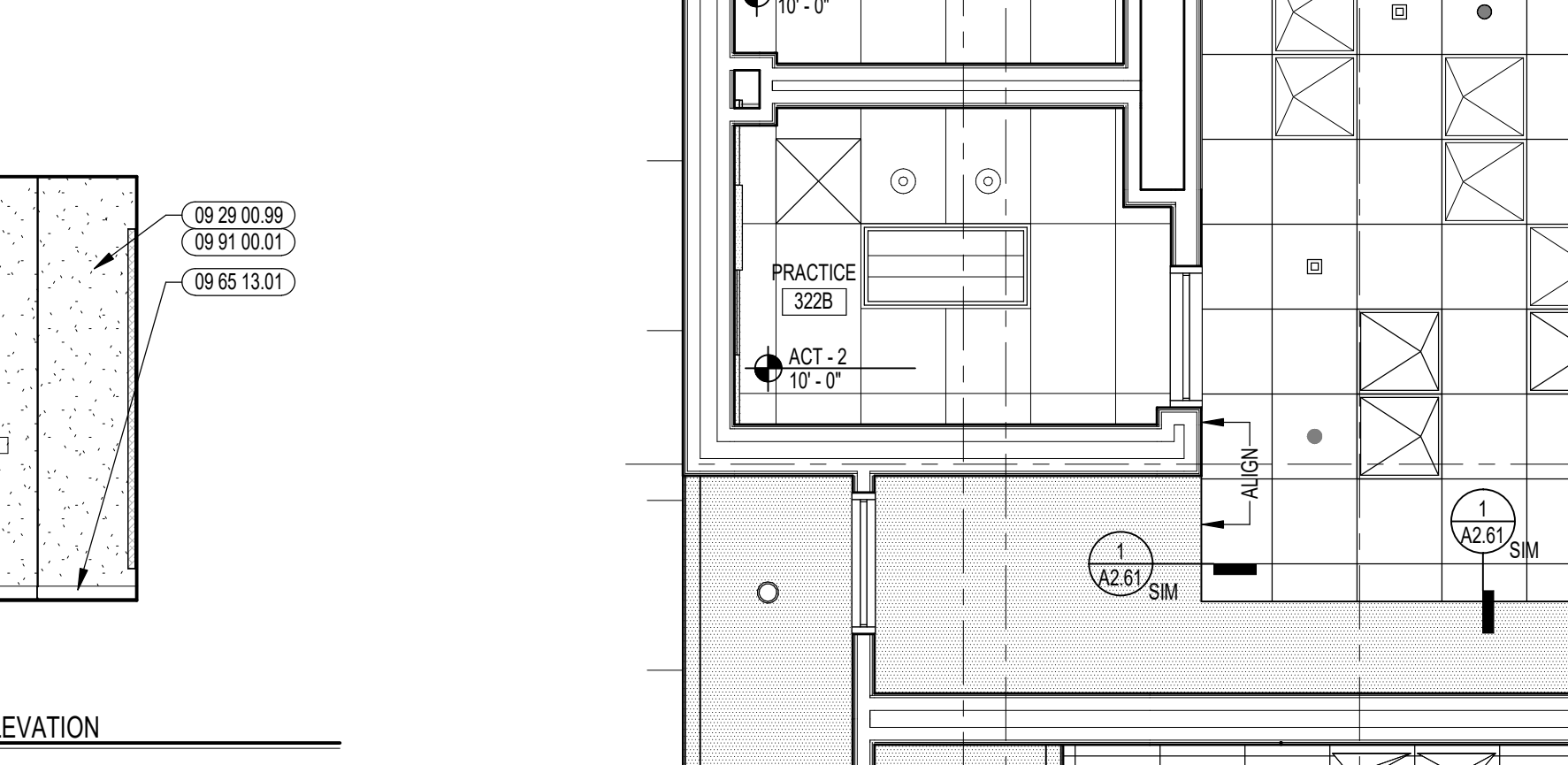
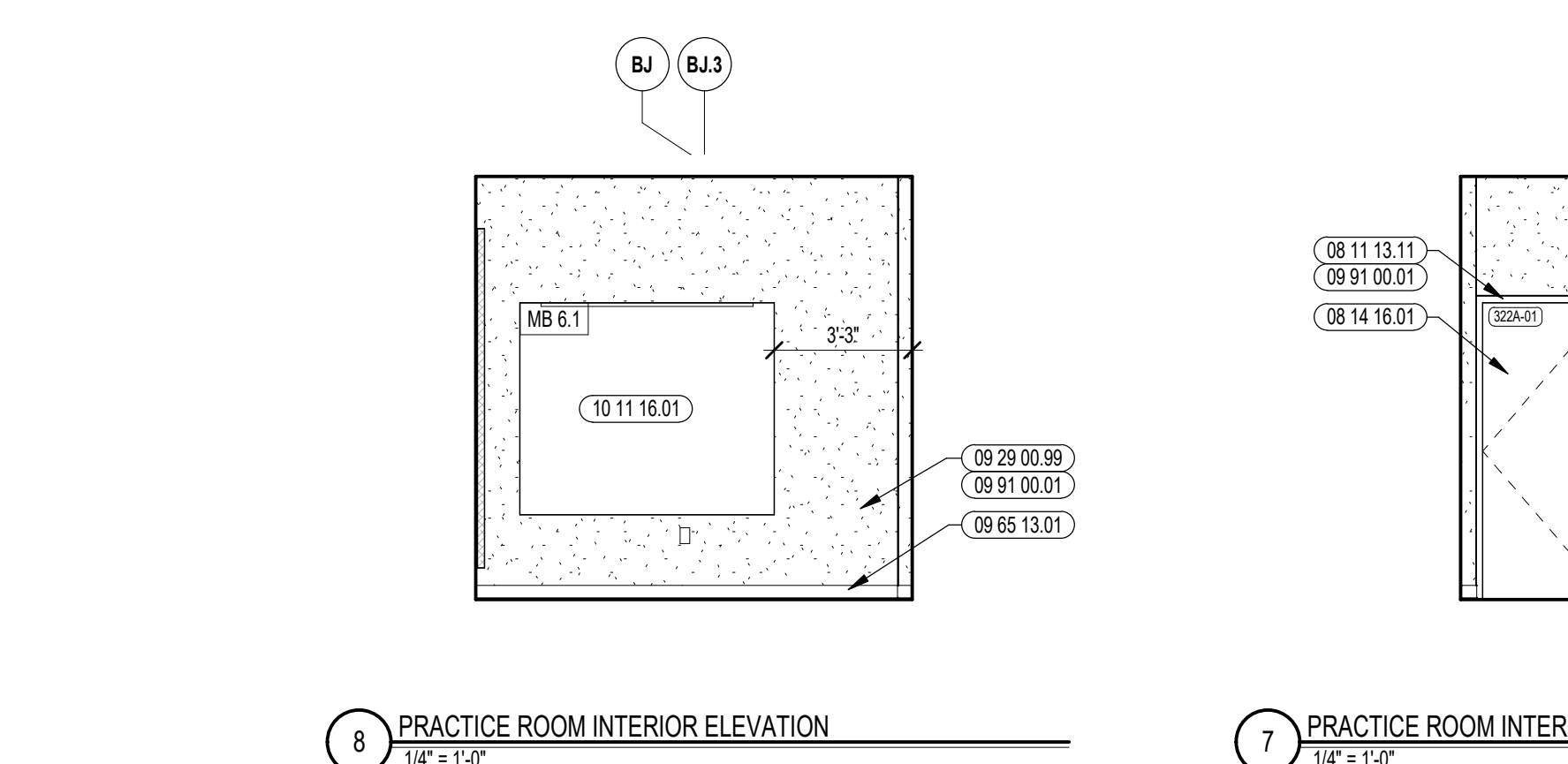
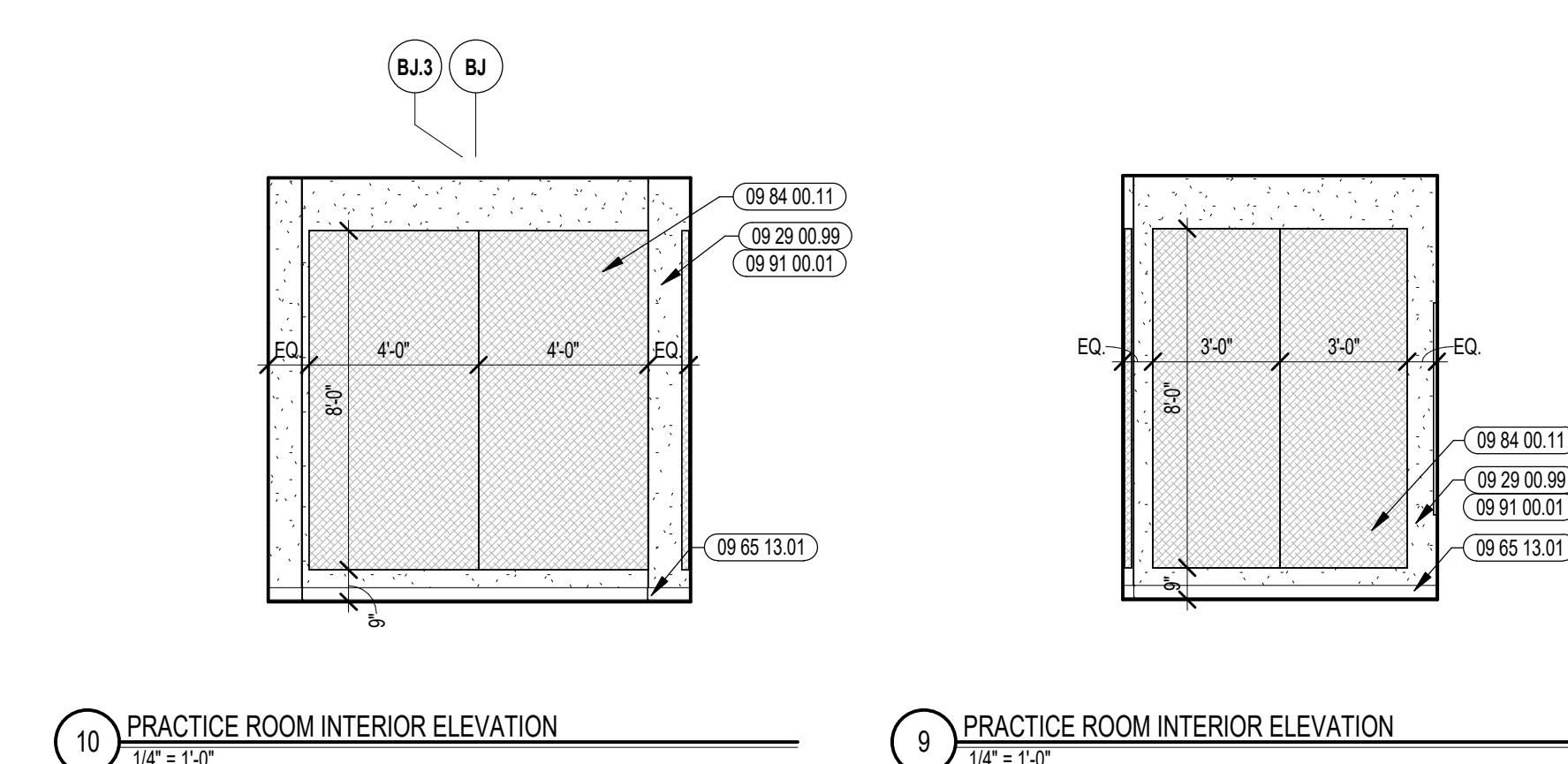
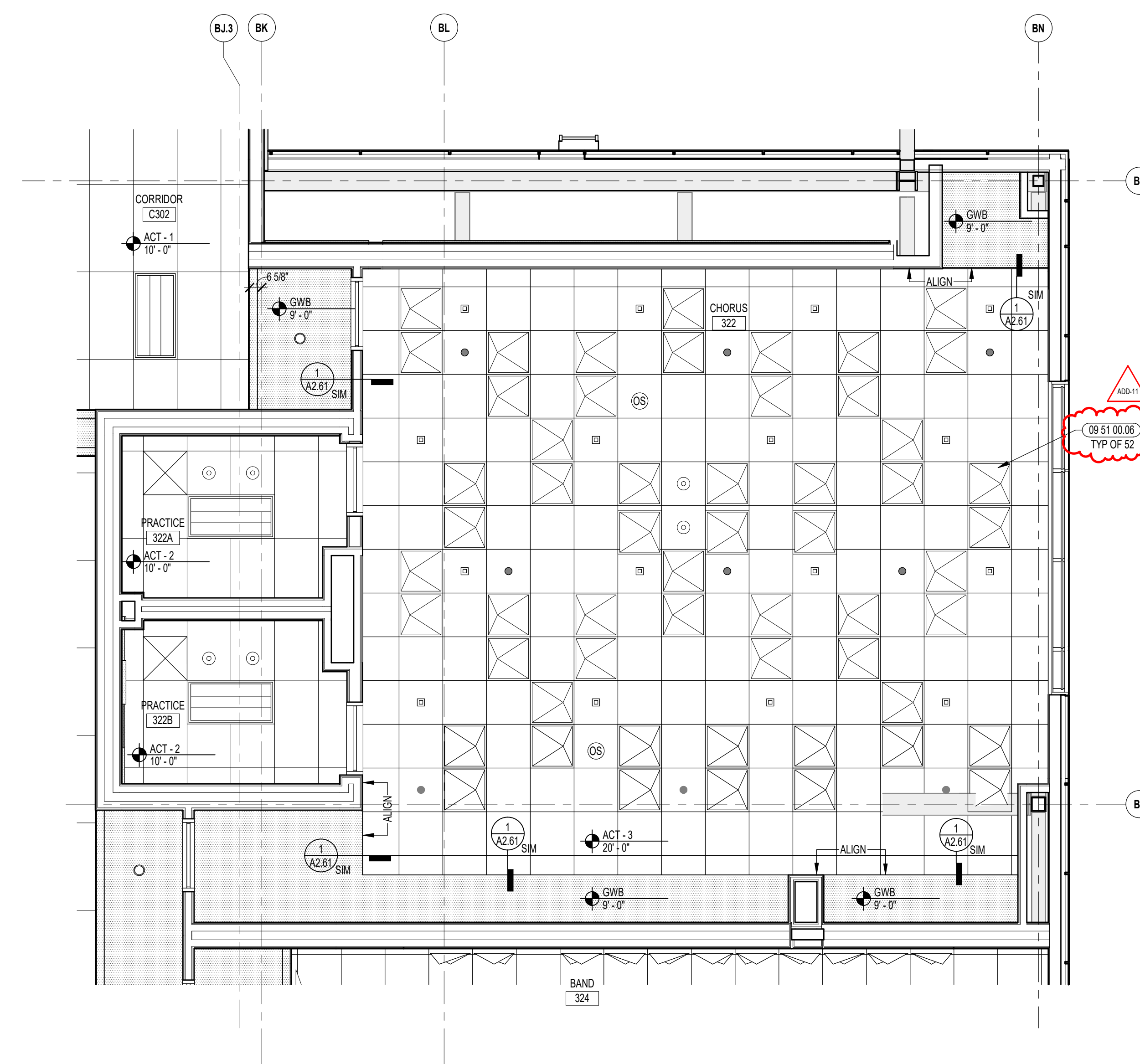
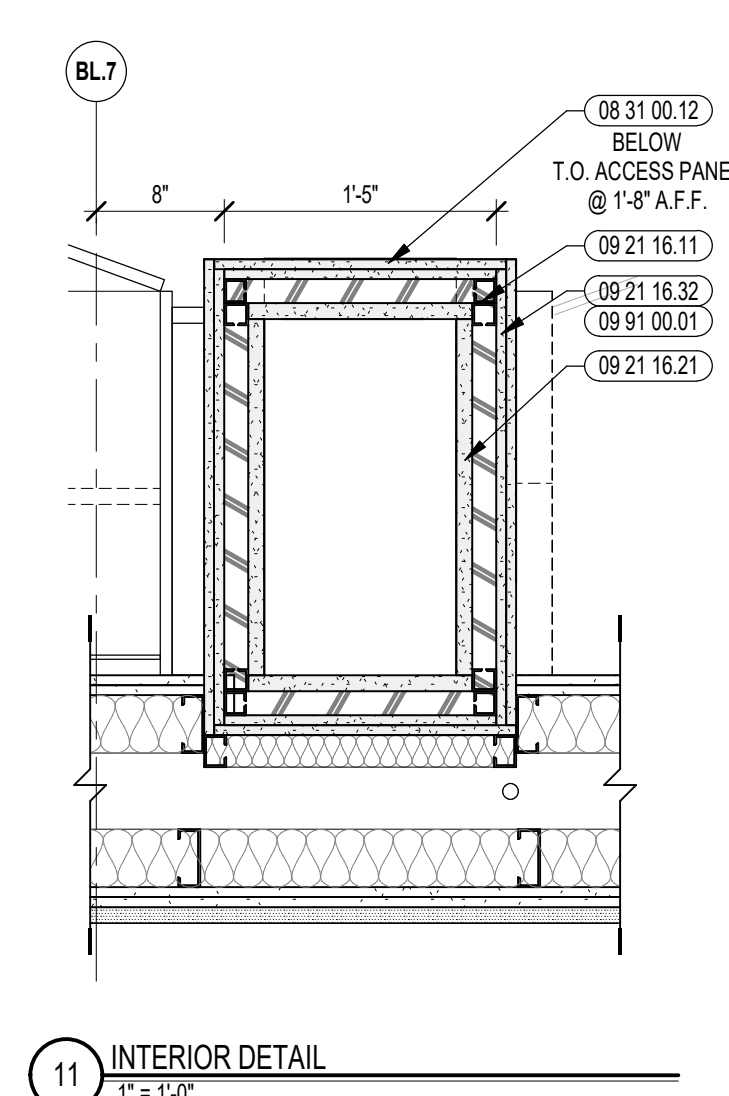
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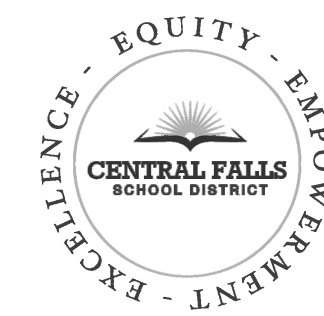
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JOB NO.: 2202.02

DATE: OCTOBER 13, 2023 **A10.52**





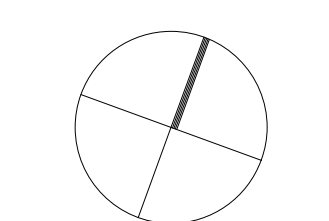
CENTRAL FALLS HIGH SCHOOL
10 HIGGINSON AVE, CENTRAL FALLS, RI

KEYNOTE LEGEND:

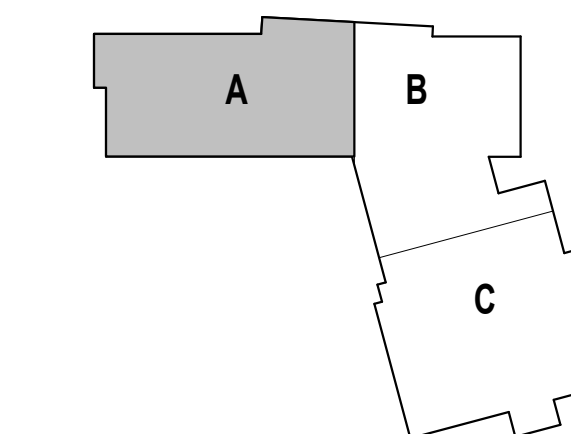
ADD-11 ADDENDUM 11 02/13/2024
3 ADDENDUM 3 01/09/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



KEYPLAN



DRAWING NAME:

**FIRE PROTECTION
FOURTH FLOOR
PLAN - ZONE A**

DRAWN BY: BSG

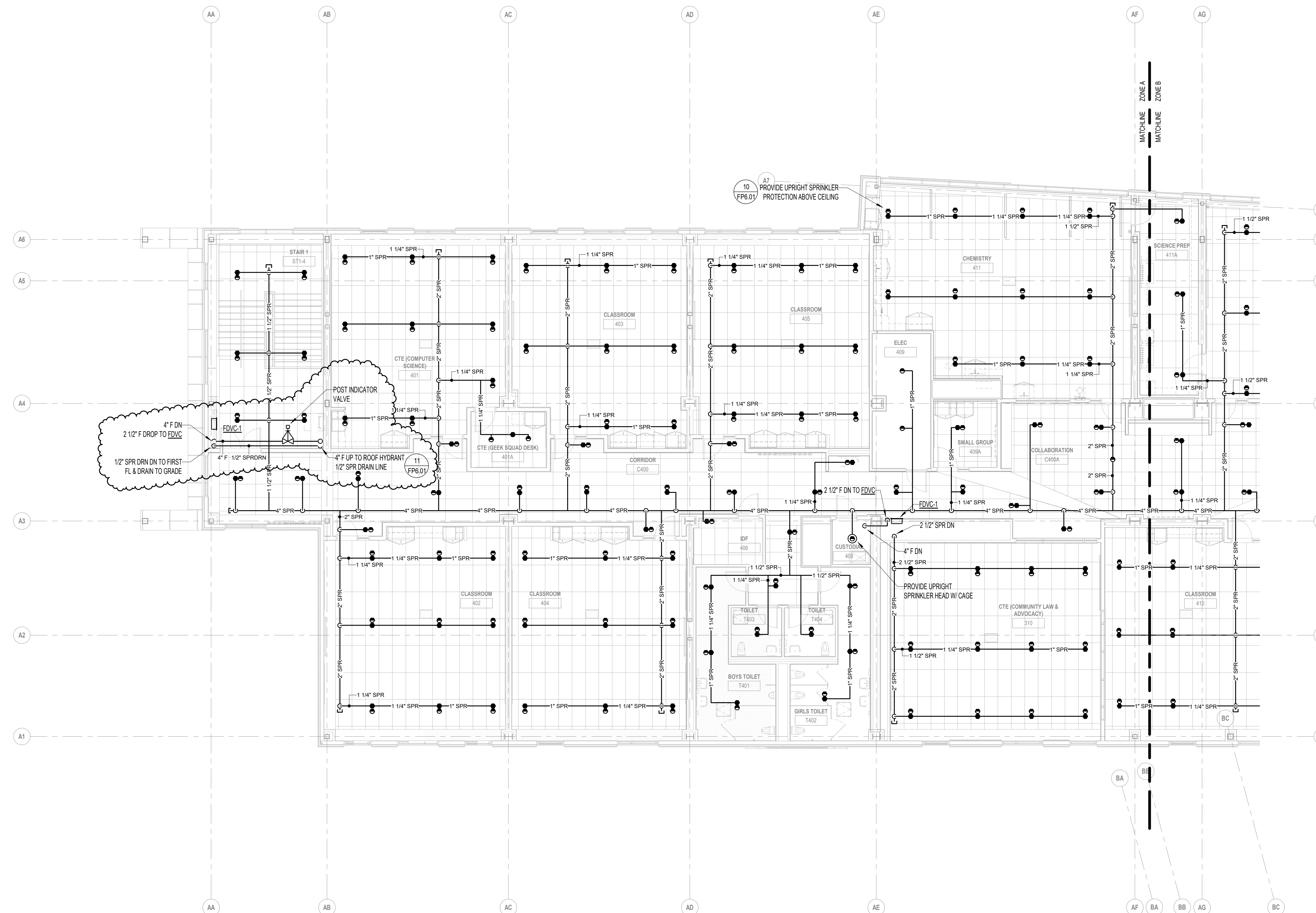
REVIEWED BY: AMD

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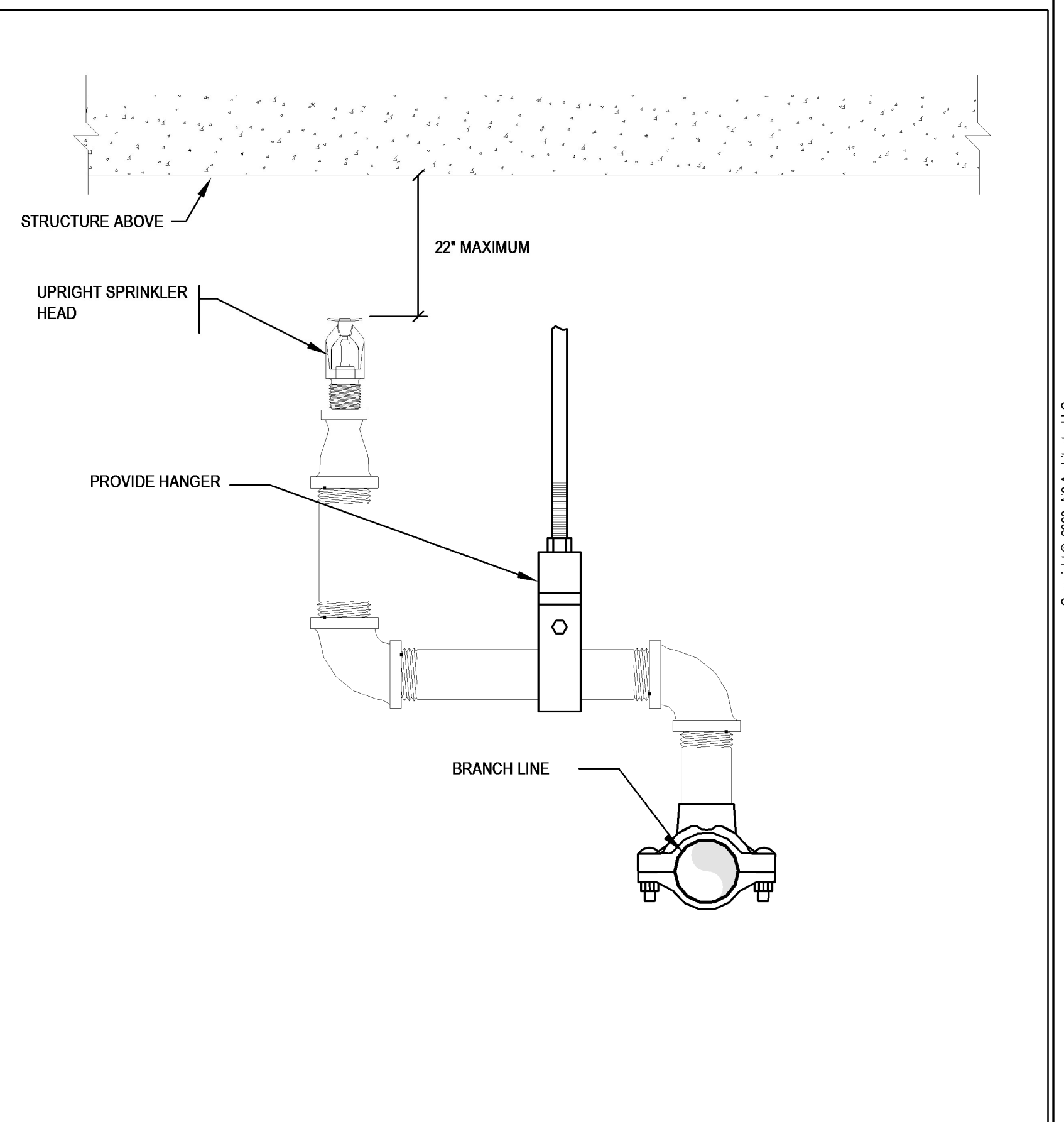
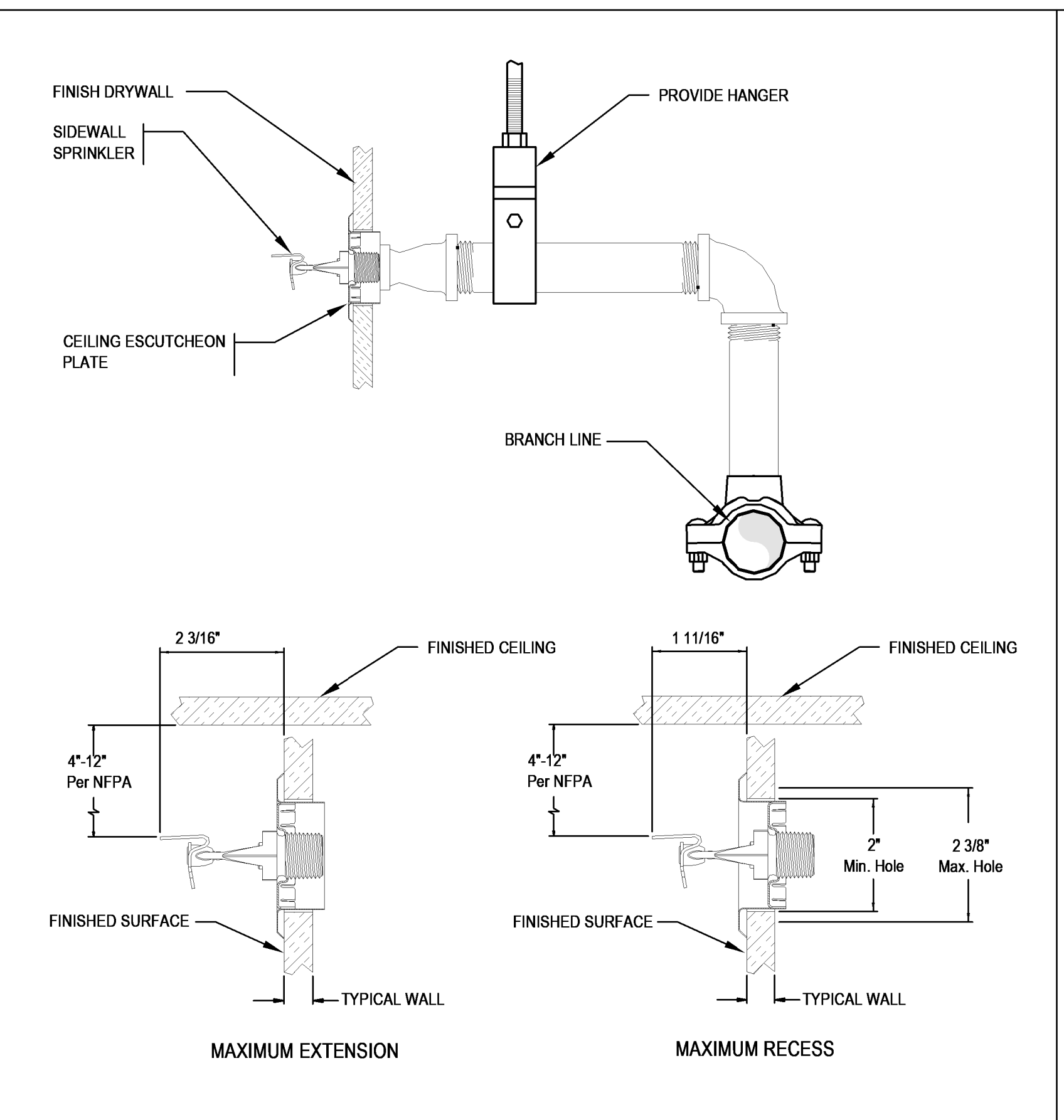
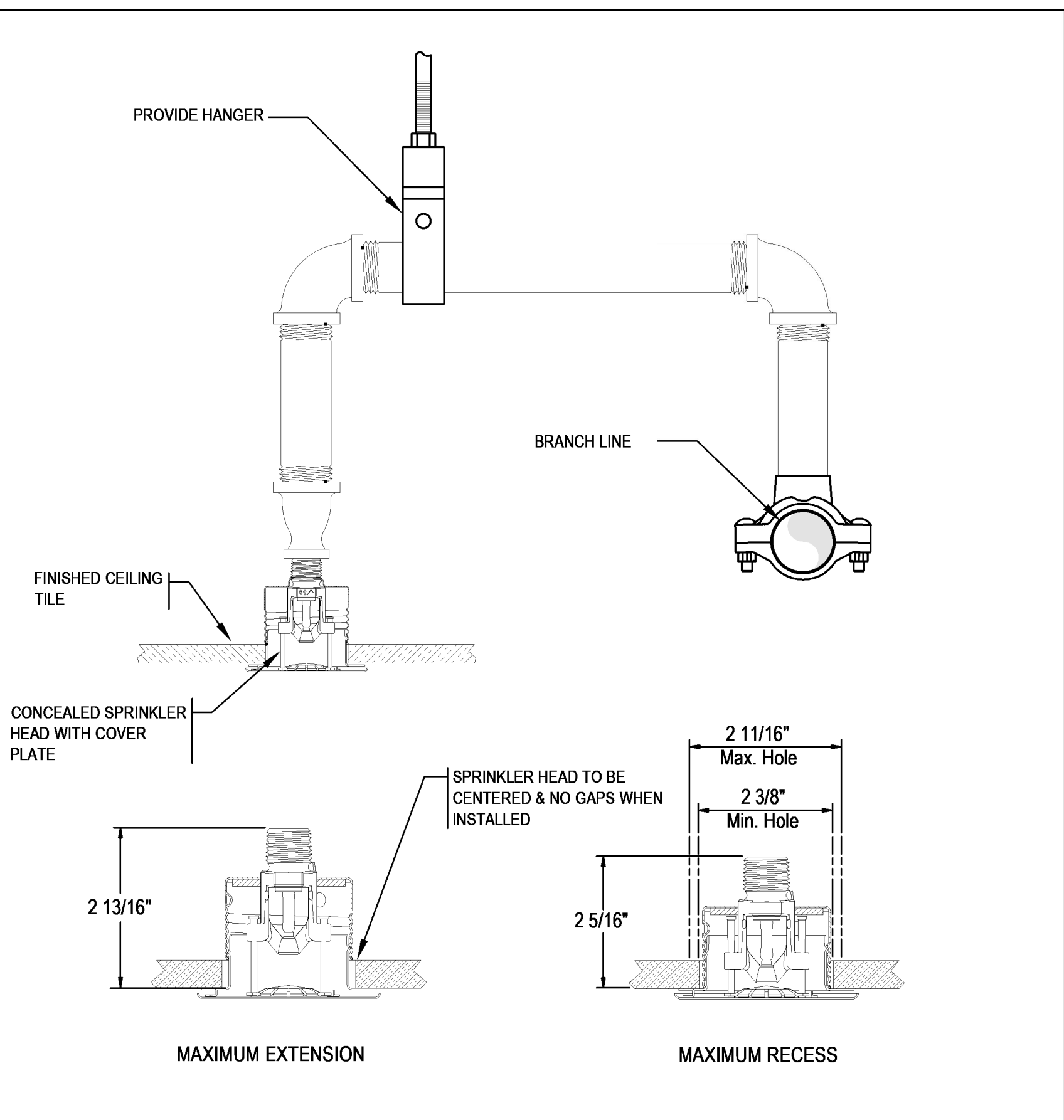
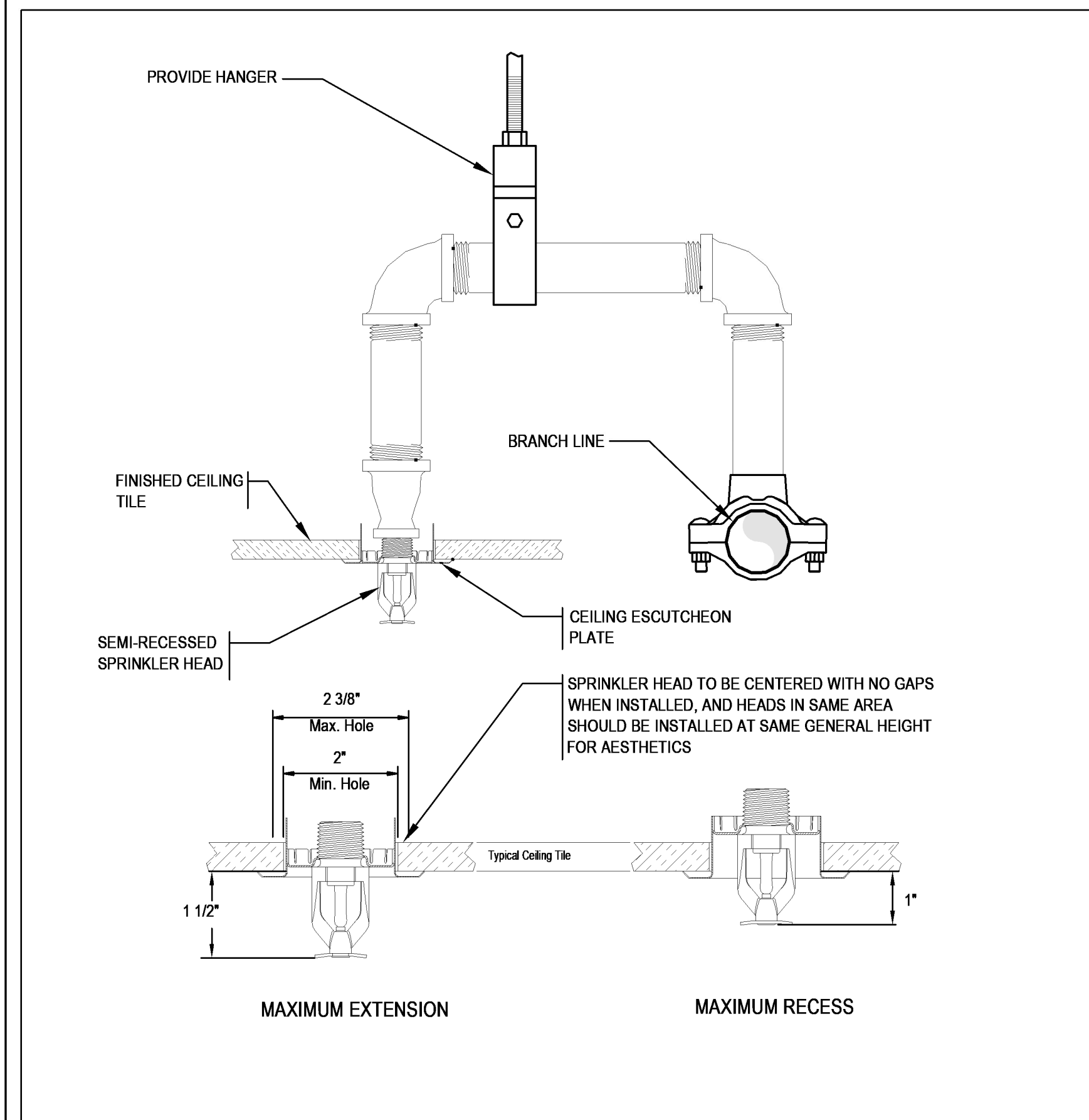
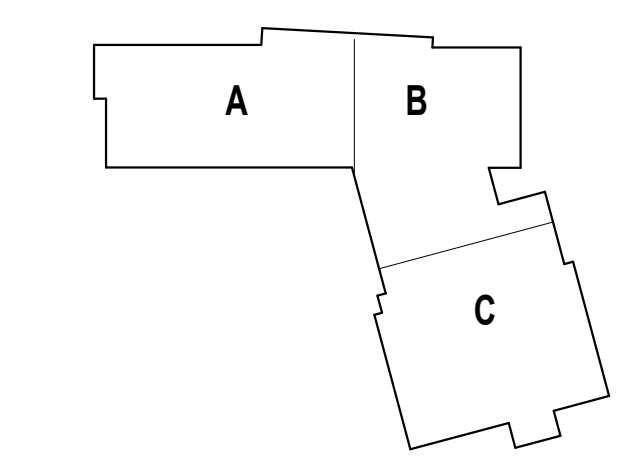
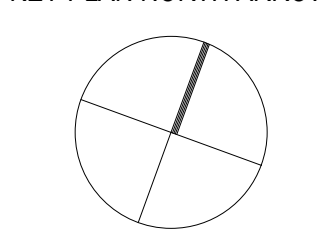
JOB NO.: 2202.02

DATE: OCTOBER 13, 2023

FP1.14A



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



NOTE: DETAIL IS DIAGRAMMATIC FOR INSTALLATION OF SPRINKLER HEAD. STRUCTURE INDICATED IS SHOWN FOR REPRESENTATION OF A STRUCTURE AND MAY VARY. STRUCTURE HAS NO RELEVANCE TO INTENT OF DETAIL.

NOTE: DETAIL IS DIAGRAMMATIC FOR INSTALLATION OF SPRINKLER HEAD. STRUCTURE INDICATED IS SHOWN FOR REPRESENTATION OF A STRUCTURE AND MAY VARY. STRUCTURE HAS NO RELEVANCE TO INTENT OF DETAIL.

NOTE: DETAIL IS DIAGRAMMATIC FOR INSTALLATION OF SPRINKLER HEAD. STRUCTURE INDICATED IS SHOWN FOR REPRESENTATION OF A STRUCTURE AND MAY VARY. STRUCTURE HAS NO RELEVANCE TO INTENT OF DETAIL.

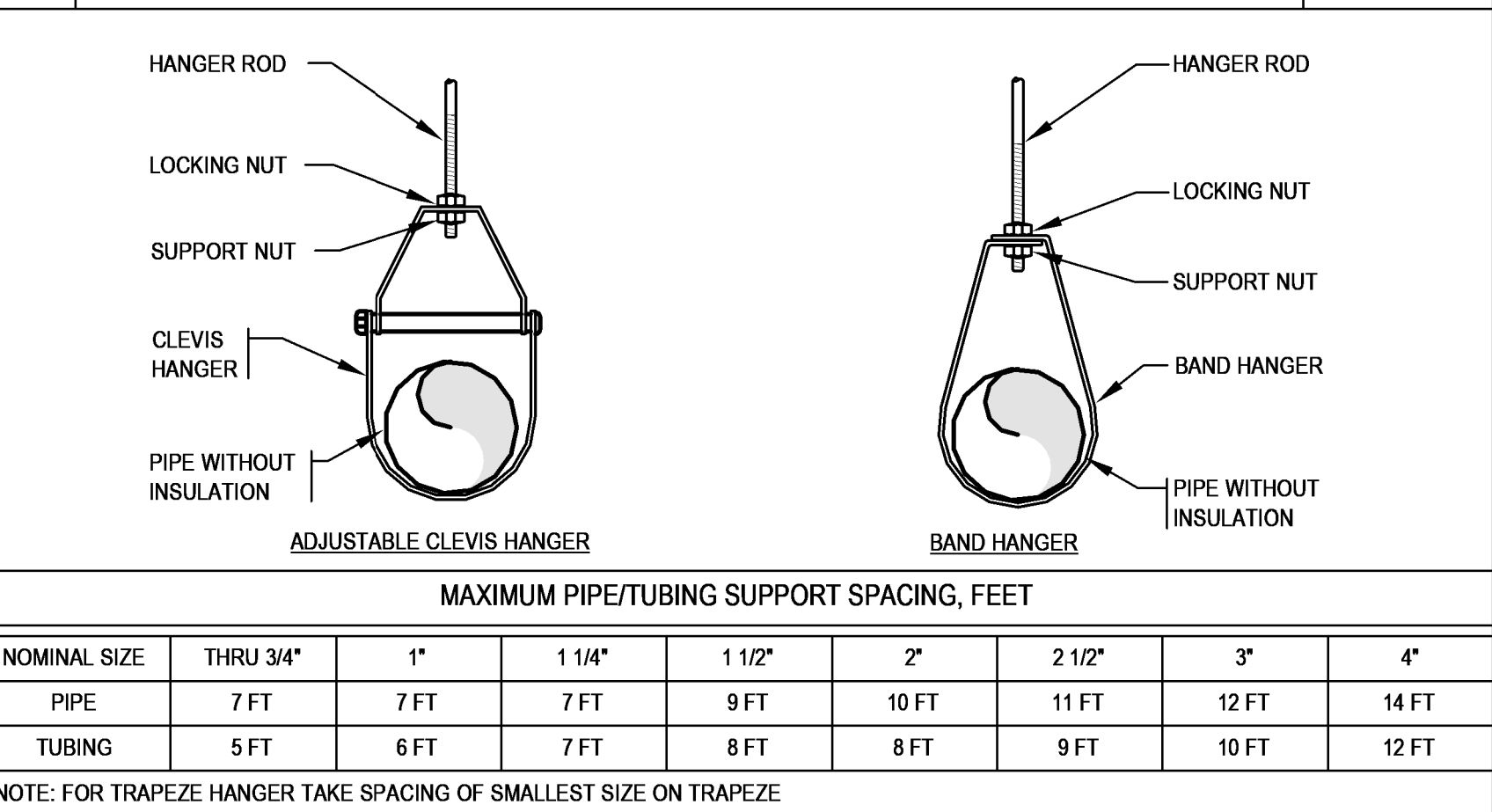
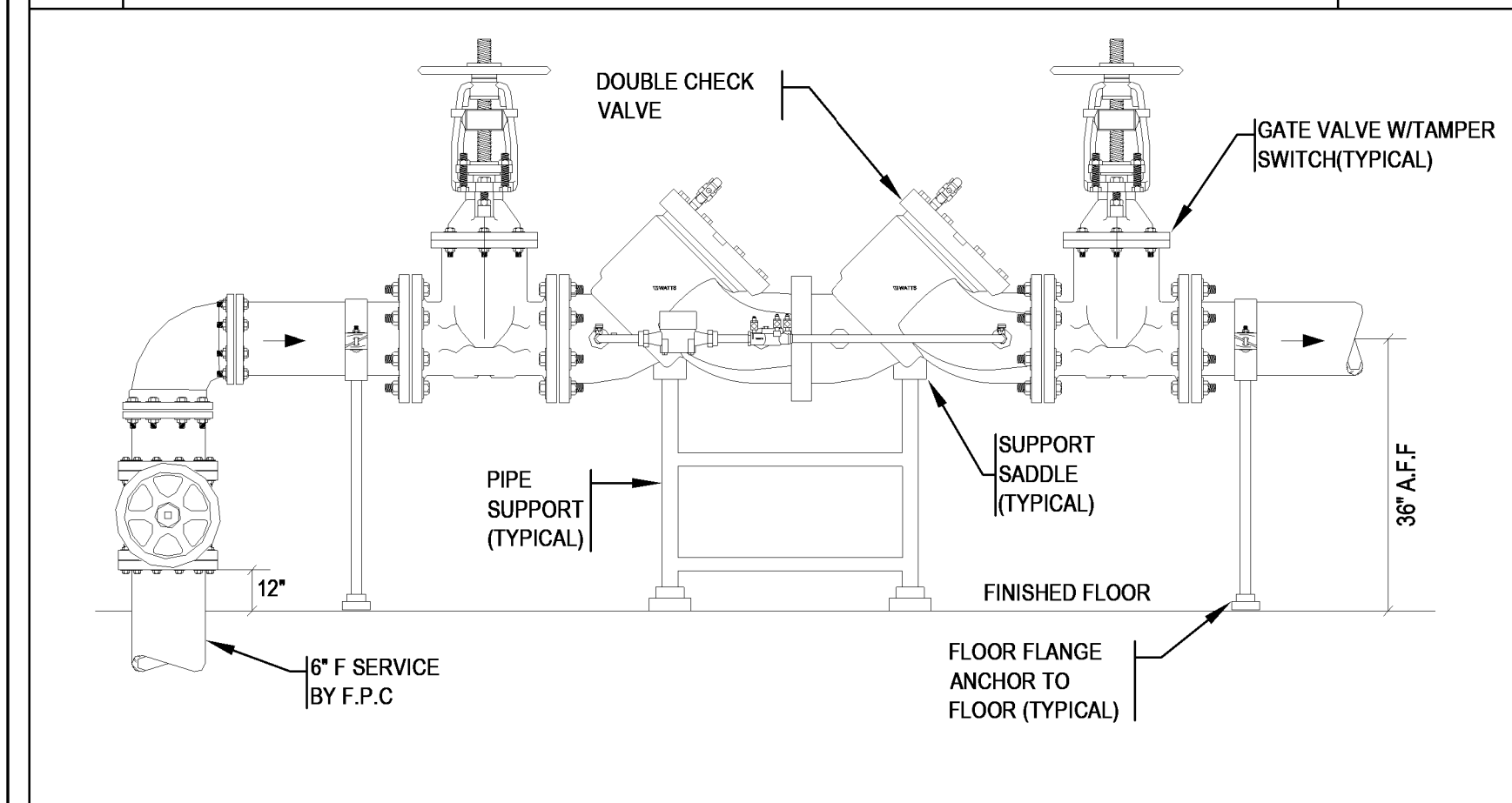
NOTE: DETAIL IS DIAGRAMMATIC FOR INSTALLATION OF SPRINKLER HEAD. STRUCTURE INDICATED IS SHOWN FOR REPRESENTATION OF A STRUCTURE AND MAY VARY. STRUCTURE HAS NO RELEVANCE TO INTENT OF DETAIL.

1 SEMI-RECESSED ARM-OVER BRANCH SPRINKLER PIPING SCALE NOT TO SCALE

2 CONCEALED ARM-OVER BRANCH SPRINKLER PIPING SCALE NOT TO SCALE

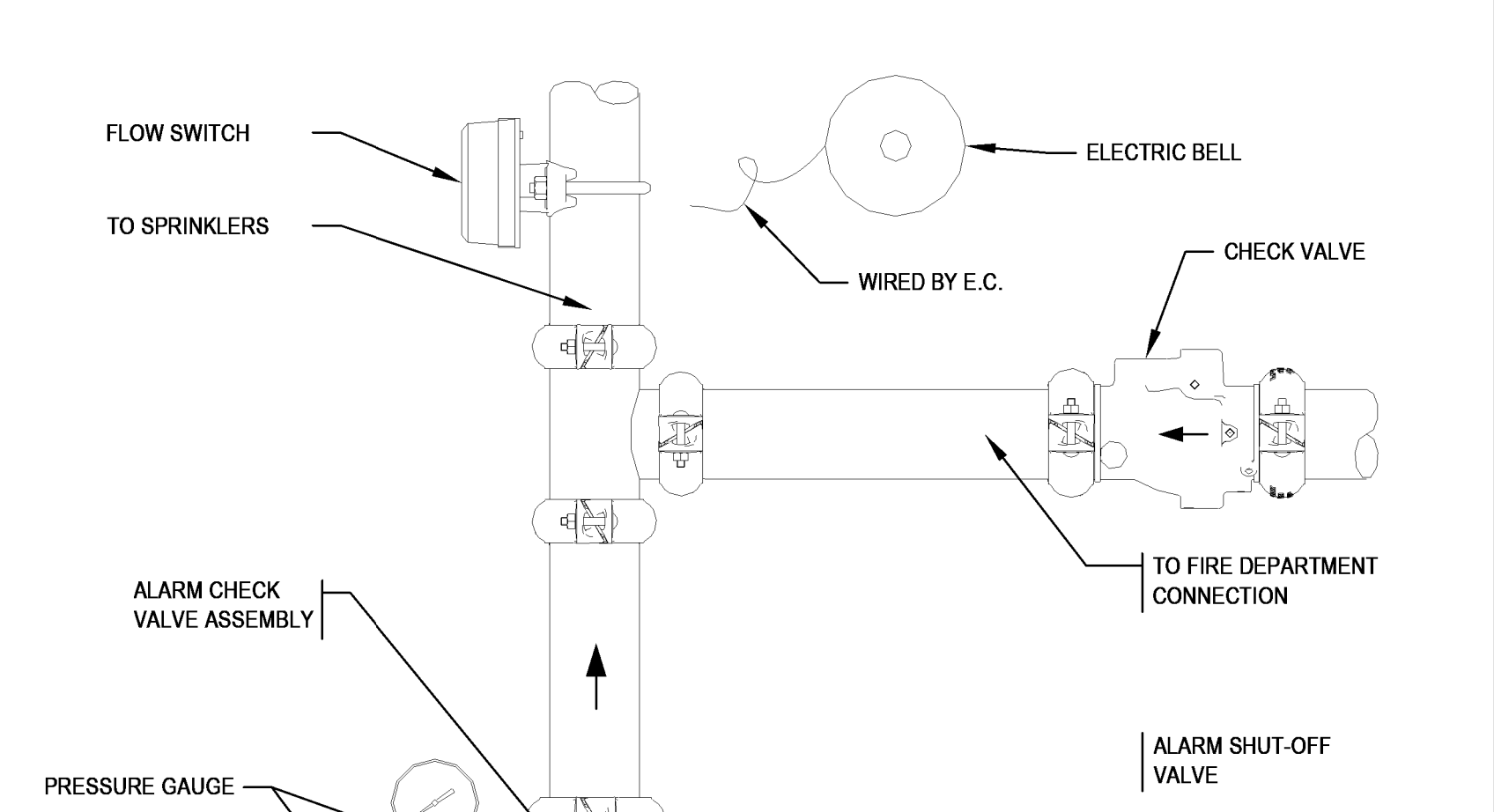
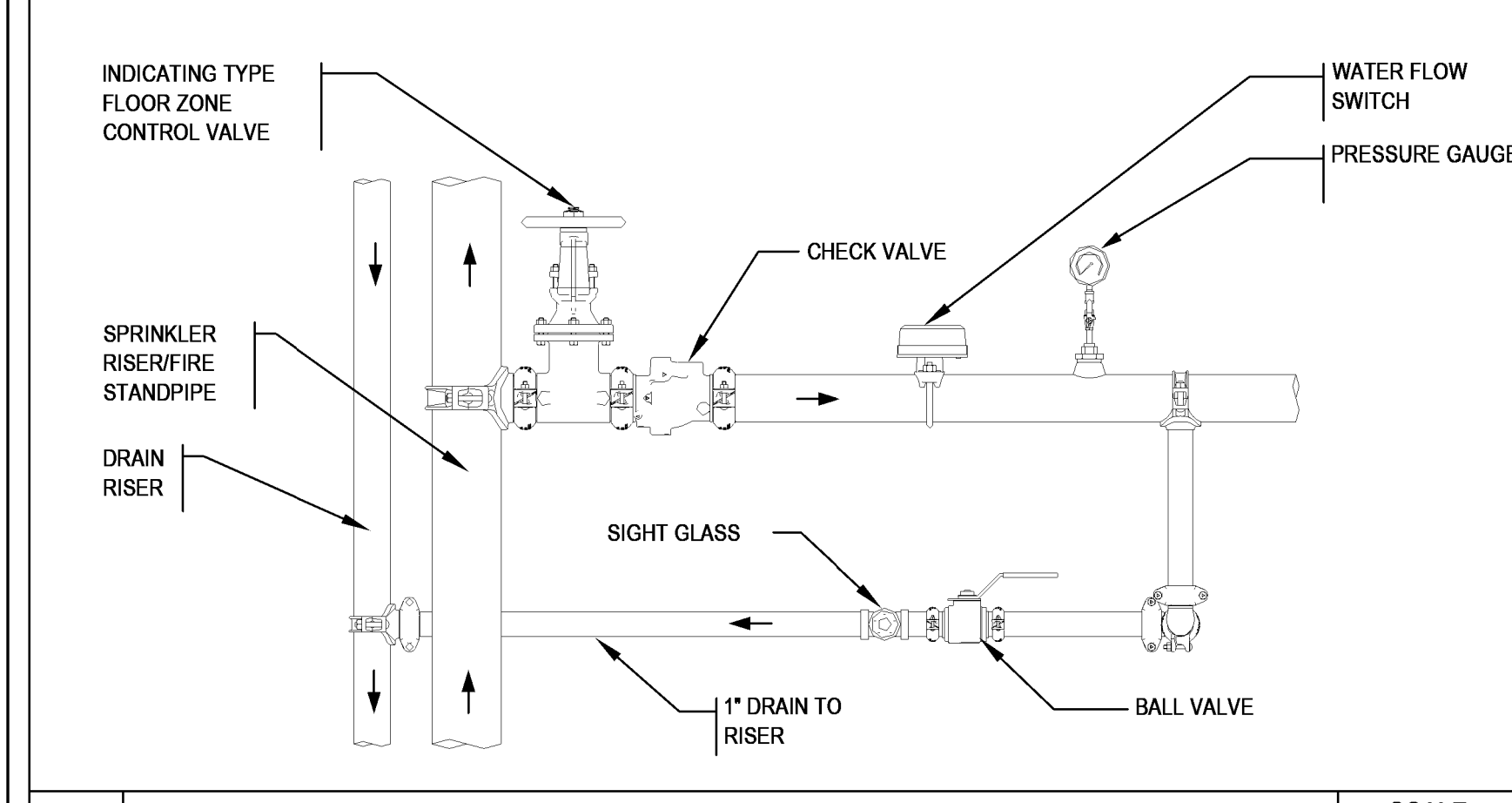
3 SIDE WALL ARM-OVER BRANCH SPRINKLER PIPING SCALE NOT TO SCALE

4 UPRIGHT SPRINKLER HEAD WITH PIPING SCALE NOT TO SCALE



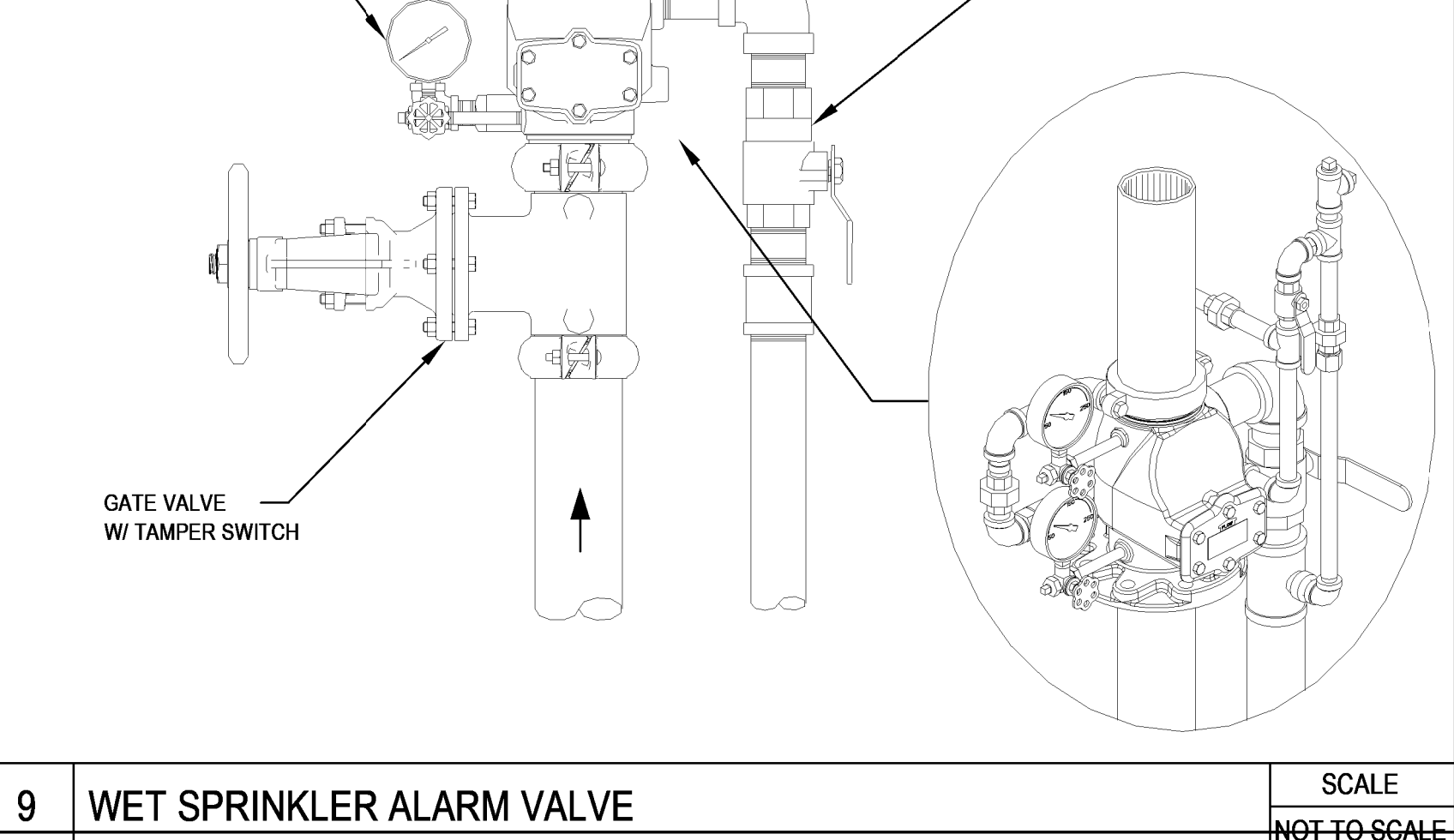
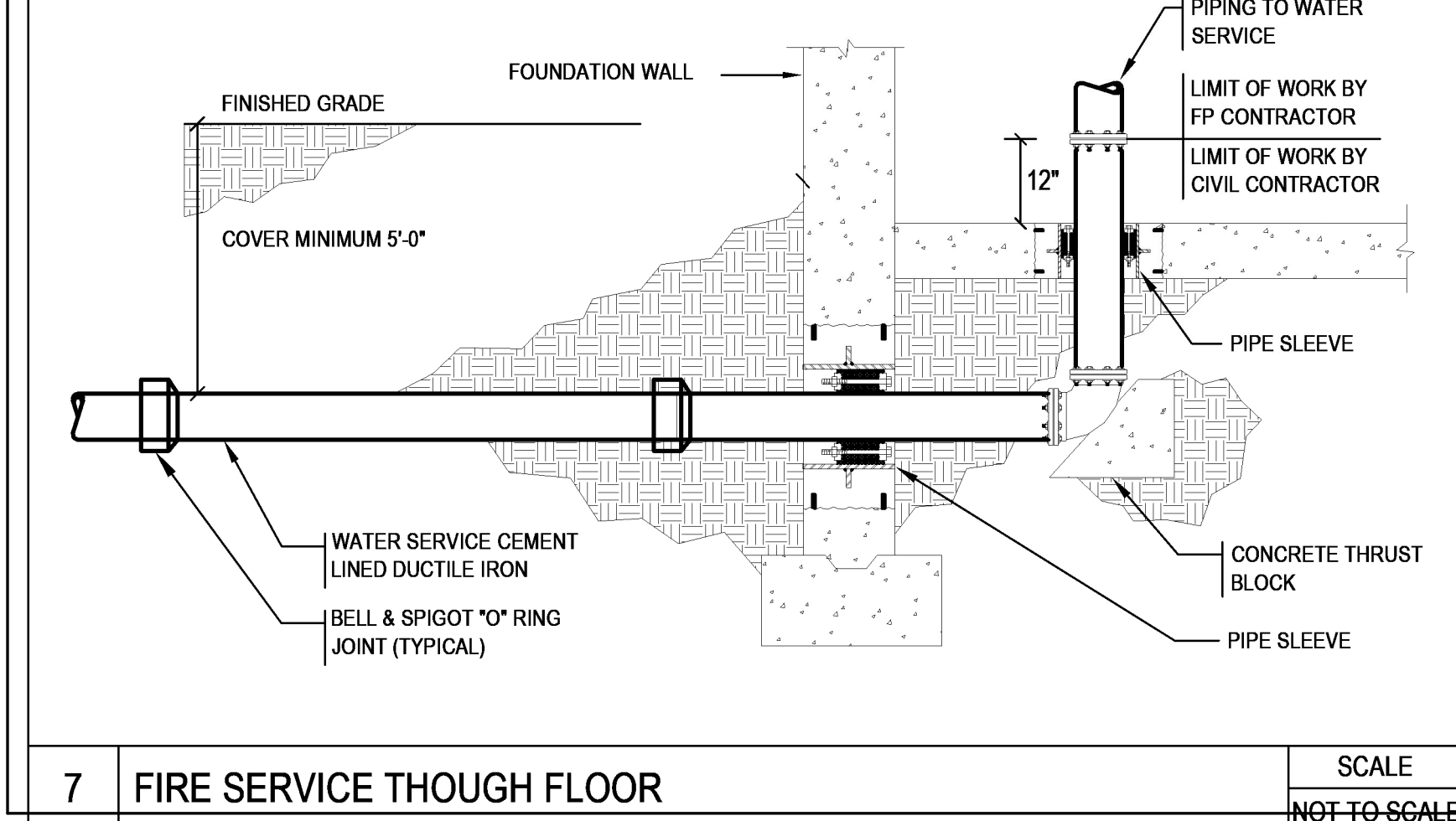
5 DOUBLE CHECK VALVE ASSEMBLY SCALE NOT TO SCALE

8 PIPE HANGERS SCALE NOT TO SCALE



6 SPRINKLER FLOOR CONTROL VALVE ASSEMBLY SCALE NOT TO SCALE

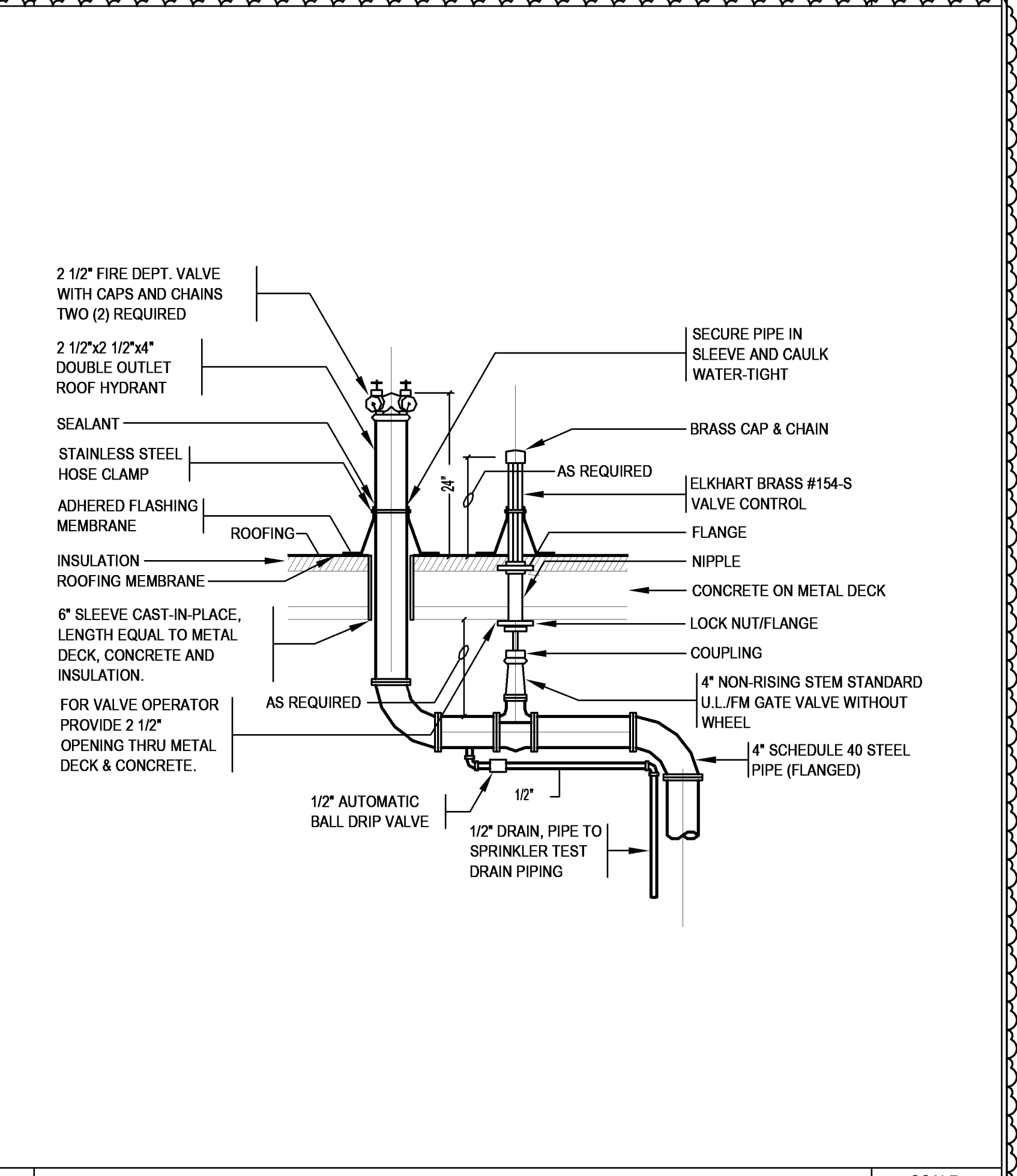
10 CONCEALED SPRINKLER WITH UPRIGHT SPRINKLER SCALE NOT TO SCALE



7 FIRE SERVICE THROUGH FLOOR SCALE NOT TO SCALE

9 WET SPRINKLER ALARM VALVE SCALE NOT TO SCALE

NOTE: DETAIL IS DIAGRAMMATIC FOR INSTALLATION OF SPRINKLER HEAD. STRUCTURE INDICATED IS SHOWN FOR REPRESENTATION OF A STRUCTURE AND MAY VARY. STRUCTURE HAS NO RELEVANCE TO INTENT OF DETAIL.



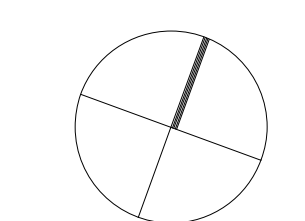
11 ROOF HYDRANT SCALE NOT TO SCALE

KEYNOTE LEGEND:

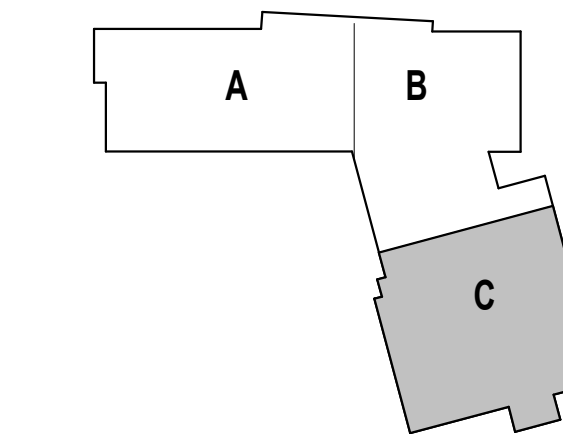
ADD-11 Addendum #11 2/13/24

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



KEYPLAN



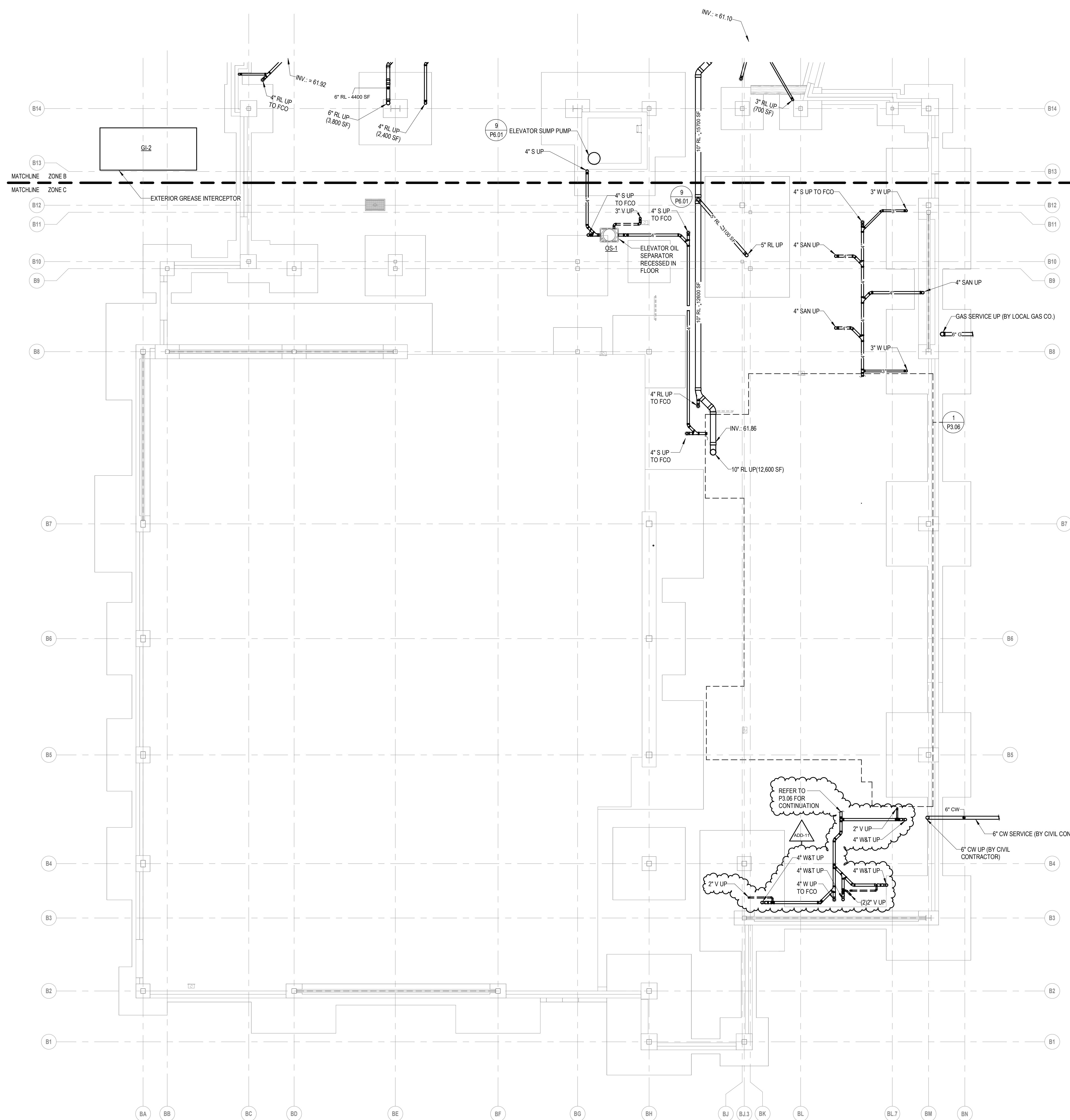
DRAWING NAME:

**PLUMBING
UNDERGROUND
PIPING - ZONE C**

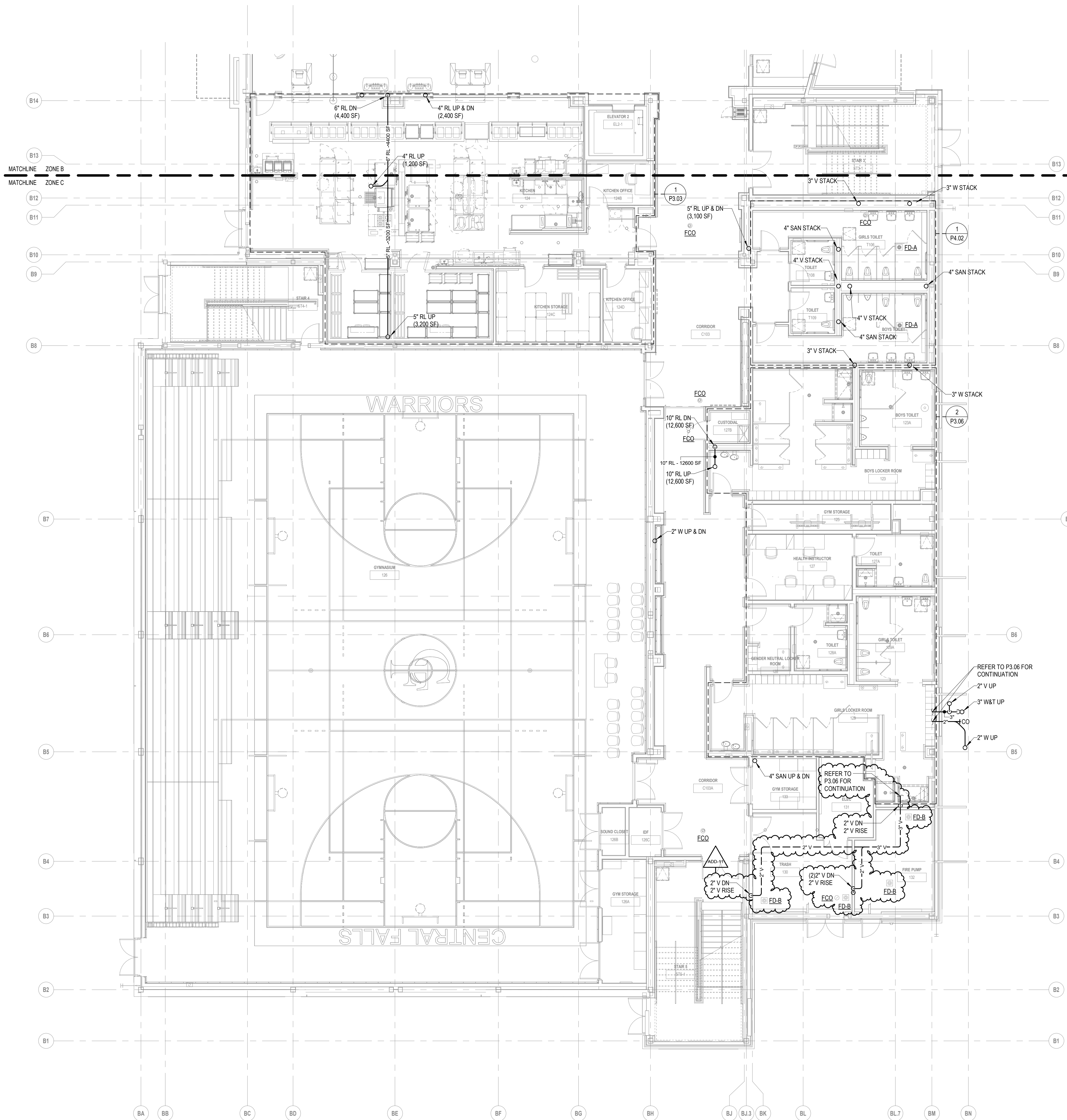
DRAWN BY: EB

REVIEWED BY: AD

SCALE: AS NOTED | DRAWING NUMBER:
JOB NO.: 2202.02 | **P1.10C**
DATE: OCTOBER 13, 2023



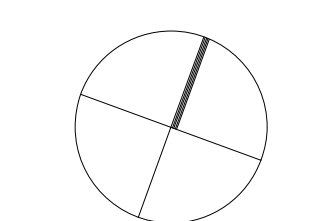
1 UNDERGROUND PIPING PLAN - ZONE C
1/8" = 1'-0"



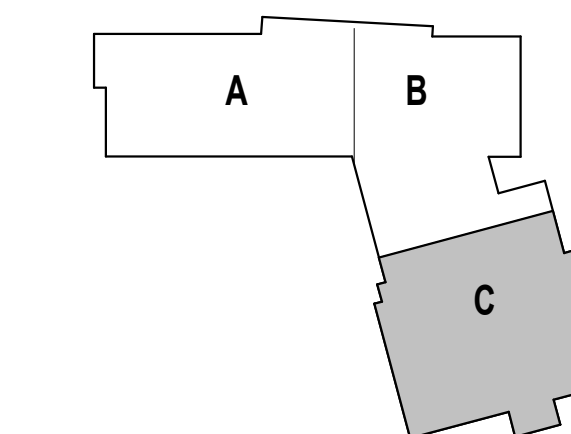
ADD-11 Addendum #11 2/13/24

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



KEYPLAN



DRAWING NAME:

**PLUMBING
FIRST FLOOR
WASTE & VENT
PLAN - ZONE C**

DRAWN BY: EB

REVIEWED BY: AD

SCALE: AS NOTED | DRAWING NUMBER:
JOB NO.: 2202.02
DATE: OCTOBER 13, 2023 **P1.11C**



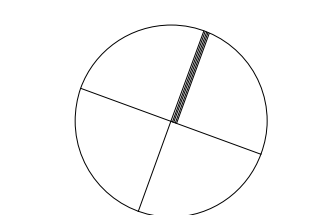
CENTRAL FALLS HIGH SCHOOL
10 HIGGINSON AVE, CENTRAL FALLS, RI

KEYNOTE LEGEND:

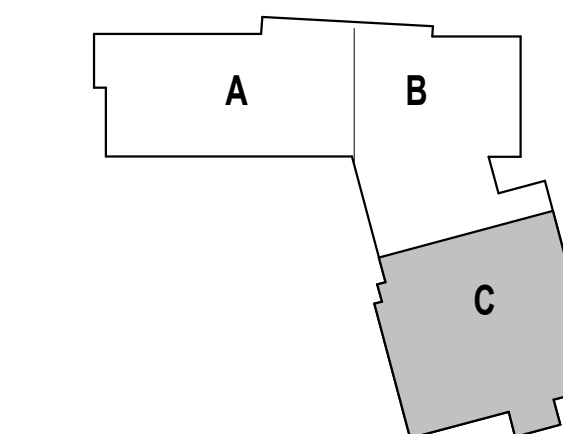
ADD-11 Addendum #11 2/13/24

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



KEYPLAN



DRAWING NAME:

**PLUMBING
FIRST FLOOR
WATER PIPING
PLAN - ZONE C**

DRAWN BY: EB

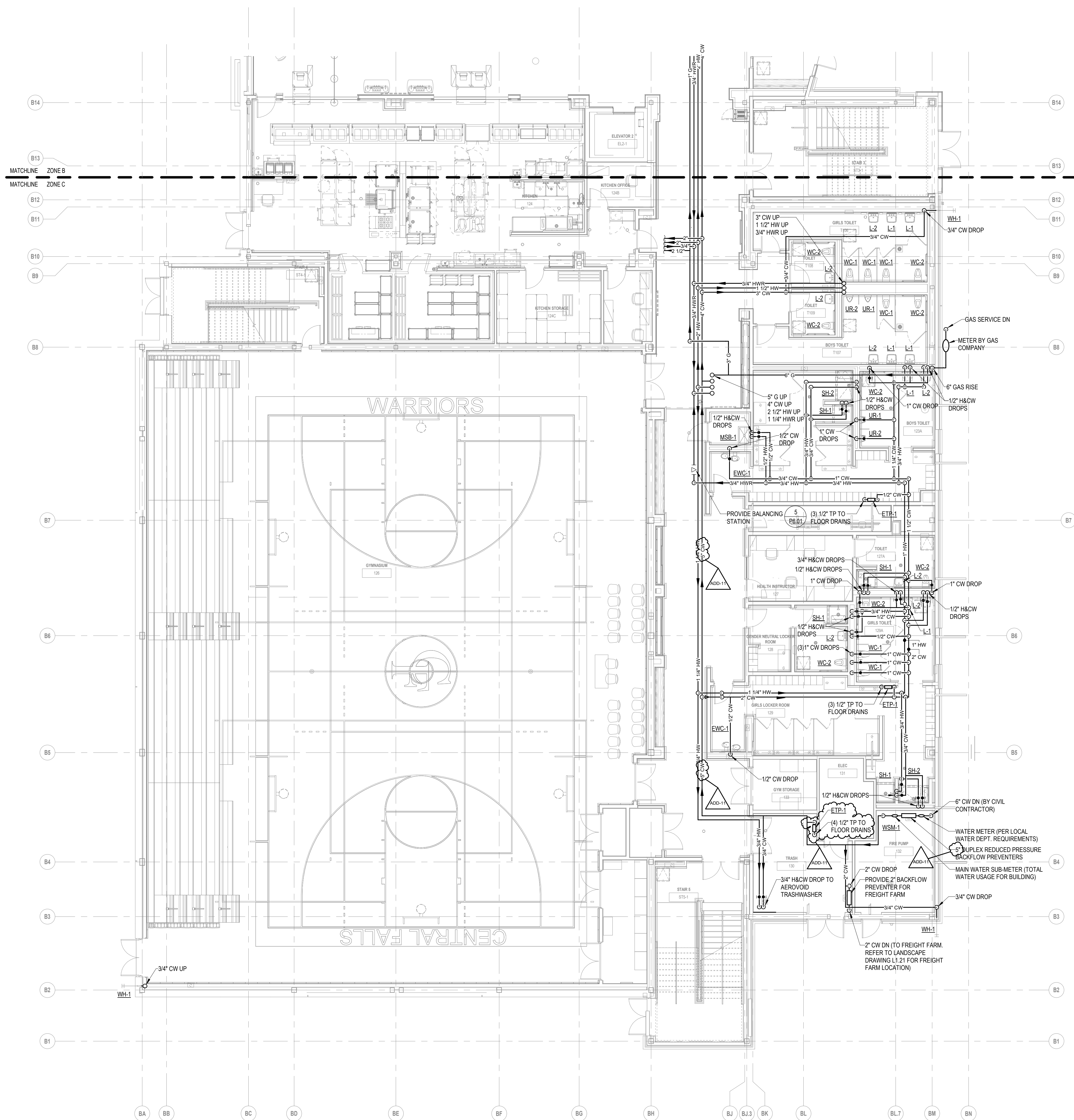
REVIEWED BY: AD

SCALE: AS NOTED | DRAWING NUMBER:

JOB NO.: 2202.02

DATE: OCTOBER 13, 2023

P2.11C



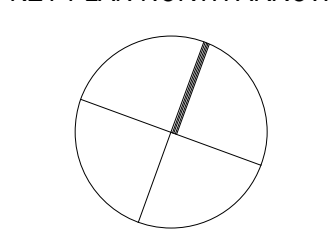
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KEYNOTE LEGEND:

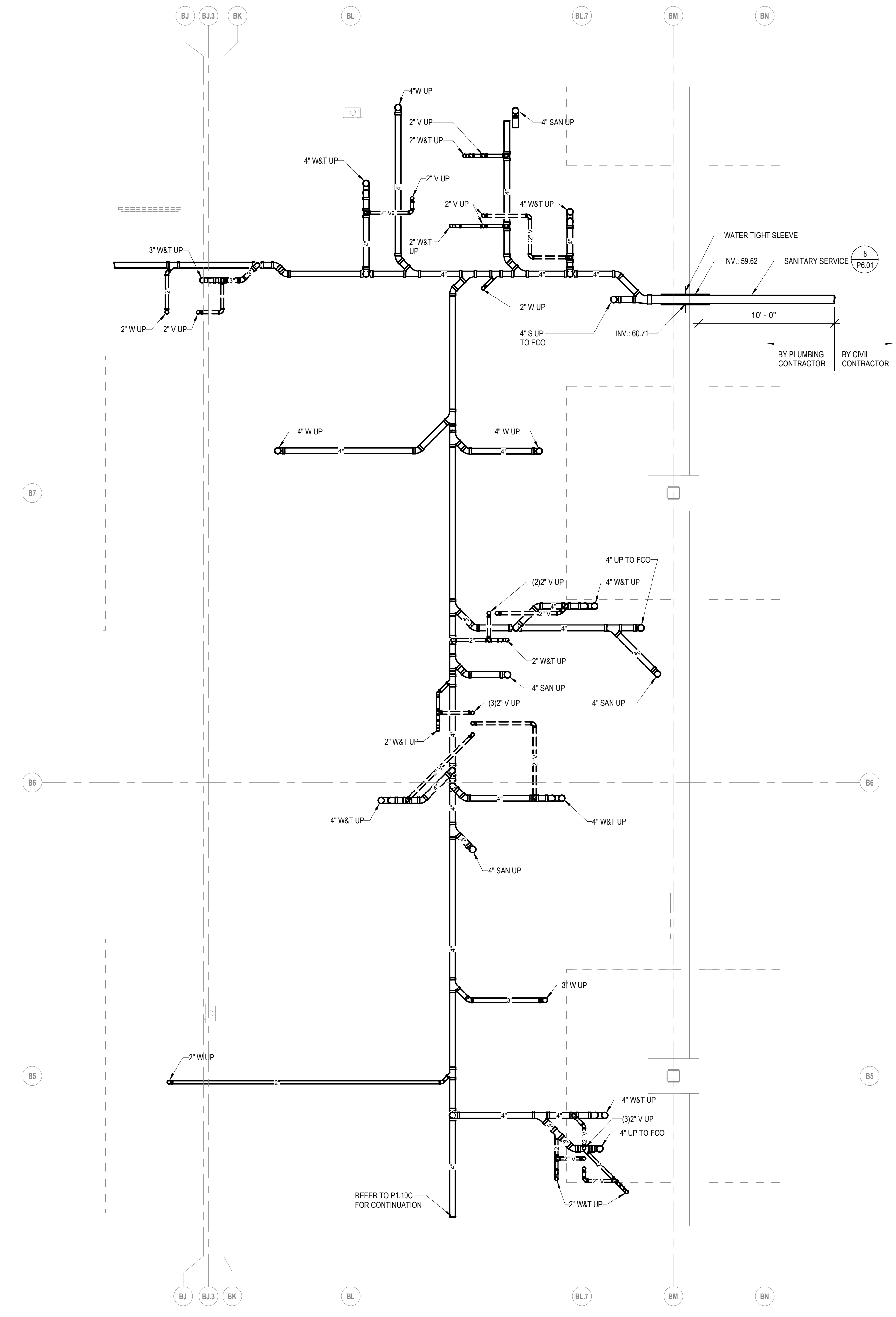
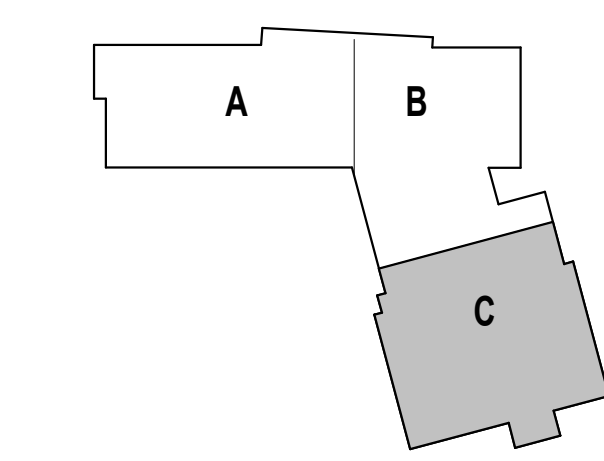
ADD-11 Addendum #11 2/13/24
ADD-3 Addendum #3 1/9/24

100% CONSTRUCTION DOCUMENTS

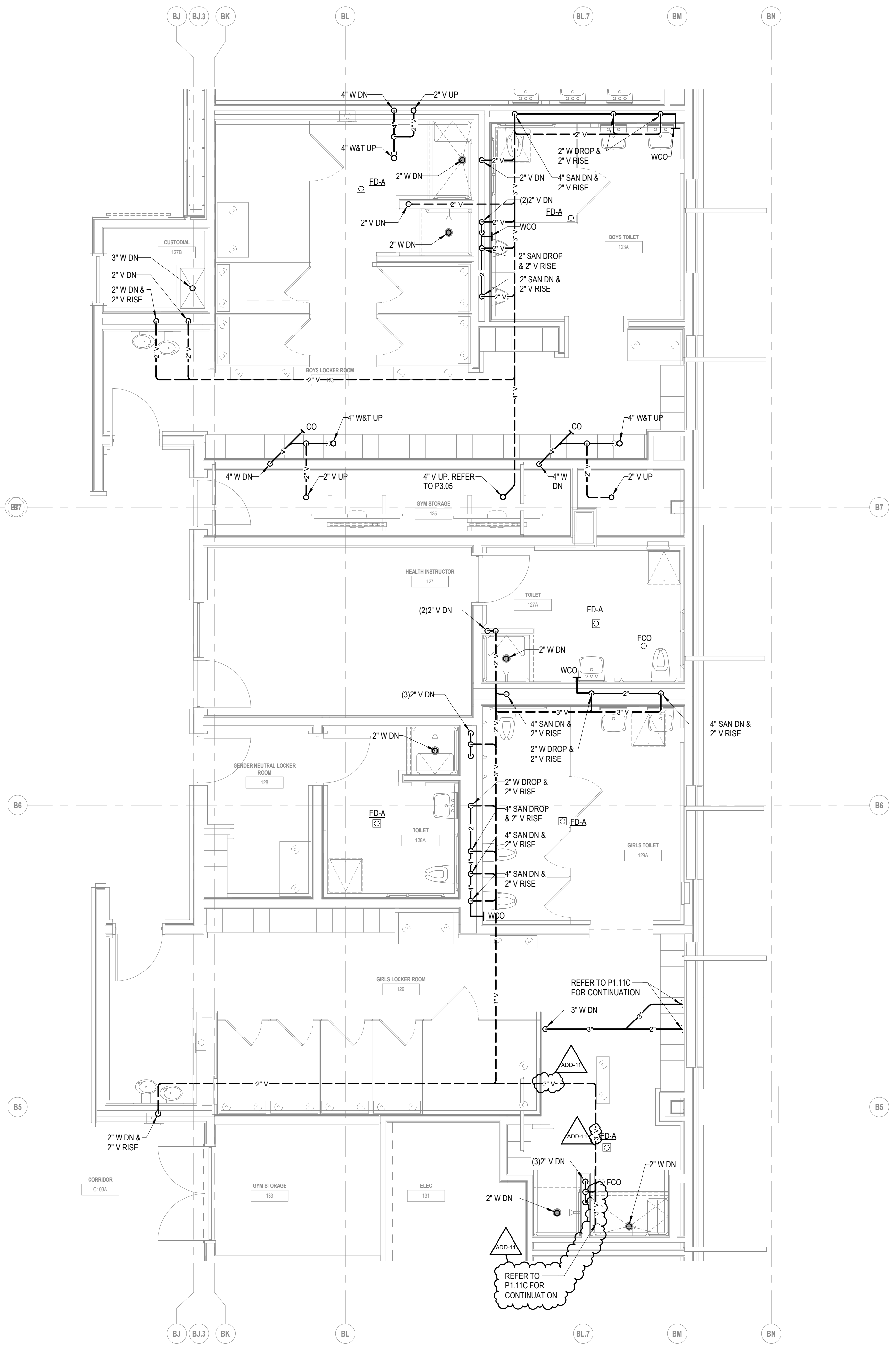
KEY PLAN NORTH ARROW



KEYPLAN

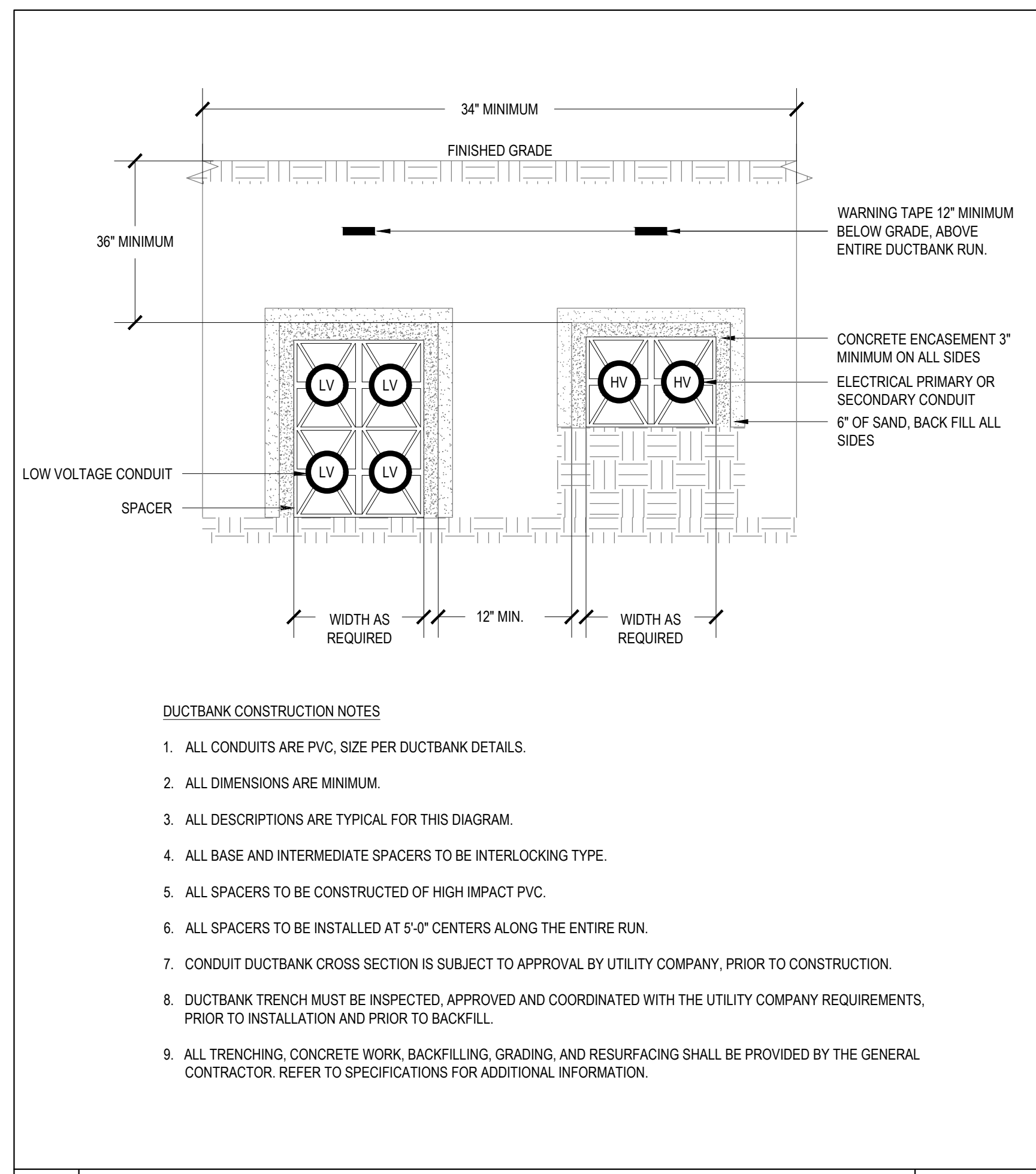


1 ENLARGED UNDERGROUND LOCKER ROOM
Scale: 1/4" = 1'-0"

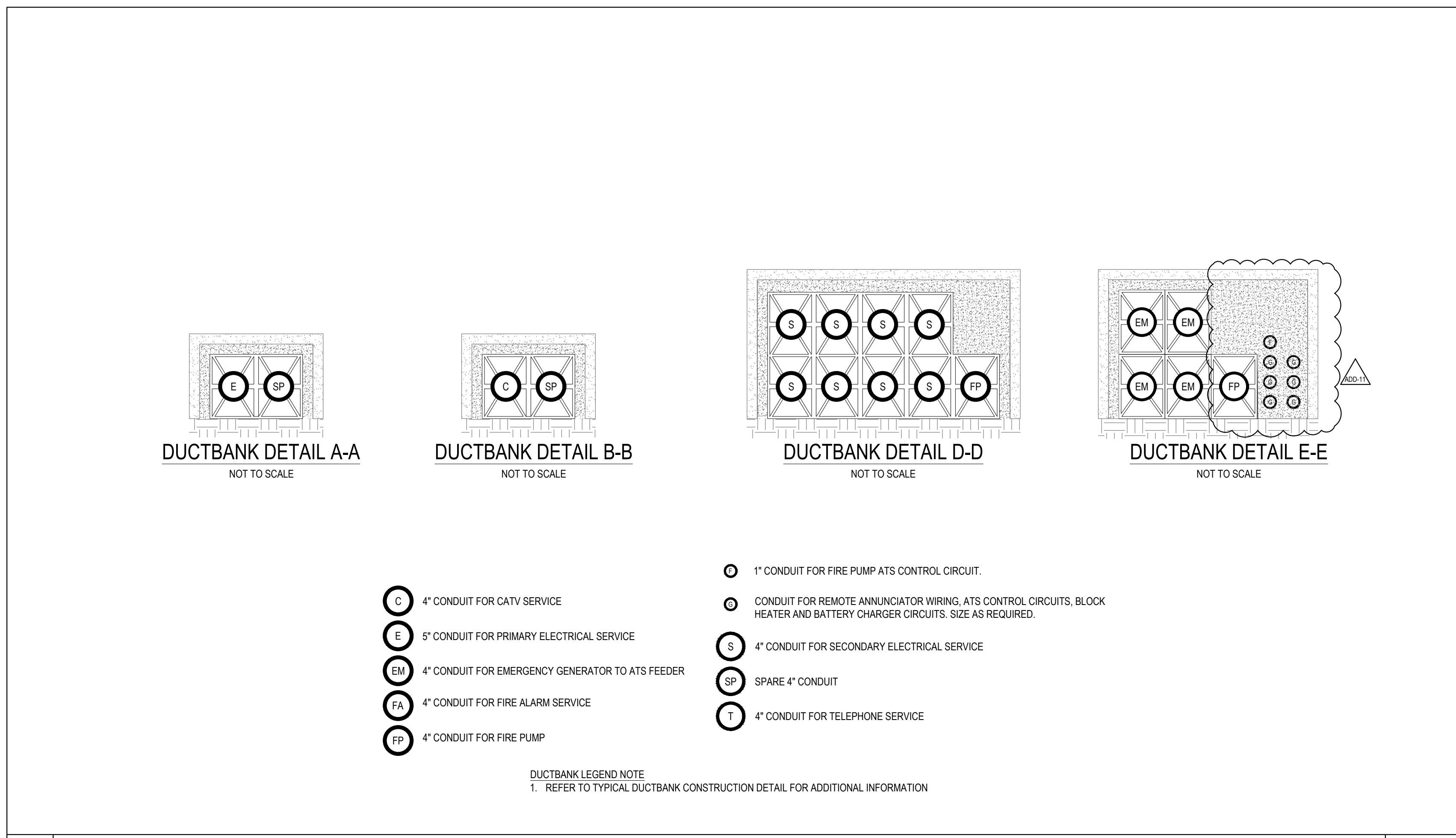


2 ENLARGED FIRST FLOOR LOCKER ROOM
Scale: 1/4" = 1'-0"

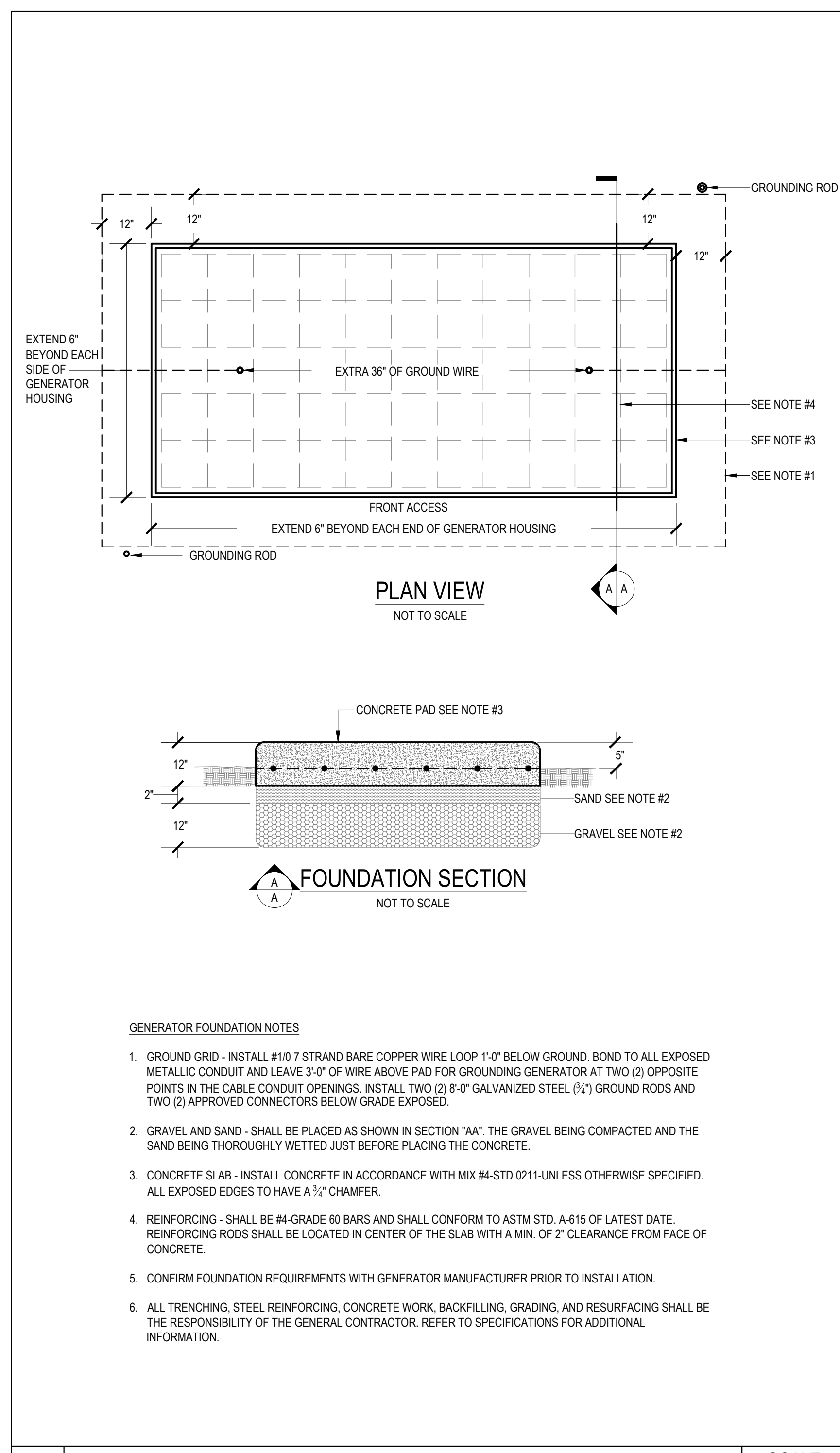
DRAWING NAME:	
PLUMBING ENLARGED LOCKER ROOM FLOOR PLANS	
DRAWN BY:	EB
REVIEWED BY:	AD
SCALE:	AS NOTED DRAWING NUMBER:
JOB NO.:	2202.02
DATE:	OCTOBER 13, 2023
P3.06	



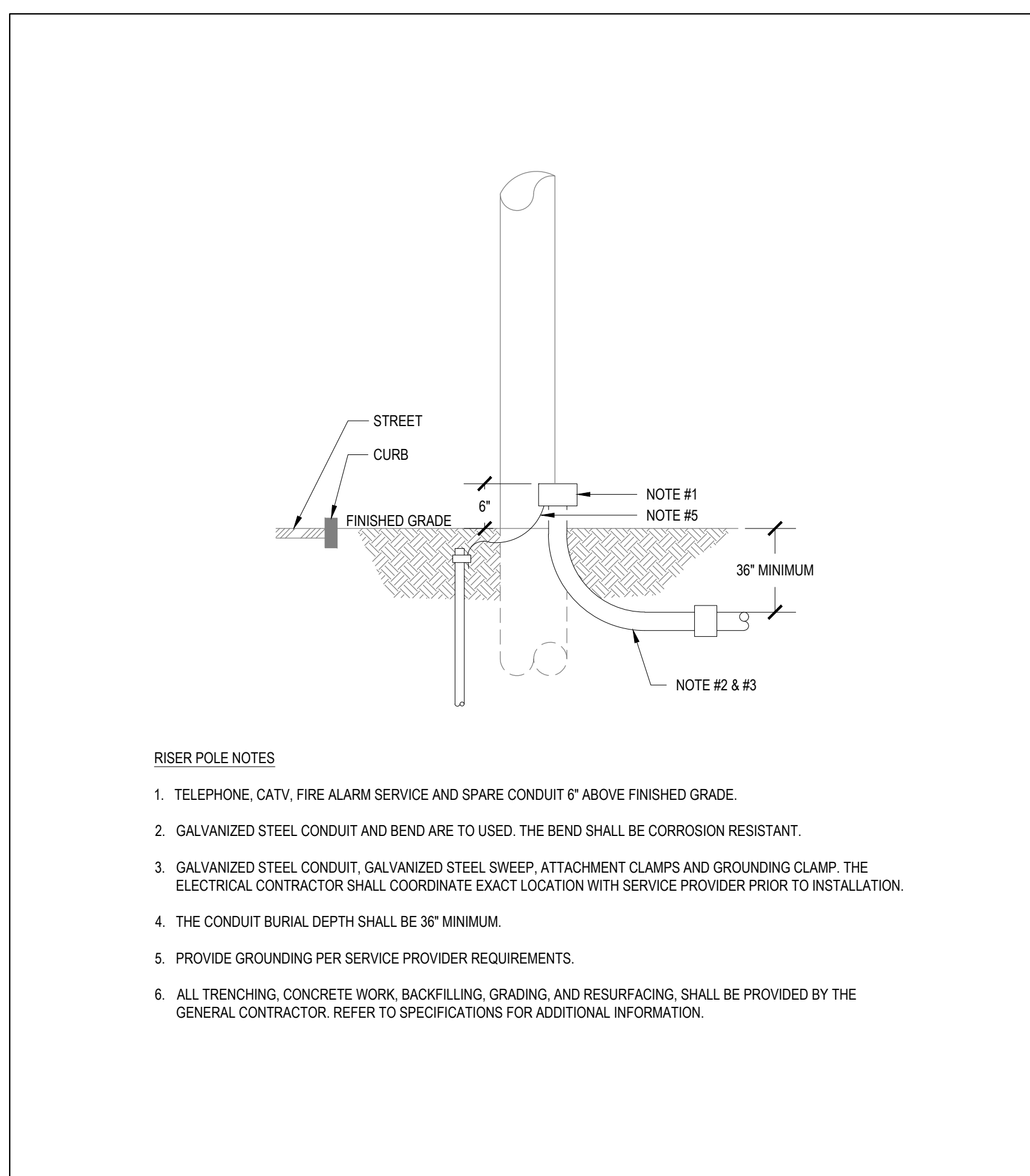
1 TYPICAL DUCTBANK CONSTRUCTION DETAIL SCALE NOT TO SCALE



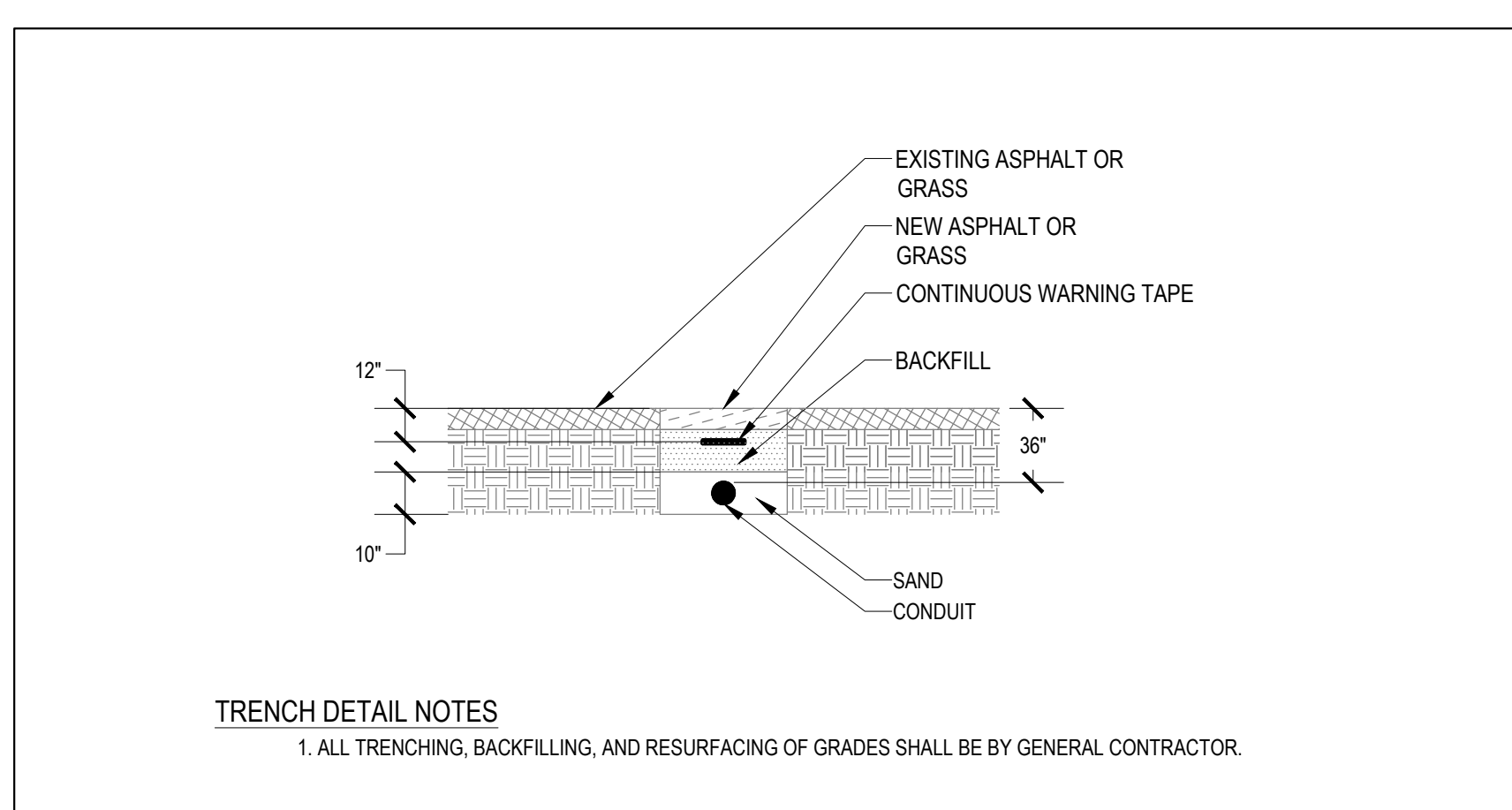
2 DUCTBANK LEGEND DETAIL SCALE NOT TO SCALE



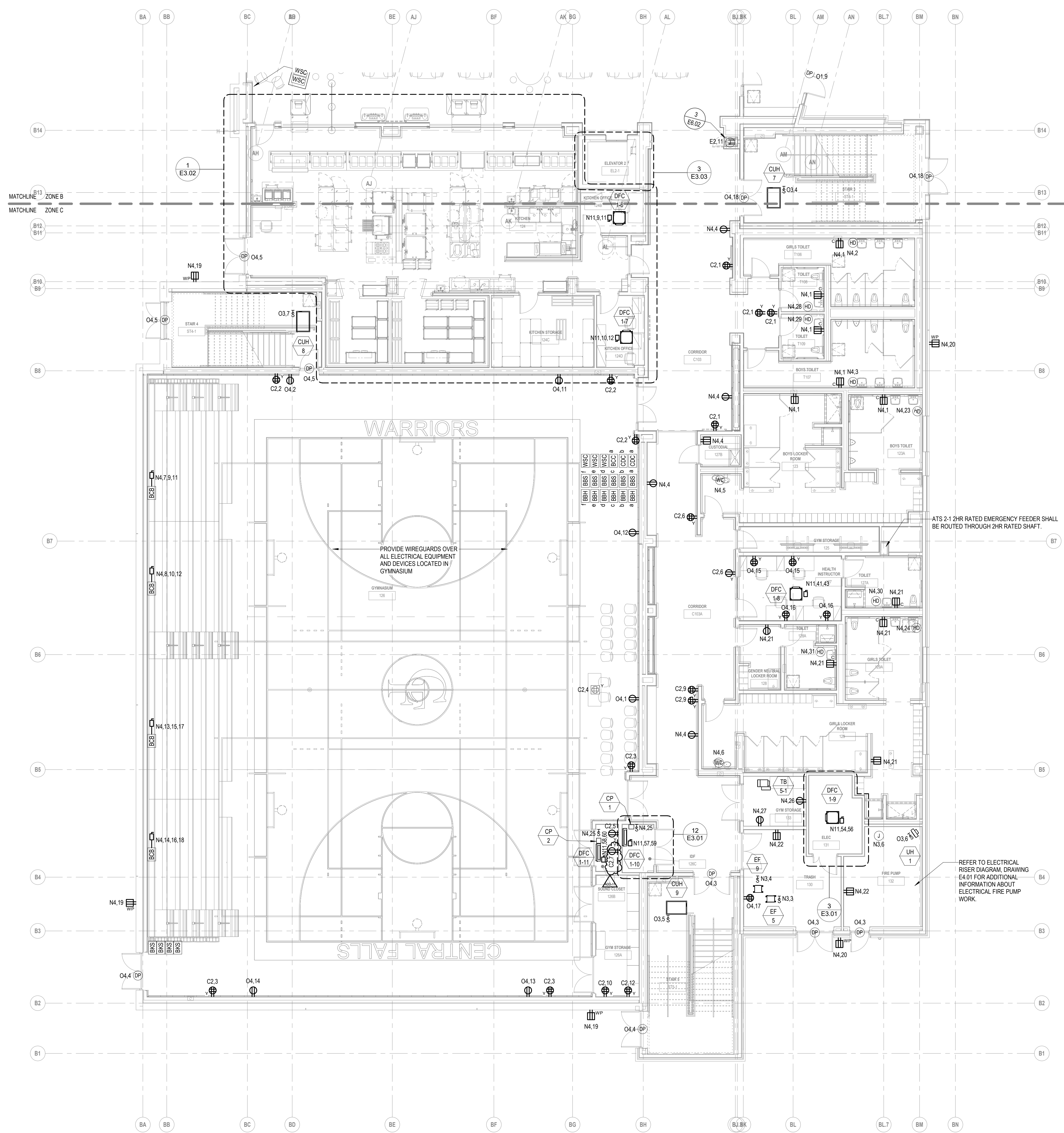
3 GENERATOR FOUNDATION DETAIL SCALE NOT TO SCALE



4 LOW VOLTAGE RISER POLE INSTALLATION DETAIL SCALE NOT TO SCALE



5 TRENCH DETAIL SCALE NOT TO SCALE



277V/480V PANEL KEY SCHEDULE

KEY	PANEL	BRANCH
E1	E1.24	EMERGENCY
N16	LP1A-L	NORMAL
N17	LP2C-L	NORMAL
N18	LP2C-SL	NORMAL
N19	LP2C-M	NORMAL
N20	LP2A-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
O1	CP1A	NORMAL
O2	CP1C	NORMAL
O4	CP2A	NORMAL
O5	CP2C	NORMAL
O6	CP3A	NORMAL
O7	CP3C	NORMAL
O8	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	PP1B	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
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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 CENTRAL FALLS HIGH SCHOOL
 10 HIGGINSON AVE, CENTRAL FALLS, RI

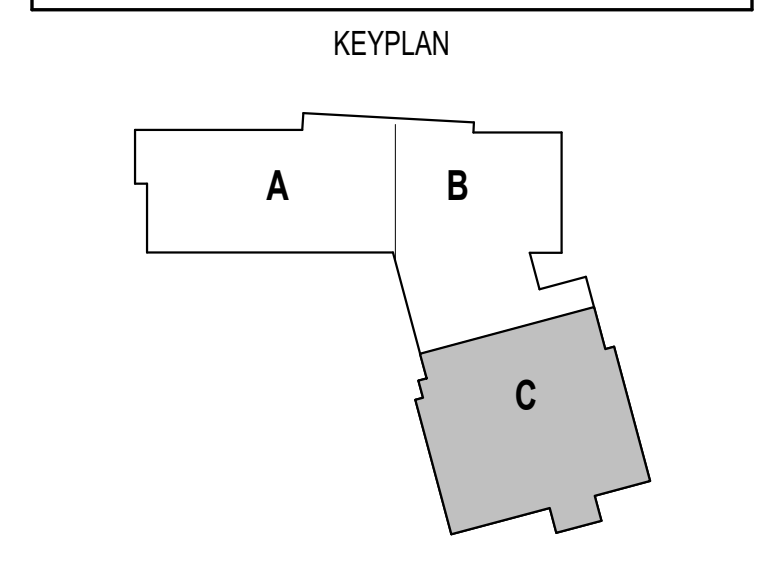
GENERAL NOTES:

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

ADD-11 ADDENDUM 11 2/13/2024
 ADD-9 ADDENDUM 9 2/6/2024
 ADD-8 ADDENDUM 8 1/30/2024
 ADD-7 ADDENDUM 7 1/26/2024

100% CONSTRUCTION DOCUMENTS

KEY PLAN NORTH ARROW



DRAWING NAME:
ELECTRICAL FIRST FLOOR POWER PLAN - ZONE C

DRAWN BY: RBC/UAJ
 REVIEWED BY: RCB

SCALE: AS NOTED | DRAWING NUMBER:
 JOB NO.: 2202.02
 DATE: OCTOBER 13, 2023 **E2.11C**

1 FIRST FLOOR POWER PLAN - ZONE C

PANELBOARD: PP1A-D **400 A 208Y/120, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1,3,5	PP1A-R	300 A	3	60 A	SEE RSR	PP1A-M	2,4,6
7,9,11	PP1A-RBT	100 A	3	1 20 A	--	SPARE	8
13	SPARE	--	20 A	1		SPARE	10
15	SPARE	--	20 A	1		SPARE	12
17	SPARE	--	20 A	1		SPARE	14
19	SPARE	--	20 A	1		SPARE	16
21	SPARE	--	20 A	1		SPARE	18
23	SPARE	--	20 A	1		SPARE	20
25	SPARE	--	20 A	1		SPARE	22
27	SPARE	--	20 A	1		SPARE	24
29	SPARE	--	20 A	1		SPARE	26
31	SPARE	--	20 A	1		SPARE	28
33	SPARE	--	20 A	1		SPARE	30
35	SPARE	--	20 A	1		SPARE	32
37	SPARE	--	20 A	1		SPARE	34
39	SPARE	--	20 A	1		SPARE	36
41	SPARE	--	20 A	1		SPARE	38

PANELBOARD: PP1C-M **N3 60 A 208Y/120, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	TRASH COMPACTOR CONTROLS	12 20 A	1	1 20 A	12	TERMINAL BOXES - ZONE C	2
3	EF-5	1 20 A	1	1 20 A	12	EF-5	4
5	SPARE	--	20 A	1		WATER SUB METER	6
7	SPARE	--	20 A	1		SPARE	8
9	SPARE	--	20 A	1		SPARE	10
11	SPARE	--	20 A	1		SPARE	12
13	SPARE	--	20 A	1		SPARE	14
15	SPARE	--	20 A	1		SPARE	16
17	SPARE	--	20 A	1		SPARE	18
19	SPARE	--	20 A	1		SPARE	20
21	SPARE	--	20 A	1		SPARE	22
23	SPARE	--	20 A	1		SPARE	24
25	SPARE	--	20 A	1		SPARE	26
27	SPARE	--	20 A	1		SPARE	28
29	SPARE	--	20 A	1		SPARE	30
31	SPARE	--	20 A	1		SPARE	32
33	SPARE	--	20 A	1		SPARE	34
35	SPARE	--	20 A	1		SPARE	36
37	SPARE	--	20 A	1		SPARE	38
39	SPARE	--	20 A	1		SPARE	40
41	SPARE	--	20 A	1		SPARE	42

PANELBOARD: OP1C-M **O3 60 A 208Y/120, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	ELEV 2 SHAFT LIGHTING	10 20 A	1	1 20 A	10	ELEV 2 PIT SUMP PUMP	2
3	ELEV 2 PIT RECEPT	10 20 A	1	1 20 A	12	CUH-1	4
5	CUH-1	12 20 A	1	1 20 A	12	UH-1	6
7	CUH-1	12 20 A	1	1 20 A	10	OIL INTERCEPTOR CNTL PNL	8
9	SPARE	--	20 A	1		SPARE	10
11	SPARE	--	20 A	1		SPARE	12
13	SPARE	--	20 A	1		SPARE	14
15	SPARE	--	20 A	1		SPARE	16
17	SPARE	--	20 A	1		SPARE	18
19	SPARE	--	20 A	1		SPARE	20
21	SPARE	--	20 A	1		SPARE	22
23	SPARE	--	20 A	1		SPARE	24
25	SPARE	--	20 A	1		SPARE	26
27	SPARE	--	20 A	1		SPARE	28
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33	SPARE	--	20 A	1		SPARE	34
35	SPARE	--	20 A	1		SPARE	36
37	SPARE	--	20 A	1		SPARE	38
39	SPARE	--	20 A	1		SPARE	40
41	SPARE	--	20 A	1		SPARE	42

PANELBOARD: LP1A-L **N16 60 A 277Y/480V, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	LIGHTING	12 20 A	1	1 20 A	12	LIGHTING	2
3	LIGHTING	12 20 A	1	1 20 A	12	LIGHTING	4
5	LIGHTING	12 20 A	1	1 20 A	12	LIGHTING	6
7	LIGHTING	12 20 A	1	1 20 A	12	LIGHTING	8
9	SPARE	--	20 A	1		SPARE	10
11	SPARE	--	20 A	1		SPARE	12
13	SPARE	--	20 A	1		SPARE	14
15	SPARE	--	20 A	1		SPARE	16
17	SPARE	--	20 A	1		SPARE	18
19	SPARE	--	20 A	1		SPARE	20
21	SPARE	--	20 A	1		SPARE	22
23	SPARE	--	20 A	1		SPARE	24
25	SPARE	--	20 A	1		SPARE	26
27	SPARE	--	20 A	1		SPARE	28
29	SPARE	--	20 A	1		SPARE	30
31	SPARE	--	20 A	1		SPARE	32
33	SPARE	--	20 A	1		SPARE	34
35	SPARE	--	20 A	1		SPARE	36
37	SPARE	--	20 A	1		SPARE	38
39	SPARE	--	20 A	1		SPARE	40
41	SPARE	--	20 A	1		SPARE	42

PANELBOARD: PP1C-R **N4 150 A 208Y/120, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.	
1	RECEPTACLES	10 20 A	1	1 20 A	9	HAND DRYER	2	
3	HAND DRYER	1 20 A	8	1 20 A	8	RECEPTACLES	4	
5	WATER COOLER	1 20 A	12	1 20 A	12	WATER COOLER	6	
7,9,11	GYM BLEACHERS	10 20 A	3	3 20 A	10	GYM BLEACHERS	8,10,12	
13,15,17	GYM BLEACHERS	12 20 A	3	3 20 A	12	GYM BLEACHERS	14,16,18	
19	EXTERIOR RECEPTACLES	10 20 A	1	1 20 A	10	EXTERIOR RECEPTACLES	20	
21	RECEPTACLES	12 20 A	1	1 20 A	12	RECEPTACLES	22	
23	HAND DRYER	10 20 A	1	1 20 A	10	HAND DRYER	24	
25	CP-1 (2)	12 20 A	1	1 20 A	12	RECEPTACLES	26	
27	RECEPTACLES	12 20 A	1	1 20 A	8	G	HAND DRYER	28
29	HAND DRYER	8 20 A	1	1 20 A	10	G	HAND DRYER	30
31	HAND DRYER	12 20 A	1	1 20 A	--		SPARE	32
33	SPARE	--	20 A	1			SPARE	34
35	SPARE	--	20 A	1			SPARE	36
37	SPARE	--	20 A	1			SPARE	38
39	SPARE	--	20 A	1			SPARE	40
41	SPARE	--	20 A	1			SPARE	42
43	SPARE	--	20 A	1			SPARE	44
45	SPARE	--	20 A	1			SPARE	46
47	SPARE	--	20 A	1			SPARE	48
49	SPARE	--	20 A	1			SPARE	50
51	SPARE	--	20 A	1			SPARE	52
53	SPARE	--	20 A	1			SPARE	54
55	SPARE	--	20 A	1			SPARE	56
57	SPARE	--	20 A	1			SPARE	58
59	SPARE	--	20 A	1			SPARE	60
61	SPARE	--	20 A	1			SPARE	62
63	SPARE	--	20 A	1			SPARE	64
65	SPARE	--	20 A	1			SPARE	66
67	SPARE	--	20 A	1			SPARE	68
69	SPARE	--	20 A	1			SPARE	70
71	SPARE	--	20 A	1			SPARE	72
73	SPARE	--	20 A	1			SPARE	74
75	SPARE	--	20 A	1			SPARE	76
77	SPARE	--	20 A	1			SPARE	78
79	SPARE	--	20 A	1			SPARE	80
81	SPARE	--	20 A	1			SPARE	82
83	SPARE	--	20 A	1			SPARE	84

PANELBOARD: OL1A-L **O18 60 A 277Y/480V, 3PH, 4W, 60HZ**

SHUNT TRIP MAIN	LC = VIA LIGHTING CONTROL PANEL	GENERAL NOTES:
SINGLE TUB PANEL	IG = ISOLATED GROUND	2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
FEED THRU LUGS	P = GFPE - 30mA TRIP	3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND U.O.N.
100% RATED MAIN BREAKER	G = GFCEI - 5mA TRIP	4. WIRE SIZES AS SHOWN ON PANEL
GROUND FAULT MAIN C.B.	S = SHUNT TRIP	
COMPUTER PANEL	A = ARC FAULT CIRCUIT BREAKER	
SURGE PROTECTION DEVICE	4 = 4W + G	

CKT. NO.	LOAD DESCRIPTION	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	LIGHTING	12 20 A	1	1 20 A	12	LIGHTING	2

PANELBOARD: OP2C-R O8 60 A 208Y/120, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 100 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	ATHLETIC DIRECTORS RECEPT	12	20 A	1				DOOR POWER	2
3	GEN. BATTERY CHARGER	6	20 A	1				RECEPTACLES	4
5,7	GEN. JACKET WATER BLOCK HEATER	3	30 A	2				RECEPTACLES	6
9	SPARE		20 A	1				SPARE	8
11	SPARE		20 A	1				SPARE	10
13	SPARE		20 A	1				SPARE	12
15	SPARE		20 A	1				SPARE	14
17	SPARE		20 A	1				SPARE	16
19	SPARE		20 A	1				SPARE	18
21	SPARE		20 A	1				SPARE	20
23	SPARE		20 A	1				SPARE	22
25	SPARE		20 A	1				SPARE	24
27	SPARE		20 A	1				SPARE	26
29	SPARE		20 A	1				SPARE	28
31	SPARE		20 A	1				SPARE	30
33	SPARE		20 A	1				SPARE	32
35	SPARE		20 A	1				SPARE	34
37	SPARE		20 A	1				SPARE	36
39	SPARE		20 A	1				SPARE	38
41	SPARE		20 A	1	3	40 A	SEE ZHF SCH	ZHFOP2C	38,40,42

PANELBOARD: CP2C C5 100 A 208Y/120, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 100 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	RECEPTACLES		20 A	1				RECEPTACLES	2
3	RECEPTACLES		20 A	1				RECEPTACLES	4
5	RECEPTACLES		20 A	1				RECEPTACLES	6
7	RECEPTACLES		20 A	1				RECEPTACLES	8
9	RECEPTACLES		20 A	1				RECEPTACLES	10
11	RECEPTACLES		20 A	1				RECEPTACLES	12
13	SPARE		20 A	1				SPARE	14
15	SPARE		20 A	1				SPARE	16
17	SPARE		20 A	1				SPARE	18
19	SPARE		20 A	1				SPARE	20
21	SPARE		20 A	1				SPARE	22
23	SPARE		20 A	1				SPARE	24
25	SPARE		20 A	1				SPARE	26
27	SPARE		20 A	1				SPARE	28
29	SPARE		20 A	1				SPARE	30
31	SPARE		20 A	1				SPARE	32
33	SPARE		20 A	1				SPARE	34
35	SPARE		20 A	1				SPARE	36
37	SPARE		20 A	1				SPARE	38
39	SPARE		20 A	1	3	40 A	SEE ZHF SCH	ZHFC2C	38,40,42
41	SPARE		20 A	1				SPARE	42

PANELBOARD: LP2C-L N17 60 A 277Y/480V, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 100 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	LIGHTING		20 A	1				LIGHTING	2
3	LIGHTING	LC	20 A	1				LIGHTING	4
5	LIGHTING		20 A	1				LIGHTING	6
7	LIGHTING		20 A	1				LIGHTING	8
9	SPARE		20 A	1				SPARE	10
11	SPARE		20 A	1				SPARE	12
13	SPARE		20 A	1				SPARE	14
15	SPARE		20 A	1				SPARE	16
17	SPARE		20 A	1				SPARE	18
19	SPARE		20 A	1				SPARE	20
21	SPARE		20 A	1				SPARE	22
23	SPARE		20 A	1				SPARE	24
25	SPARE		20 A	1				SPARE	26
27	SPARE		20 A	1				SPARE	28
29	SPARE		20 A	1				SPARE	30
31	SPARE		20 A	1				SPARE	32
33	SPARE		20 A	1				SPARE	34
35	SPARE		20 A	1				SPARE	36
37	SPARE		20 A	1				SPARE	38
39	SPARE		20 A	1				SPARE	40
41	SPARE		20 A	1				SPARE	42

PANELBOARD: LP2C-SL N18 60 A 277Y/480V, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 100 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	SITE LIGHTING	LC	20 A	1				SITE LIGHTING	2
3	SITE LIGHTING	LC	20 A	1				SITE LIGHTING	4
5	SITE LIGHTING	LC	20 A	1				SITE LIGHTING	6
7	SITE LIGHTING	LC	20 A	1				FLAG POLE LIGHTING	8
9	SITE LIGHTING	LC	20 A	1				SPARE	10
11	SPARE		20 A	1				SPARE	12
13	SPARE		20 A	1				SPARE	14
15	SPARE		20 A	1				SPARE	16
17	SPARE		20 A	1				SPARE	18
19	SPARE		20 A	1				SPARE	20
21	SPARE		20 A	1				SPARE	22
23	SPARE		20 A	1				SPARE	24
25	SPARE		20 A	1				SPARE	26
27	SPARE		20 A	1				SPARE	28
29	SPARE		20 A	1				SPARE	30
31	SPARE		20 A	1				SPARE	32
33	SPARE		20 A	1				SPARE	34
35	SPARE		20 A	1				SPARE	36
37	SPARE		20 A	1				SPARE	38
39	SPARE		20 A	1				SPARE	40
41	SPARE		20 A	1				SPARE	42

PANELBOARD: LP2C-M N19 200 A 277Y/480V, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 225 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1,3,5	WAREWASHER		90 A	3				TRASH COMPACTOR	2,4,6
7,9,11	ERV-1		20 A	3				NPWH-1	8,10,12
13	SPARE		20 A	1				SPARE	14
15	SPARE		20 A	1				SPARE	16
17	SPARE		20 A	1				SPARE	18
19	SPARE		20 A	1				SPARE	20
21	SPARE		20 A	1				SPARE	22
23	SPARE		20 A	1				SPARE	24
25	SPARE		20 A	1				SPARE	26
27	SPARE		20 A	1				SPARE	28
29	SPARE		20 A	1				SPARE	30
31	SPARE		20 A	1				SPARE	32
33	SPARE		20 A	1				SPARE	34
35	SPARE		20 A	1				SPARE	36
37	SPARE		20 A	1				SPARE	38
39	SPARE		20 A	1				SPARE	40
41	SPARE		20 A	1				SPARE	42

PANELBOARD: OL2C-L O20 60 A 277Y/480V, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 100 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1	LIGHTING		20 A	1				LIGHTING	2
3	LIGHTING		20 A	1				LIGHTING	4
5	LIGHTING		20 A	1				LIGHTING	6
7	SPARE		20 A	1				SPARE	8
9	SPARE		20 A	1				SPARE	10
11	SPARE		20 A	1				SPARE	12
13	SPARE		20 A	1				SPARE	14
15	SPARE		20 A	1				SPARE	16
17	SPARE		20 A	1				SPARE	18
19	SPARE		20 A	1				SPARE	20
21	SPARE		20 A	1				SPARE	22
23	SPARE		20 A	1				SPARE	24
25	SPARE		20 A	1				SPARE	26
27	SPARE		20 A	1				SPARE	28
29	SPARE		20 A	1				SPARE	30
31	SPARE		20 A	1				SPARE	32
33	SPARE		20 A	1				SPARE	34
35	SPARE		20 A	1				SPARE	36
37	SPARE		20 A	1				SPARE	38
39	SPARE		20 A	1				SPARE	40
41	SPARE		20 A	1				SPARE	42

PANELBOARD: OL2C-M O19 300 A 277Y/480V, 3PH, 4W, 60HZ									
MAINS TYPE: MAIN CIRCUIT BREAKER MOUNTING: SURFACE MOUNTED				SHUNT TRIP MAIN 200% RATED NEUTRAL SINGLE TUB PANEL FEED THRU LUGS 100% RATED MAIN BREAKER GROUND FAULT MAIN C.B. COMPUTER PANEL SURGE PROTECTION DEVICE		LC = VIA LIGHTING CONTROL PANEL L = PROVIDE LOCK ON CB IG = ISOLATED GROUND P = GFPE - 30mA TRIP G = GFCCI - 5mA TRIP S = SHUNT TRIP A = ARC FAULT CIRCUIT BREAKER 4 = 4W + G		GENERAL NOTES: 1. FOR SINGLE POLE CIRCUIT BREAKERS, PROVIDE 2 WIRES + GROUND U.O.N. 2. FOR TWO POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 3. FOR THREE POLE CIRCUIT BREAKERS, PROVIDE 3 WIRES + GROUND, U.O.N. 4. WIRE SIZES AS SHOWN ON PANEL.	
AIC: 65k BUS AMPS RATING: 400 A									
CKT. NO.	LOAD DESCRIPTION	NOTE	WIRE SIZE	CIRCUIT BREAKER	CIRCUIT BREAKER	WIRE SIZE	NOTE	LOAD DESCRIPTION	CKT. NO.
1,3,5	PUMP P-1 VIA VFD-1	10	30 A	3				PUMP P-2 VIA VFD-2	2,4,6
7,9,11	BOILER PUMP BP-1	12	20 A	3				BOILER PUMP BP-2	8,10,12
13,15,17	RTU-4	S	110 A	3				ELEVATOR 2	14,16,18
19,21,23	RTU-8	2	90 A	3				SPARE	20
25	SPARE		20 A	1				SPARE	24
27	SPARE		20 A	1				SPARE	26
29	SPARE		20 A	1				SPARE	28
31	SPARE		20 A	1				SPARE	30
33	SPARE		20 A	1				SPARE	32
35	SPARE		20 A	1				SPARE	34
37	SPARE		2						

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DIVISION 13 — SPECIAL CONSTRUCTION

- Section 13 34 19 Metal Building Systems
- ADD #3** ~~Section 13 34 23 Pre-engineered Restroom Building~~
- ADD #4** Section 13 34 33 **Environmentally-Controlled Hydroponic Containerized Farming Units**

DIVISION 14 — CONVEYING SYSTEMS

- Section 14 22 00 Compact Traction Elevators

DIVISION 21 — FIRE SUPPRESSION

- Section 21 00 00 Fire Protection

DIVISION 22 — PLUMBING

- Section 22 00 00 Plumbing
- Section 22 08 00 Commissioning of Plumbing

DIVISION 23 — HEATING, VENTILATING AND AIR CONDITIONING

- Section 23 00 00 Heating, Ventilating and Air Conditioning
- Section 23 08 00 Commissioning of HVAC

DIVISION 26 — ELECTRICAL

- Section 26 00 00 Electrical
- Section 26 08 00 Commissioning of Electrical

DIVISION 27 — COMMUNICATIONS

- Section 27 10 00 Structured Cabling
- Section 27 40 00 Audio-Video Communications
- Section 27 50 00 Distributed Communications and Monitoring

DIVISION 28 — ELECTRONIC SAFETY AND SECURITY

- Section 28 00 00 Electronic Safety and Security

DIVISION 31 — EARTHWORK

- ADD #11** Section 31 00 00 Earthwork
- Section 31 10 00 Site Preparation and Clearing
- Section 31 23 19 Dewatering and Drainage
- Section 31 25 00 Erosion Control
- ADD #11** Section 31 60 00 Ground Improvements

DIVISION 32 — EXTERIOR IMPROVEMENTS

- Section 32 00 00 Bituminous Concrete Pavement, Curbing and Edging
- Section 32 12 17 Asphalt for Courts and Tracks
- Section 32 13 12 Site Concrete
- Section 32 13 13 Concrete Paving
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- Section 32 15 40 Crushed Stone Surfacing
- Section 32 17 23 Pavement Markings
- Section 32 17 24 Signs
- Section 32 18 24 Textured Acrylic Color Surfacing
- Section 32 18 25 Synthetic Surface
- Section 32 31 13 Chain Link Fencing and Gates
- Section 32 33 00 Site Furnishings
- Section 32 91 01 Soil Preparation for Lawn Establishment
- Section 32 91 02 Soil Preparation for Rain Gardens

Section 32 91 03	Soil Preparation for Trees and Planting Beds
Section 32 91 04	Soil Preparation for Athletic Fields
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Section 32 93 00	Plants
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DIVISION 33 — UTILITIES

ADD #10	Section 33 05 13	Drainage Manholes and Catch Basins
	Section 33 10 00	Water Distribution
	Section 33 30 01	Sanitary Sewer
	Section 33 40 00	Storm Drainage Systems

APPENDICES

Appendix A	Keynote List
Appendix B	NE-CHPS Project Scorecard
Appendix C	Building Enclosure Commissioning Plan
Appendix D	Hazardous Materials Visual Inspection and Sampling
Appendix E	Geotechnical Report

VOLUME 3 (APPENDIX F)

Appendix F	Environmental Reports and Attachments: Letter of Responsibility Pre-Site Investigation Report & Safe School Siting Act Public Meeting Summary Release Notification Site Investigation Report Phase I Environmental Site Assessment and Limited Subsurface Investigation
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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. [ADD #11]	31 00 00	Cubic Yard (CY)	\$.....	400 CY	\$.....
3. Excavation of open rock removal.	31 00 00	Cubic Yard (CY)	\$.....	100 CY	\$.....
Excavation of Trench Rock Removal [ADD #11]	31 00 00	Cubic Yard (CY)	\$.....	100 CY	\$.....
Containment Impacted Soil – Alternate Cover Soils [ADD #11]	31 00 00	Cubic Yard (CY)	\$.....	3,600 CY	\$.....
Containment Impacted Soil – Solid Waste Soils [ADD #11]	31 00 00	Cubic Yard (CY)	\$.....	700 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

SECTION 01 14 00
ATTACHMENT A
WORKER BCI DISQUALIFICATION MATRIX

Background Check Worker Disqualification Matrix for
Qualifying Central Falls School Construction Projects

Criminal Background Check Criteria	Category 1 (Unoccupied Site)	Category 2 (Adjacently Occupied Site)	Category 3 (Occupied Site)
Sex Offenses: Examples include but are not limited to: child molestation, rape, sexual assault, sexual battery, prostitution, solicitation, indecent exposure, lewd or lascivious act, etc.	Qualified Disqualified [ADD #11]	Disqualified	Disqualified
Non-Violent Felony Offenses: two or more within the past 7 years. Examples include but are not limited to: theft, larceny, embezzlement, fraud, endangerment, trafficking/sale/distribution of narcotics, etc.	Qualified	Qualified	Disqualified
Non Violent Drug Offenses: two or more in the past 7 years including but not limited to possession and use.	Qualified	Qualified	Qualified
Misdemeanor Violence Offenses: no more than three within the past 15 years. Examples include but are not limited to: simple assault, battery, domestic violence, hit & run, etc.	Qualified	Qualified	Disqualified
Five or more misdemeanor and/or felony offenses in the past 15 years.	Qualified Disqualified [ADD #11]	Qualified Disqualified [ADD #11]	Disqualified

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Section 09 84 00
ACOUSTIC ROOM COMPONENTS**PART 1 - GENERAL**

1.1 SUMMARY

- A. Furnish and install interior acoustical panel systems for walls and ceilings, complete with all supporting accessories and associated work required for a complete assembly.
- B. Furnish and install the following:
 - 1. Fabric-covered mineral fiber core panels and mounting accessories.
 - 2. Fabric-covered fiberglass core panels and mounting accessories.
 - 3. Fabric-covered mineral fiber core ceiling baffles.
 - 4. Fabric-covered fiberglass core ceiling baffles.

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 09 51 00 - ACOUSTICAL CEILINGS.
- D. Section 09 91 00 - PAINTING.

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 C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2002a.
 - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
 - 3. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2005.
 - 4. All applicable federal, state and municipal codes, laws and regulations regarding flammability and smoke generation of interior finishes.
- 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 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. 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. Product Data: For each type of product indicated.
2. Shop drawings: Show fabrication and installation details for acoustical wall panels, including plans, elevations, sections, details, and attachments to other work.
 - a. Show orientation of fabric application, pattern matching, and seams.
3. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors, textures, and pattern available for facing materials for each type of acoustical wall panel indicated. Include samples of installation devices and accessories.
4. Samples for Verification: 8-by-11 inch (200 by 280 mm) units of each type of acoustical wall panel indicated; in sets for each color, texture, and pattern for facing materials, showing the full range of variations expected in these characteristics. Include samples of installation devices and accessories.
5. Product Certificates: Signed by manufacturers of acoustical wall panels certifying that products furnished comply with requirements.
6. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
7. Product Test Reports: From a qualified testing agency indicating acoustical wall panels comply with requirements, based comprehensive testing of current products.
8. Manufacturer's Instructions: Written installation instructions.
9. Sustainable Design Submittals: As required by NE CHPS.
10. Qualification Submittals.

B. Closeout Submittals: Submit the following under provisions of Section 01 78 00 - CLOSEOUT SUBMITTALS.

1. Maintenance Data: For acoustical wall panels and facings to include in maintenance manuals specified in division.
2. Operation and Maintenance Data:
3. Bonds and Warranty Documentation:
 - a. Manufacturer's Warranties and Guarantees as specified elsewhere herein this Section.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing acoustical wall panels similar to those indicated for this Project and with a record of successful in-service performance.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E548.
- C. Source Limitations for Acoustical Wall Panels: Obtain acoustical wall panels from one source with resources to provide products of consistent quality in appearance and physical properties.
- D. Fire-Testing Response Characteristics: Provide acoustical wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical wall panels with appropriate markings of applicable testing and inspecting agency.
 1. Flame Spread: 25 or less.
 2. Smoke Developed: 450 or less.
- E. Mockups: Before installing acoustical wall panels, build mockups for each form of construction and finish required to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build Mockups to comply with the following requirements, using materials indicated for the completed Work:
 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's approval of mockups before starting acoustical wall panel fabrication.
 5. Maintain mockups during construction in an undistributed condition as a standard for judging the completed work.
 6. Demolish and remove when directed.
 7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial completion.

1.7 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. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
- B. Storage and Handling Requirements:
1. Store and handle materials following manufacturer's recommended procedures, and in accordance with safety data sheets.
 2. Protect materials from damage due to moisture, direct sunlight, excessive temperatures, surface contamination, corrosion and damage from construction operations 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.
- 1.8 PROJECT CONDITIONS
- A. Environmental Limitations: Do not install acoustical wall panels until construction in spaces in complete and ambient temperature and humidity conditions are maintain at the levels indicated for Project when occupied for its intended use.
- B. Air-Quality Limitations: Protect acoustical wall panels from exposure to airborne odors, such as tobacco smoke, and install panels under conditions free from color contamination of ambient air.
- C. Field Maintenance: Verify wall surface dimensions by field measurements before fabrication and indicated measurements on Shop Drawings. Coordinate fabrication schedule with coordination progress to avoid delaying the Work.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, established surface dimensions and proceed with fabricating acoustical wall panels without field measurements. Coordinate wall construction to ensure that actual surface dimensions correspond to establish dimensions.
- 1.9 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.
- B. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties make by Contractor under requirements of the Contract Documents.
- C. Special Warranty: Written warranty, signed by manufacturer agreeing to repair or replace components of acoustical wall panel system that fail in performance, materials, or workmanship within specified warranty period. Failure in performance

includes, but is not limited to, acoustical performance. Failure in materials includes, but is not limited to, sagging or distortion of facing or warping of core.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Specified Manufacturer: To establish a standard of quality, design and function desired, Drawings and specifications have been based on the products and materials specified in the following Articles.
- B. 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. Sound Concepts Canada, Inc., Manitoba, Canada
 2. AVL Systems Inc., Ocala, FL.
 3. Conwed Corporation, Ladysmith, WI.
 4. Corporate Acoustic Systems, Poughkeepsie, NY.
 5. Decoustics, Etobicoke, Ontario, Canada.
 6. Martin Acoustical Products, Bogart, GA.
 7. Tectum Inc., Newark, OH.
 8. Wenger Corporation, Owatonna, MN.
 9. Koroseal Interior Products Group, Fairlawn, OH.

2.2 ACOUSTICAL WALL PANELS

- A. Wall acoustical panels, **fabric wrapped, Type ~~xx~~ Type 1** (Student Commons, Auditorium, Band, Music, and Gymnasium and Chorus). **[ADD #11]**
1. Basis of Design: HIR (high impact resistant) Reflect panels by Sound Concepts or approved equal.
 2. Panel thickness: 2 inches
 3. Panel width: Custom, as indicated.
 4. Panel core: 7 lb./ft.3 density rigid fiberglass core board with chemically-hardened (resin) edges and an acoustical reflective facer fused to core.
 5. NRC rating: 0.90 minimum.
 6. Panel finish: Guilford of Maine, pattern "FR701", in colors selected by Architect from fabric manufacturer's full range of colors..
 7. Panel edge: Square
 8. Mounting style: Concealed "Z" clip.
 9. Colors: As selected by the Architect from the manufacturer's full range of available colors.
- B. Wall acoustical panels, **fabric wrapped, Type ~~xx~~ Type 2** (Band, Music, and Auditorium and Chorus). **[ADD #11]**
1. Basis of Design: LFT (low frequency tuner) panel by Sound Concepts or approved equal.
 2. Panel thickness: 2 inches.
 3. Panel width: Custom, as indicated.

4. Panel core: 7 lb./ft.3 density rigid fiberglass core board with chemically-hardened (resin) edges.
5. Panel finish: Vinyl covered, manufacturer's standard in color/pattern selected by Architect.
6. Panel edge: Square.
7. Mounting style: Concealed "Z" clip.

~~C. Wall acoustical panels, Type xx (Auditorium and Student Commons).~~

- ~~1. Basis of Design: HIR (high impact resistant) Reflect panels by Sound Concepts or approved equal.~~
- ~~2. Panel thickness: 1 inch.~~
- ~~3. Panel width: Custom, as indicated.~~
- ~~4. Panel core: 7 lb./ft.3 density rigid fiberglass core board with chemically-hardened (resin) edges and an acoustical reflective facer fused to core.~~
- ~~5. NRC rating: 0.90 minimum.~~
- ~~6. Panel finish: Guilford of Maine, pattern "FR701", in colors selected by Architect from fabric manufacturer's full range of colors.~~
- ~~7. Panel edge: Square~~
- ~~8. Mounting style: Concealed "Z" clip.~~
- ~~9. Colors: As selected by the Architect from the manufacturer's full range of available colors.~~

[ADD #11]

C. Wall acoustical panels, felt panel, Type 1 (double layer panel): (CTE Community Law & Advocacy)

- 1. Basis of Design: MDC Wallcoverings, Glendale Heights, IL, "Zintra" acoustical panels or approved equal.**
- 2. Panel thickness: 1/2 inch**
- 3. Panel width: As indicated.**
- 4. Panel core: 100 percent polyester.**
- 5. NRC Rating: 0.80 minimum.**
- 6. Panel finish: Matte.**
- 7. Panel edge: Square edge.**
- 8. Mounting style: blocking to be installed by Section 06 20 00 – Finish Carpentry.**
- 9. Colors: As selected by the Architect from the manufacturer's full range of available colors.**

D. Wall acoustical wood fiber panels, Tectum Wall Panel, Type 1: (Gymnasium)

- 1. Basis of Design: Armstrong "Direct-Attach Tectum" panels or approved equal.**
- 2. Panel thickness: 2 inches.**
- 3. Panel width: As indicated.**
- 4. Panel core: Aspen wood fibers bonded with inorganic hydraulic cement.**

5. **Panel finish: Painted, manufacturer's standard in color/pattern selected by Architect.**
6. **Panel edge: Beveled.**
7. **Mounting style: Concealed "Z" clip.**
[ADD #11]

~~2.3 CEILING MOUNTED ACOUSTICAL WOOD FIBER PANELS~~

~~A. Ceiling Acoustical Panel Type xx:~~

- ~~1. Basis of Design: Wenger Pyramidal Ceiling diffuser, clip model.~~
- ~~2. Panel thickness: 6 inches.~~
- ~~3. Panel size: 24 by 24 inches.~~
- ~~4. Panel core and finish: Manufacturer's standard construction of thermo-molded plastic, 0.125" (3mm) material thickness with white "lemon peel" finish.~~
- ~~5. Mounting: Hook mounting is attached to panel edges at each corner; panels are suspended by wire to ceiling.~~

[ADD #11]

2.3 CEILING MOUNTED ACOUSTICAL WOOD FIBER PANELS

A. Tectum Ceiling Panel, Type 1: Gymnasium

1. **Basis of Design: Armstrong "Direct-Attach Tectum" panels or approved equal.**
2. **Panel thickness: 2 inches.**
3. **Panel width: As indicated.**
4. **Panel core: Aspen wood fibers bonded with inorganic hydraulic cement.**
5. **Panel finish: Painted, manufacturer's standard in color/pattern selected by Architect.**
6. **Panel edge: Beveled.**
7. **Mounting style: Refer to Section 09 51 00 – Acoustical Ceiling for mounting details.**

2.4 WALL MOUNTED DIFFUSER PANELS (BAND AND CHORUS)

A. Basis of Design (Specified Manufacturer): To establish a standard of quality, design and function desired, Drawings and specifications have been based on Kinetics Noise Control, Inc, Product: " Geometric Diffuser Sound-Diffusing Panel".

B. Geometric Diffuser Sound-Diffusing Panel, Type 1:

1. **Constructed from 0.125 inch (3.2 mm) thermo-molded copolymer.**
2. **Size and shape:**
 - a. **Nominal 2 feet x 2 feet x 6.75 inches (610 x 610 x 171 mm) offset pyramidal.**
3. **Edge Detail: Rounded pencil edge thermo-molded frame formed on a geometric radius or offset pyramidal shaped unit.**
4. **Finish: Fabric facing: Manufacturer's standard 100% polyester woven fabric, FR701 Style 2100 by Guilford of Maine.**

5. **Colors: As selected by Architect from manufacturer's full range of colors.**
6. **Sound Absorption (ASTM C423): Noise Reduction Coefficient shall be no greater than 0.10 for Type A Mounting (direct mount).**
7. **Mounting: Wall mount with top of panel angle and Z-clip.**
[ADD #11]

2.42.5 FABRICATION

- A. Fabricate panels to sized and configurations indicated; where required, attach facing materials to cores to produce installed panels with visible surfaces fully covered and free from waves in fabric weave, wrinkles, sage, blisters, seams, adhesive, or other foreign matter.
 1. Fabricate back-mounted panels in factory to exact sized required to fit wall surfaces, based on field measurements of completed substrates indicated to receive acoustical wall panels.
 2. Where square corners are indicated, tailor corners.
 3. Where fabrics with directional or repeating patterns, or directional weave, are indicated, mark fabric top and attach fabric in same direction.
 4. Where fabric facings with seams are indicated, fabricate invisible seams and comply with Shop Drawings for location.
 5. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
 6. For panels suspended from ceiling, provide fabric covering both sides, with seams only at panel edges.

2.52.6 ACCESSORIES

- A. Spline-Mounting Accessories: Manufacturer's standard concealed connecting splines of extruded aluminum or plastic designed for screw attachment to walls, with coordinating moldings and trim for interior and exterior corners and miscellaneous conditions.
 1. Color of Exposed Trim: As selected from manufacturer's standards; to match fabric.
- B. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
 1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.
 2. Metal impaling clips designed to support full weight of panels, mechanically attached to substrate and adhesively bonded to back of panels.
 3. Hook and loop strips adhered to substrate and to back of panels.
 4. Z-clip hanger and magnet system with magnets recessed into panel frame and designed to engage steel mounting plates secured to substrate with screws.
 5. Mechanically Mounted Metal-Framed Panels: Metal panel-clip system designed to engage metal framing of panels.

- C. Ceiling-Suspended Accessories: Manufacturer's standard through-threaded eyelets bolted through concealed perimeter frame at 1/4 points; locations indicated on each panel, sized appropriately for weight of panels.
 - 1. Provide galvanized wire; galvanized chain for suspension from ceiling at heights indicated.
- D. Trim Moldings: Manufacturer's standard wood or vinyl trim moldings for concealing panel joints; color as selected from manufacturer's standards.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and blocking with Installer present, for compliance with requirements for installation tolerances and other conditions affecting acoustical wall panel performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install acoustical panels in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- B. Suspend ceiling baffles at locations and heights indicated.
- C. Install panels to the following construction tolerances:
 - 1. Plumb and level: plus or minus 1/16 inch.
 - 2. Flatness: plus or minus 1/16 inch.
 - 3. Width of joints: plus or minus 1/16 inch.

3.3 CLEANING

- A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.
- C. Clip loose threads; remove pills and extraneous materials.

3.4 PROTECTION OF FINISHED WORK

- A. Provide protection of installed acoustical panels until completion of the Work.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect, before time of substantial completion.

End of Section

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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 as needed 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 **as shown on the drawings.**
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. **The foundations and slab of the proposed building, retaining walls, and utility structures, and designated utilities (as described in Section 31 60 00 and shown on the Drawings) shall be supported on ground improved using Aggregate Piers/Rigid Inclusions. Where ground improvements are installed, the existing fill and underlying organic soil shall be removed above the top of the ground improvements.**
- ~~7-8.~~ Improving the existing fill under the subbase of paved areas and proposed athletic fields.
- ~~8-9.~~ Screening and stockpiling the topsoil for reuse as directed by the Architect.
- ~~9-10.~~ Performing test pits before start and during construction as required by the Geotechnical Engineer.
- ~~10-11.~~ Removing and disposing of spoiled material not suitable for fill from the site. No burning on the site shall be permitted.
- ~~11-12.~~ 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.
- ~~12-13.~~ Furnishing, placing, and compacting fill materials.
- ~~13-14.~~ Removing, hauling, stockpiling, rehandling, and placement of materials. Over-excavation to remove unsuitable materials.
- ~~14-15.~~ Proofrolling of exposed subgrade for fill, footings, foundations, slabs, walks, pavements, lawns and grasses, and exterior plants.
- ~~15-16.~~ Backfilling of excavations for foundations, footings, walls, utilities, pavements, sidewalks, and landscaped areas with specified on-site and imported materials.
- ~~16-17.~~ Disposing off-site of excess or unsuitable materials.
- ~~17-18.~~ Placing bedding, sub-base and base course layers.
- ~~18-19.~~ Stabilizing/mitigating of saturated or otherwise disturbed materials.
- ~~19-20.~~ Performing rough and final grading.
- ~~20-21.~~ Filling slopes and site retaining walls.
- ~~21-22.~~ Installing excavation support, shoring or bracing as necessary
- ~~22-23.~~ Protecting existing buildings, utilities, roads, pavements, lawns, planting and other improvements from damage due to construction.

~~23-24.~~ 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.

~~24-25.~~ Performing material testing, and field density testing as needed.

~~25-26.~~ Performing dust control and cleanup.

~~26-27.~~ Dewatering.

~~27-28.~~ Installing fencing and safety devices or controls as specified and as necessary.

29. Notifying all affected utility companies and Dig Safe before the start of work.

30. Laying out ground improvement locations using survey equipment.
[ADD #6]

~~28-31.~~ 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]**
- ~~40-11.~~ Section 32 13 123, Site Concrete **[ADD #7]**
- ~~44-12.~~ Section 33 40 00 Storm Drainage Systems
- ~~42-13.~~ Division 01 Section "Unit Prices"
- ~~43-14.~~ Division 01 Section "Temporary Tree and Plant Protection"
- ~~44-15.~~ Division 31 Section "Trench Excavation and Backfill" **[ADD #7]**
- ~~45-16.~~ Division 31 Section "Dewatering"
- ~~46-17.~~ Division 32 Section "Turf and Grasses"
- ~~47-18.~~ 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] [ADD #7]**

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. Handling, 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/	Contractor	Source	Grain Size through 0.002 mm	1 per source
		Investigation	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

Common Borrow/ Bedding Material/ Crushed Stone / Pea Gravel	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 Specific Gravity	1 per source 1 per source
	Contractor	During Placement	Source Material Certification Specific Gravity	1 per 500 tons 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 be 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 in 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 ~~4 feet~~ **6 inches** 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 contents 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:

<u>Sieve Size</u>	<u>% Passing by Weight</u>
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
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

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value
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. **The existing fill at the site is loose and contains traces of organic soil, asphalt, brick, roots, glass, trash, wood, and nails. The presence of such existing fill and/or organic soil shall not be considered an unanticipated condition.** ~~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.~~
 - 4.2. 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.

- 5-3. 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. **It is assumed that all unsuitable soils will meet RI Resource Recovery Corporation's (RIRRC) criteria for Alternate Cover Soils and will be disposed at a regulated facility.**- 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-Contaminant Impacted~~ **Soil Allowance:** The Contractor shall carry in the ~~Base bid an allowance for 3,600~~ **Base Bid an allowance for 700 cu. yds. of contaminant impacted soil removal and disposal for materials which exceed RIRRC's criteria for Alternate Cover Soils, but meet RIRRC's criteria for Solid Waste Soils.** Allowance shall ~~cover removal and~~ **include removal off site and disposal of such petroleum-contaminated-contaminant impacted soil. As required by the project's RAWP, existing on-site soils shall only be reused below the minimum capping requirements, when meeting gradation requirements. Excess soil which cannot be reused below the cap shall be removed and disposed at a regulated facility. -and-The allowance excludes excavation, loading, stockpiling, testing, 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 ~~quantity~~ **quantity** of unanticipated petroleum contaminated ~~contaminant impacted~~ **contaminant impacted** 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~~ **removal and disposal** at the unit price submitted in the Bid Attachment – Unit Prices Schedule.
 2. If the **total quantity of contaminant impacted material** ~~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 **removal and disposal** ~~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 ~~20-100~~ cubic yards of rock encountered in trench excavation removed from the site. The Contractor shall also carry in the Base Bid an allowance of ~~20-100~~ 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. 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 devices. 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 CONTROL

- 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	95%
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 **the following**:
1. **All building foundations and slabs;**
 2. **All stairs, access ramps, retaining walls, and sidewalks attached/connected to buildings;**
 3. **All utility structures, including catch basins, manholes, transition chambers, area drains, water treatment practice structures and underground vaults of any type;**
 4. **All concrete pads;**
 5. **Full length of all 48" pipe;**
 6. **Full length of all culverts and associated wingwalls;**
 7. **18" drain pipe from DMH-304 to DMH-313 (DMH identification provided on the civil drawings); and**
 - ~~A.8. 24" drain pipe from DMH-317 to DMH-313 (DMH identification provided on the civil drawings). 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 **the following**:
1. **All building foundations and slabs;**
 2. **All stairs, access ramps, retaining walls, and sidewalks attached/connected to buildings;**
 3. **All utility structures, including catch basins, manholes, transition chambers, area drains, water treatment practice structures and underground vaults of any type;**
 4. **All concrete pads;**
 5. **Full length of all 48" pipe;**
 6. **Full length of all culverts and associated wingwalls;**
 7. **18" drain pipe from DMH-304 to DMH-313 (DMH identification provided on the civil drawings); and**

~~D-8. 24" drain pipe from DMH-317 to DMH-313 (DMH identification provided on the civil drawings), 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~~ **the following:**
1. **All building foundations and slabs;**
 2. **All stairs, access ramps, retaining walls, and sidewalks attached/connected to buildings;**
 3. **All utility structures, including catch basins, manholes, transition chambers, area drains, water treatment practice structures and underground vaults of any type;**
 4. **All concrete pads;**
 5. **Full length of all 48" pipe;**
 6. **Full length of all culverts and associated wingwalls;**
 7. **18" drain pipe from DMH-304 to DMH-313 (DMH identification provided on the civil drawings); and**
- ~~A-8. 24" drain pipe from DMH-317 to DMH-313 (DMH identification provided on the civil drawings).~~
- 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.

- G-H. The specialty subcontractor shall review the drawings, including the phasing drawings, to become familiar with the construction phases, and shall include the required number of mobilizations of the ground improvement equipment.**

1.04 RELATED SECTIONS

- A. Related Sections include the following:
1. Division 00 Section "Available Project Information"
 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."

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 Massachusetts.
 - 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 Massachusetts.
 - 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 Massachusetts.
 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 Massachusetts.
- 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 3/4 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 Designer (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. **There shall be no separate payment for pre-augering.**
- 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 rigid 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 recompact 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 SMMA Project Management, KAN.
- 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.

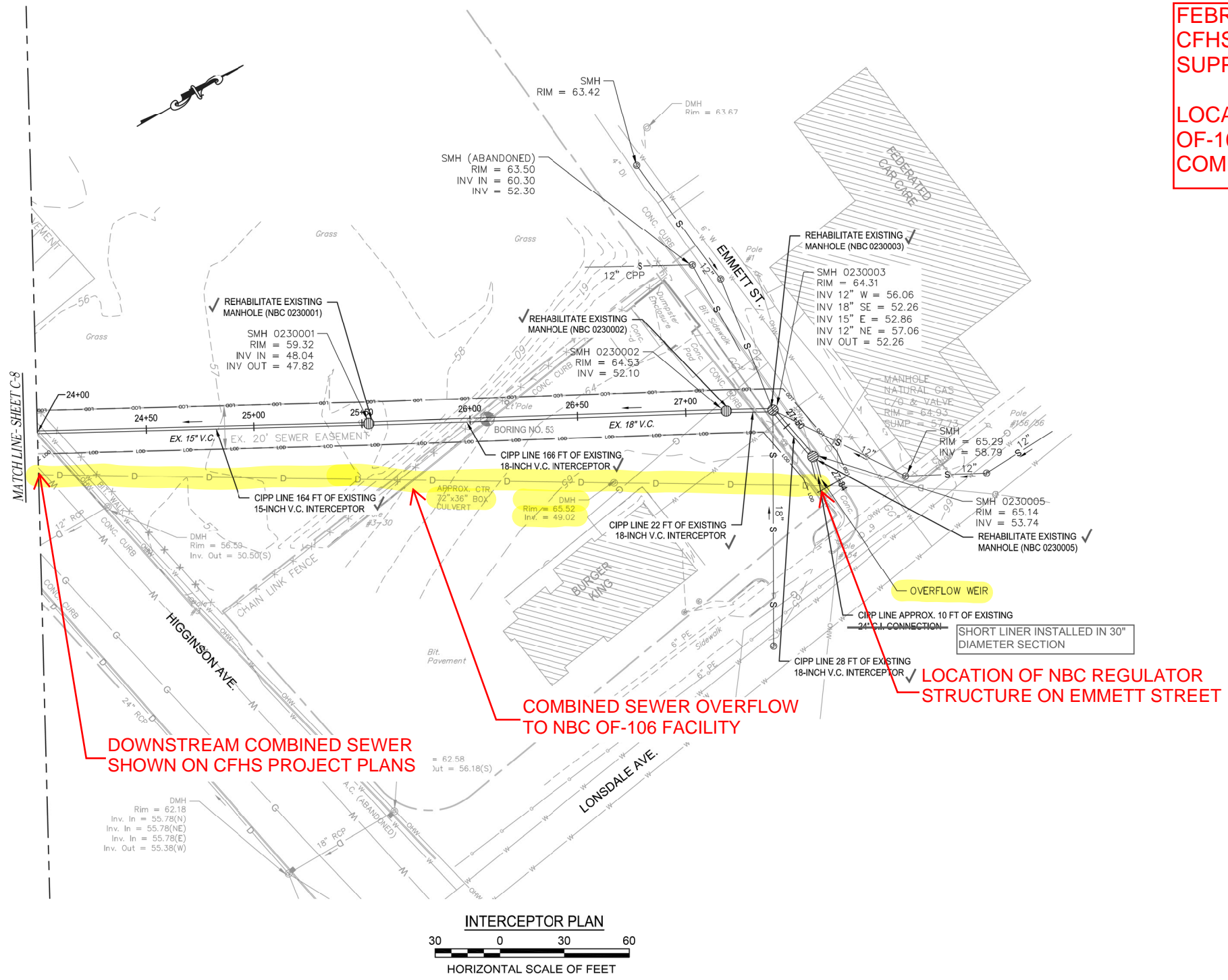
- 1. Unit Price for additional installed aggregate piers or rigid inclusion (w/o remobilization):
\$ _____ Lump Sum
- 2. Unit Price Credit for aggregate piers or rigid inclusion not installed:
\$ _____ Lump Sum
- 3. Unit Price for additional Modulus Tests (w/o remobilization):
\$ _____ Lump Sum
- 4. 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

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**FEBRUARY 13, 2024
CFHS ADDENDUM 11
SUPPLEMENTAL INFORMATION**

LOCATION OF UPSTREAM COMBINED SEWER TO NBC OF-106 FACILITY AS SHOWN ON NARRAGANSETT BAY COMMISSION (NBC) PLAN.



- NOTES:**
1. MAINTAIN ACCESS TO PRIVATE DRIVEWAYS AT ALL TIMES.
 2. MAINTAIN ACCESS TO BUILDINGS AT ALL TIMES.
 3. MAINTAIN CLEARANCE WITH OVERHEAD WIRES.
 4. CIPP LINING OPERATIONS MAY BE DONE DURING OFF PEAK HOURS.
 5. AREAS SHALL BE FULLY RESTORED TO THE CONDITION PRIOR TO CONSTRUCTION.
 6. DISTURBED LANDSCAPED AREAS WITHIN LIMITS OF DISTURBANCE SHALL RECEIVE 6\"/>

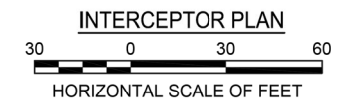
MANHOLE REHABILITATION TABLE

MANHOLE NUMBER	DEPTH (FEET)	CONNECTIONS (DIAMETER, LOCATION)
NBC O230005	11.4	24 INCH, EAST 18 INCH, WEST
NBC O230003	12.1	12 INCH, NORTHEAST 12 INCH, WEST 18 INCH, SOUTHEAST 18 INCH, EAST 18 INCH, SOUTHWEST
NBC O230002	12.4	18 INCH, NORTH 18 INCH, SOUTH
NBC O230001	11.5	18 INCH, NORTH 15 INCH, SOUTH

DOWNSTREAM COMBINED SEWER SHOWN ON CFHS PROJECT PLANS

COMBINED SEWER OVERFLOW TO NBC OF-106 FACILITY

LOCATION OF NBC REGULATOR STRUCTURE ON EMMETT STREET



8/31/23 MKRACOV: I:\PROJECTS\01\DATA\PROJECT\2008 NBC CENTRAL FALLS MM REPAIR\DRAWINGS\DWG\C8_2017.DWG C-9 XREFS: ; XR-TBLOCK; XR-MAPPING GRID; XR-FINAL SURVEY; WITH OF 106 CHANGES; MK-DESIGN-FILE; XR-NEW-OF 106 TOPO; 2013-06-20; XR-6779-PROP; GAROFALO SRUVEY LINES-REVISED; 6-05-2013; XR-AMICO SITE PLAN; SEED;

NUMBER	DATE	MADE BY	CHECKED BY	REVISIONS DESCRIPTION
	7/18	MK	CC	NO CHANGES

THE NARRAGANSETT BAY COMMISSION

COMBINED SEWER OVERFLOW CONTROL FACILITIES PROGRAM

The LOUIS BERGER GROUP, Inc.

CLAYTON A. CARLISLE

No. 5803

REGISTERED PROFESSIONAL ENGINEER

JANUARY 2018

DATE

DRAWN BY:
M. KRACOV

DEPT CHECK:
C. CARLISLE

PROJECT CHECK:
T. PAYNE

MOSHASSUCK VALLEY INTERCEPTOR
CENTRAL FALLS BRANCH REPLACEMENT

**MOSHASSUCK VALLEY
INTERCEPTOR PROPOSED WORK
PLAN 5 OF 5**

CONTRACT No.
304-44C

C-9

SHEET
11 OF 32